

Approaches to evaluate critical thinking dispositions

NG, Connie S. L.

National Institute of Education, Nanyang Technological University, Singapore

Abstract: Critical thinking has always been a central goal of education, but having critical thinking skills does not necessary meant that the person will use these skills even when the situation requires the application of such skills. Good critical thinkers need to have both thinking skills and the dispositions to use these skills. Education institutions should, in addition to teaching critical thinking skills, cultivate learners' critical thinking dispositions. Educators need to measure critical thinking dispositions so that they have a means to determine whether a learner's poor performance on a thinking skill test is due to a lack of ability or a lack of disposition. This will help educators to decide on the appropriate intervention to implement. Some approaches that have been used to measure critical thinking skills include surveys, scoring rubrics and essay tests. In this paper, different approaches to measure critical thinking dispositions are reviewed and the pros and cons of each approach will be discussed. The discussion would be helpful to educators who would like to measure the critical thinking dispositions of their students.

Keywords: critical, thinking, dispositions, evaluate, assess

Introduction

Traditionally critical thinking is defined in terms of cognitive ability and skills (Tishman & Andrade, 1996). In recent years, there is recognition that having the skills to do something does not necessary mean that people will use it even when the situation calls for it (Ennis & Norris, 1990). Besides having the thinking skills, good thinkers need to have the inclination to use the thinking skills when the occasion calls for it (Tishman & Andrade, 1996).

Some researchers, such as the participants of the Delphi Project (Facione, 1990) and Ennis (1987) extend the definition of critical thinking to include both abilities and dispositions. Researchers define critical thinking dispositions differently and come up with their own lists of critical thinking dispositions. Ennis (1989) defines critical thinking dispositions as the tendencies to do something given certain conditions. Tishman and Andrade (1996) define critical thinking dispositions as tendencies toward particular patterns of intellectual behavior. Facione, Facione and Giancarlo (1998) explain critical thinking dispositions as a person's internal motivation to think critically when faced with problems to solve, ideas to evaluate, or decisions to make.

The participants of the Delphi Project (Facione, 1990) identified 7 components of critical thinking dispositions: inquisitive, open-minded, systematic, analytical, truth seeking, critical

thinking self-confident and maturity of judgement. Hence an ideal critical thinker, according to the Delphi Report, is described as “habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit.” (Facione, 1990). Ennis (1987) came up with 14 critical thinking dispositions which include the tendency to be open-minded, to look for alternatives and seek as much precision as the subject permits.

There are other researchers who label the affective domain of critical thinking using other names. For example, Costa and Kallick (2000) term the affective domain of critical thinking as habits of mind, which refers to having the dispositions to behave intelligently when confronted with problems with no immediate answers.

Despite the different definitions and lists of critical thinking dispositions, it is important for students not only to pick up critical thinking skills (Facione, Facione & Giancarlo, 1997) but also to develop the dispositions to use these skills (Facione, Sánchez, Facione & Gainen, 1995). Only with the development of critical thinking dispositions, can students succeed in school and throughout their lives (Halpern, 1998).

With the inclusion of the affective domain in the definition of critical thinking, there is a need for instruments to measure critical thinking dispositions. When a learner does poorly on a thinking test, the educator needs a way to know if the poor performance is due to a lack of abilities or dispositions. (Ennis & Norris, 1990). Only then, can educators decide on how to select and design the appropriate intervention to implement to help the learners (Giancarlo, Blohm & Urdan, 2004).

This paper looks at the various approaches used by different researchers and educators to assess the affective domain of critical thinking-habits of mind/ critical thinking dispositions and the pros and cons of these approaches.

Evaluating Critical Thinking Dispositions

Given the various ways of labeling and defining the affective domain of critical thinking, it is no surprise that different approaches and methods have been used to evaluate or assess critical thinking dispositions. A survey of literature on the assessment of critical thinking dispositions (Norris, 1992) and habits of mind (Marzano, Pickering & McTighe, 1993) indicates that critical thinking dispositions has been assessed using approaches such as direct observation, rating scores, essays. Some of these methods are used in combination, for

example direct observation is usually used with rating scores. A brief description and review of these approaches is given in the following sections.

