
AQHED-SL

Learning assessment for critical thinking skills – collection of information

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Introduction

This document provides information about learning assessment related to critical thinking skills. It consists of two parts. The first part provides information from a desk research about methods and tools of learning assessment; the second part provides thoughts around learning assessment that have been collected by the members of the critical thinking task force.

The focus is on formative assessment rather than summative assessment, since formative assessment seems to be the more important way of assessment to support students' learning but also to assist lecturers learning about the new teaching & learning approach since they get an immediate feedback whether the students have understood the new concepts and if their learning was found useful.

“I think formative assessment is a better option considering the newness of the critical thinking concept on our end. It will help us to learn and adjust the methods of delivery accordingly. Summative assessment could serve as a means to actually test the tools fully.”

(Jeremiah Harding, task force member)

The following information about criteria of good learning assessment and recommendations for actions is derived from the literature which is listed at the end of this document.

Criteria of ‘good’ learning assessment

See Duron, Limbach and Waugh 2006

Focus on formative assessment with the following desired attributes to support learning

- Ongoing; frequent opportunities; timely
- Based on agreed-upon standards; helping students to understand what the criteria and standards are and what they mean
- Specific and context aware; to fit the subject matter and the needs of the learners
- Constructive; positively perceived; providing corrective advice; including praise
- Limiting the amount of feedback; not overwhelming
- Differential; help students learn to distinguish between satisfactory and unsatisfactory performance; indicating personal improvement since the last performance
- Learner-centred; informational rather than controlling
- Directing students to higher order learning skills (e.g. critical thinking)
- Giving the learners a pro-active role in their learning assessment; students setting their own goals
- Facilitated self- and/or peer-assessment besides teacher feedback
- Sustainable; basis for students to undertake their own assessment activities in the future; to support lifelong learning activities

Recommendations for actions around formative assessment

- Check existing assessment practices to examine whether they support critical thinking and learning
- Build a criterion- or standards-based framework – each student’s performance measured based on an acceptable standard rather than against other students’ performance in the same cohort. Consider including students’ ideas when setting up such a framework
- Discuss with the students the purpose of (formative) learning assessment and how it will be done. Clarify criteria, standards and goals.
- Strengthen students own evaluative skills so that they can perform self- and peer assessment – students must know what good performance is; be able to compare their current performance against the good performance standard; understand how to act to close the gap between current and good performance
- Teachers need to work on their attitude – they need to be able to believe that all students can succeed; if this is not a valid assumption then the intake or the course must change. Admitting students and assuming they will not succeed, creates a climate not conducive to learning
- Encourage students to believe in their own abilities
- Design assessment activities that focus on the learning task rather than the performance
- Consider the separation of feedback from grading – marks can be a barrier for students’ learning
- Facilitate self- and peer-assessment; help students to define learning goals; help students recognise external clues they can use to give feedback to themselves; develop tools for self- and peer assessment
- Encourage students to use feedback to check their goals and improve
- Provide opportunities to close gaps
- Encourage the view that mistakes are a part of learning
- Use learning assessment to adjust teaching

Learning can and often does take place without the benefit of teaching – and sometimes even in spite of it – but there is no such thing as effective teaching in the absence of learning. Teaching without learning is just talking.

(taken from Classroom Assessment Techniques: A Handbook for College Teachers, 2nd edition by Thomas A. Angelo & K. Patricia Cross)

Learning assessment methods

Questioning & listening

Questions with the following characteristics help the teacher to observe, whether critical thinking is taking place

- Open
- Non-technical
- Novel to the students
- Ambiguous
- Requiring the students to identify missing or limited information, defend their positions and recommendations, or questioning assumptions

The minute paper

The minute paper is a special method of questioning. The lecturer asks students to write down the answers to some questions around their learning at the end of class or the end of a topic, giving one or two minutes time. The answers provide rapid feedback whether the students' learning matches with the intended learning outcomes.

Sample minute paper questions:

- What are the two most useful things you have learned during this session? [You can also ask for the most meaningful, surprising, or disturbing things.]
- What question(s) would you like to ask about the lesson contents?
- Is there anything you did not understand?

You can ask one or several questions and adjust questions to your subject. The second question could help you in particular to find out whether students are engaging with critical thinking. Are they able to ask meaningful questions, perhaps even challenging the lecturer?

The lecturer will collect the answers, read them and discuss them in the next lesson. If you want to focus on critical thinking, pick answers that are related to learning about critical thinking or to more challenging questions. Discussions can also happen on an individual basis.

There is also a variant of the minute paper where a question is asked at the beginning of a lesson and followed up at the end.

A sample question at the beginning of the lesson could be:

- Thinking of the [topic X], what question would you like to ask?

And the corresponding question at the end of the lesson:

- What question remains uppermost in your mind now at the end of this teaching session?

Observing behaviour

Observing behaviour, e.g. when students deliver presentations or have group discussions, can help you to find out whether they engage in critical thinking.

Pro & con grid

Ask students to write the pros & cons of a given issue. This helps to assess whether the student has understood the issue. Sharing the results with the class initiates discussion.

Application cards

Ask students to write down one possible, real-world application of what they have just learned. So, students connect newly learned concepts with prior knowledge and see the relevance of what they are learning.

Examples can be shared. Consider sharing in small groups to encourage also shy or quiet students.

Classroom opinion polls at the beginning and the end of the lesson

To determine whether and how students' opinions have changed through learning.

Sharing the results with the class initiates discussion.

Can be supported through e-learning tools such as Mentimeter.

Rubrics

Good description with example in [Andrade 2000](#)

Two features

- List of criteria, or "what counts" in a project or assignment
- Gradations of quality, describing levels of quality

Benefits

- Easy to use and to explain
- Making expectations of what students should learn / have learned very clear
- Clear and informative feedback about students strengths and areas in need of improvement
- Can be used as students' self- or peer-assessment tool
- Supporting learning, understanding, critical thinking and the development of skills – there is evidence based on studies

Instructional rubrics

Rubrics can be produced within a classroom activity, based on good/bad examples of work. See [Andrade 2000](#) how to do that. In this way, the students learn and understand how they should do their work and what counts as good or bad work.

Self-assessment scale for active learning and critical thinking (SSACT)

By Umatul Khoiriyah et al (2015); the SSACT was developed and evaluated in the academic year 2013–2014 at the Faculty of Medicine, Islamic University of Indonesia (FM IUI), which employs problem-based learning (PBL) in the pre-clinical phase (year 1–4) of a 6 year course. The scale is tailored to the university's PBL tutorial setting but could serve as an example; at least parts of it seem so generic that they could be adopted and adjusted to the needs of other universities and settings too.

The scale covers two aspects of self-assessment about problem-based learning (PBL):

- Active learning - consisting of collaborative learning (e.g. item no 5) and self-directed learning processes (e.g. item no 1–4, 6)
- Critical thinking - including skills in organizing ideas, in explaining and questioning, and in paraphrasing where students need to understand the information first before they explain

The scale consists of 14 Items which the students need to rate using a 7-point Likert scale (1 = 'not very true of me' to 7 = 'very true of me'). There are items more related to active learning and others more related to critical thinking. However, the authors of the scale point out that the two aspects are interrelated. "Critical thinking is a self-directed process to assist connecting new knowledge to prior knowledge. Students need to justify their new understanding through sharing with others. On the other hand, self-directed learning referred to students' internal cognitive processes in managing their learning in order to achieve their learning goals. To be self-directed learners, students need to think critically regarding their own learning condition (Umatul Khoiriyah et al 2015)."

Items related to active learning

1. I set my own learning objectives for each scenario, in addition to the group objectives.
2. I applied various learning strategies during independent study.
3. I was able to summarize the key points of the outcome of the group discussion.
4. I managed my independent study effectively.
5. My behaviour encouraged other members to actively participate in the tutorial process.
6. I reflected on my learning in each scenario based on the objectives that I set myself.

Items related to critical thinking

7. I was able to formulate questions based on the scenario.
8. I communicated my ideas clearly.
9. I performed the role given to me by other group members.
10. In the second meeting, I applied knowledge from my independent study to provide a solution to the problem being discussed.
11. I analysed information in the scenario using relevant theory and concepts.
12. I made links during the tutorial process between my newly acquired knowledge and my previous knowledge.
13. I explained knowledge from the resources in my own words.
14. I could generate a hypothesis to explain the problem under discussion.