Direct Observation

In this approach, learners are observed on how they behave as they work on given tasks which provide them with the opportunity to display the critical thinking dispositions. The learners could be observed on how they respond to the given task or make use of given standardized prompts and hints to complete the tasks given. Assessors will record their observations against scoring rubrics, which consists of a list of indicators. For example, for the dispositions-“considering different points of views”, assessors could observe how the learners seeks alternative viewpoints from others, how willing they are to explore differing viewpoints and what kinds of questions they ask.

Depending on the dispositions measured, different types of tasks could be given to the learners. If learners are to be assessed on whether they are able to persevere in the face of difficulty, they could be given tasks that are typically challenging for them. Norris (1992) presented learners with a focused, yet open-ended problem, such as a search for living creatures on another planet. The problem included sufficient information to provide learners with the opportunity to derive hypotheses, interpretations, and conclusions.. Norris (1992) then analyzed learners’ responses to determine their critical thinking dispositions. Ennis (1994) argued the assessing critical thinking dispositions through such guided open-ended opportunities is a promising way as learners have the opportunity to pursue any pattern of thinking that they want in response to the given problem.

Direct observation as an approach to assess critical thinking dispositions can be considerably successfully if raters are able to observe the learners as they are engaged in the process of doing their tasks, especially if they are able to articulate what they are thinking as they go along (Facione et al., 1997).

On the other hand, direct observation could be complicated, time consuming and very context specific. As dispositions are manifested differently in different settings, reliability of using direct observation to assess critical thinking dispositions could be deemed questionable. Another disadvantage is that as the conditions for direct observation are usually formal, the learners’ responses in informal situations are not observed. In addition, as scoring rubrics are frequently in direct observation, inter-rater reliability on the use of the rubrics needs to be established

Rating Scales

Another way to assess dispositions is those based on information derived through the use of rating scales. The assessor who needs to be someone who knows the learners for a certain period of time, such as teachers, parents, peers. This method was used in the Competent Children's Project, a New Zealand longitudinal study on the learning dispositions of children from age 5. The authors assessed the children's 'being competencies' (communication, inquisitiveness, perseverance, peer social skills, social skills with adults and independence) over time by asking the children's teacher to describe the child on a five-point likert scale. (Carr & Claxton, 2002). For each competency, for example 'perseverance', there are four descriptors: keep trying till resolves problem with puzzle/toy, persists in problem-solving when creating, good concentration span on things of interest and makes an effort, even if unconfident. The teacher was asked to judge, over a certain period, the extent that a given description matched the child (Carr & Claxton, 2002).

One advantage of such rating scale is that it provides comparable data across settings and they aggregate the scores for a cohort. Such rating scales are also quick and easy for teachers to fill in. However, as teachers do not record any specific incidence, but rather based their ratings on their general perception of students, ratings could be impressionistic. In addition, they do not encourage detailed observations of learners nor do they help the assessors to understand the kinds of activities which will lead to the development of the dispositions.

Learner Self Assessment

The third category of assessment method for evaluating critical thinking dispositions are those based on self-report or self-assessment by learners themselves. Examples of self assessment instruments are (i) surveys/questionnaires and (ii) reflective learning logs.

(i) Surveys/Questionnaires

Self assessment instruments such as surveys or questionnaires usually consist of a statement followed by a response continuum such as strongly agree, agree, disagree and strongly disagreed. The subject selects the response that best describes his reaction to the statement.

One such questionnaire for assessing critical thinking dispositions is The California Critical Thinking Disposition Inventory (CCTDI), which consists of 75 "agree-disagree" items to measure thinking dispositions. For example, one of the items from the inventory is: "We can never really learn the truth about most things". After learners have responded to all the questions, the CCTDI provides a profile of seven critical thinking dispositions: truthseeking, openmindedness, analyticity,

systematicity, critical thinking self-confidence, inquisitiveness, and maturity (Tishman & Andrade, 1996).