Involving students in assignment feedback form

You can ask students to specify, when submitting assignments, what feedback they want to have. Give them some criteria they can select or let them identify where they had difficulties in preparing the the assignment.

Tools to support learning assessment

Tools to create rubrics

Moodle

Moodle provides a tool to create rubrics as part of assignment grading. The created rubrics can be saved as templates for re-use. That would allow us to build a rubric collection around critical thinking,

also integrating gender-responsive pedagogy / diversity aspects, which can be shared with all lecturers among the AQHEd partners.

In edit mode, Moodle users can be assigned a role that allows them to grade the learners' assignments. A workflow process can be defined so that the assignments to be graded will go through a series of workflow stages before being released to students. This allows for multiple rounds of gradings and allows the graded assignments to be released to all students at the same time. The workflow process also allows that assignments can be allocated to particular persons for grading. In this way, Moodle can also be utilized for peer-assessment.

Steps to create a rubric:

- Create an assignment on the Moodle course dashboard: Turn editing on; click on 'Add an activity or resource'; select and add 'Assignment'
- Specify the grading method 'Rubric': Edit the assignment activity; select under 'Grade' the grading method 'Rubric' and save the assignment specification
- Produce the rubric: Click on the assignment; in the administration block, select 'Advanced grading' and click on 'Define rubric'; give it a name and describe the purpose; now you can add 'criteria' and 'levels' (=gradations of quality).

Please see below an example of a rubric, created with Moodle for one of the online course activities. Please note that each gradation of quality is rated by points but there is the option of hiding the points from the grading persons as well as the learners.

Rubric 'Tackling a complex argument' Draft

To assess learning related to Unit 6 of the critical thinking online course. Practical activity 'Tackling a complex argument'. The rubric assesses the quality of the student's reflection on the given text.

1. Key questions and text purpose	No valid key questions have been identified; the text purpose hasn't been described comprehensibly 0 points	One valid key question is included or the text purpose is described comprehensibly 1 points	One valid key question is included and the text purpose is described comprehensibly; or several valid key questions are included 2 points	Several valid key questions are included and the text purpose is described comprehensibly 3 points
2. Claims analysis	No claims in the text have been identified 0 points	One or two claims have been identified without analyzing the support through the premises 1 points	More than 2 claims have been identified without analyzing the support through the premises; or a comprehensible analysis of how the premise(s) support the claim is included for only one claim 2 points	A comprehensible analysis of how the premise(s) support the claim is included for at least two claims 3 points
3. Facts & opinions	No valid explanation for any information piece in the text whether it's a fact or opinion 0 points	Valid explanation for at least one information piece in the text why it's a fact or opinion without description of how it supports the author's ideas 1 points	Valid explanation for at least one fact or one opinion and description of how it supports the author's ideas; or valid explanation for at least one fact and one opinion without description of how it supports the author's ideas 2 points	Valid explanation for at least one fact and one opinion and description of how it supports the author's ideas 3 points
4. Perspectives and biases	No valid assumptions have been identified 0 points	At least one valid assumption has been identified 1 points	The author's point of view or at least one bias is explained comprehensibly 2 points	The author's point of view and at least one bias is explained comprehensibly 3 points
5. Logical implications	No logical implications have been explained comprehensibly 0 points	One logical implication for either following or not following the author's line of reasoning is comprehensibly explained 1 points	Several logical implications for either following or not following the author's line of reasoning are comprehensibly explained 2 points	At least one logical implication for following and at least one for not following the author's line of reasoning are comprehensibly explained 3 points
6. Relevance of the author's points	No reflection on the relevance of the author's points 0 points	It's explained comprehensibly why or why not the author answers the text's question but without referring to single points in the author's reasoning 1 points	It's explained comprehensibly why or why not the author answers the text's question by referring to single points in the author's reasoning 2 points	Several single points in the author's reasoning are discussed in detail by explaining how far they are relevant to the text's question or not 3 points

Rubistar

In the internet, you can find other tools that support the creation of rubrics. One example is <http://rubistar.4teachers.org>

Rubistar provides templates of rubrics around different themes ('Customizable Rubrics'). The user selects a template and can choose which categories it should include. Registered users can save and edit the rubrics online. Registration and use of this tool are free. Although Rubistar addresses mainly school teachers, the tool seems to be generic enough that it can be also useful in Higher Education. There is a short tutorial that will help you using the tool.