The advantage of questionnaires is that such instruments are easy to administer and score. However, the respondents of questionnaires could fake dispositions that they do not have, as they might choose socially desirable responses (Ennis and Norris, 1990). In addition, questionnaires need considerable time and effort to design and to establish the reliability and validity. One solution is to use available questionnaires which are already available. In the area of critical thinking dispositions, the CCTDI stands out as the main questionnaire that has been tested for reliability and validity. The internal consistency of the instrument, based on a typical sample, achieved a Cronbach's Alpha of 0.90 and the overall Cronbach's Alpha on the seven CCTDI sub-scales ranges from 0.72 to 0.80

(<http://www.insightassessment.com/test-cctdi.html>)

(ii) Reflective Learning Logs

Reflective learning logs are journals within which students are encouraged to reflect regularly their learning. To guide the learners' reflection, questions could be given to students. For example, learners could be asked to describe how well they have applied certain critical thinking dispositions to complete a given task. The assessor needs to periodically collect the reflection logs to review students' responses. The teacher might also meet students individually to discuss the responses.

Use of such journals acts as cumulative records of students' learning progress and allows the assessor to gain insights to situations outside of the classroom activities, which might help to shed some light on the dispositions of the learners (Carr & Claxton, 2002). The learning logs also encourage reflection by the learners and hence can be part of the educational practice that encourages dispositions (Carr & Claxton, 2002). However, such instruments tend to be time consuming, specific to the learning activities/tasks and could be unsystematic.

Essay Tests

Marzano et al. (1993) suggests that students be given a variety of tasks and situations in which they have the opportunities to demonstrate their understanding and to thoughtfully apply knowledge and skills and habits of mind in a variety of contexts. He suggests that the teacher first construct a task that allows the students to apply complex thinking skills. These assessments should result in an observable performance or tangible product, such as essays, projects or video-taped presentations. These products are then analyzed for evidences of

critical thinking dispositions. Two examples of how essays could be used to evaluate critical thinking dispositions are briefly described in the next two paragraphs. The first one is the Ennis-Weir critical thinking essay test and the second one is a study done by Neo and Cheung (2005), who came up with their own essay test and scoring rubrics.

The Ennis-Weir critical thinking Essay test, which was designed to assess critical thinking skills, is able to test for certain critical thinking dispositions such as considering alternative possibilities or explanations. In the Ennis-Weir critical thinking essay test, learners are presented with a letter written by a member of the public to the editor of a fictional newspaper. In the letter, the writer makes an argument for a parking problem. Learners are asked to read the letter, analyzed and evaluated the thinking shown and write a letter to the editor in response to each of the paragraphs. Scorers are given scoring sheet consisting of nine descriptors (eg recognizing that there are many ways of preventing accidents and that some of the writer's points are valid) (Ennis & Weir, 1985).

Neo and Cheung (2005) assessed learners' critical thinking dispositions by evaluating argumentative essays done by the subjects in their study. For their study, the authors came up with their own scoring rubrics, based on Facione's list of critical thinking dispositions. The subjects were asked to give their views on a controversial issue, but they were not informed that scorers would look out for evidence of critical thinking dispositions. This is to prevent the subjects from attempting to exhibit the desired dispositions in the essay. Two different scorers then went through the essays for evidence of critical thinking dispositions. A Wilcoxon Matched-Ranks test was used to analyze the data. Inter-coder reliability for coding the critical thinking dispositions is reflected using the Kappa value. This is measured by comparing the scorings done by the two scorers for coding the critical thinking dispositions that are displayed in the essays. The Kappa values for coding the indicators of different dispositions ranged from fair to excellent (Neo & Cheung, 2005).

Using essay tests as an approach to evaluate critical thinking has its own limitations and advantages. As Neo and Cheung (2005) pointed out - the use of essay test to assess critical thinking dispositions is limited by the one-way feedback. Hence, in their study, they only focused on the dispositions of open-mindedness, analyticity, systematicity and truth seeking. For the Ennis-Weir critical thinking Essay test, it does not discriminate between the influence of disposition and ability on performance. Hence though it can be used to give some indications of the critical thinking dispositions of the learners, it is nevertheless limited because it was never meant to focus only on critical thinking dispositions.

Conclusion

The affective domain of critical thinking dispositions is labeled and defined differently by researchers. Various approaches and methods, each with its strengths and limitations, have been devised to assess critical thinking dispositions. One of the considerations on the choice of approach to use should be how critical thinking disposition is defined in the study. The assessment of critical thinking dispositions, as for any other dispositions, needs to include various instruments and approaches to provide a more holistic assessment that will tap on the strengths of different assessment approaches.

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