Below is a Rubistar screenshot with a rubric example around the pre-defined theme 'Reading - Analyzing Information'. The user can select categories (such as 'Identifies facts') and text for gradations of quality. The pre-defined text for the categories and gradations of quality can be altered so that you can adjust it to your purpose.

Creating and Editing Your Rubric

Here are some quick steps to help you create your rubric. [hide/show](#)

Category:	4	3	2	1
<p>Identifies facts</p> <p>If you don't like the text in the box above, you can use the text box below to rename a category or type in a new category name.</p> <p>You may add or modify content in the rubric text boxes to the right.</p>	<p>Student accurately locates at least 5 facts in the article and gives a clear explanation of why these are facts, rather than opinions.</p> <p>Reset</p>	<p>Student accurately locates 4 facts in the article and gives a reasonable explanation of why they are facts, rather than opinions.</p> <p>Reset</p>	<p>Student accurately locates 4 facts in the article. Explanation is weak.</p> <p>Reset</p>	<p>Student has difficulty locating facts in an article.</p> <p>Reset</p>
<p>Identifies opinions</p> <p>If you don't like the text in the box above, you can use the text box below to rename a category or type in a new category name.</p> <p>You may add or modify content in the rubric text boxes to the right.</p>	<p>Student accurately locates at least 5 opinions in the article and gives a clear explanation of why these are opinions, rather than facts.</p> <p>Reset</p>	<p>Student accurately locates at least 4 opinions in the article and gives a reasonable explanation of why these are opinions, rather than facts.</p> <p>Reset</p>	<p>Student accurately locates at least 4 opinions in the article. Explanation is weak.</p> <p>Reset</p>	<p>Student has difficulty locating opinions in an article.</p> <p>Reset</p>
<p>- Please Choose -</p> <p>If you don't like the text in the box above, you can use the text box below to rename a category or type in a new category name.</p>	undefined	undefined	undefined	undefined

Once you have generated your rubric you can either:

- **Print or download it without saving**
You can print your rubric or save as pdf. You can also download it in Excel format what allows you to edit the Rubric in Excel.
- **Save it online on Rubistar's database**
You can choose whether you want to save your rubric temporarily by specifying an expiry date or permanently.

Rubistar also allows you to create new rubrics from scratch. You can define how many rows and columns you want to have and specify your categories and gradations of quality from scratch.

When downloading your rubric to Excel, you can duplicate the rubric for each student and use for the grading. Of course, you can also provide students with print-outs or online documents, so that they can use the rubric for self- or peer-grading.

To collate grading data for all your students, you can either use Excel or Rubistar. Rubistar provides an analysis tool; you can enter the number of students in each category/gradation of quality field and Rubistar shows the percentage. This will provide you with an overview of achievements across your class.

Caveats

- Learning assessment tools such as checklists or rubrics could possibly distract from the holistic aspiration of a task (e.g. essay writing). Students may try to tick the items listed in the tool rather than to tackle the holistic task.
- Research suggests that students paid less attention to the comments when given marks and consequently did not try to use the comments to make improvements (Nicol & MacFarlane-Dick 2006)

Task force work on learning assessment

Learning assessment ideas related to the online course units

We are collecting learning assessment ideas when reviewing the online course units – questions that students can be asked as well as activities for formative learning assessment. Please ask Veronika for the most recent version of the questions and activities tables. Any comments are very welcome.

Notes from the July 2019 workshop

The task force agreed that some information on learning assessment will be integrated into the lecturer toolkit.

The following aspects of learning assessment were seen as important:

- Focus on formative assessment; to be done continuously, regularly
- Building on the students' mental process not on physical ability
- Should be supportive and free of bias
- To be based on student's individual capability; use diverse learning assessment methods since students have different talents and preferences
- Acknowledge students' different ways of expressing their learning; build students' soft skills to express their understanding
- Consider that students have different levels of confidence
- Consider feasibility; what is realistic considering the number of students?
- What is useful? What is the target?
- Employ time and class management

*Everybody is a genius. But if you judge a fish
by its ability to climb a tree, it will live its whole
life believing that it is stupid.
(Credited to Albert Einstein)*

Literature

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