# An exploration of the nature and assessment of student reflection

**Stuart Shaw** Cambridge Assessment International Education, **Martina Kuvalja** OCR, and **Irenka Suto** Research Division
(The study was completed when the second author was based at Cambridge Assessment International Education)

## Introduction

Reflection is often considered to be one of the so-called '21st century' or 'transversal' skills, or 'life competencies'. Many societies value people who can reflect upon their own beliefs and experiences in the classroom and beyond, and learn from them. It is also important to be able to contemplate the work of others at a deep level. In this article, we review some of the academic literature on reflection and explore ways in which it is assessed in educational contexts. Cambridge Assessment International Education offers the General Certificate of Education Advanced Subsidiary level (GCE AS level) Global Perspectives and Research: This serves as a case study for how reflection can be assessed as part of a taught curriculum.

## An early definition of reflection

The American philosopher and educational reformer John Dewey (1859–1952) was one of the first to articulate the idea of reflective thinking. He is often regarded as the father of experiential learning, famously observing, "We do not learn from experience. We learn from reflecting on experience." Dewey defined reflection as "Active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends" (p.118).

Dewey's work has been studied widely by philosophers and has proven particularly popular with educationalists in his home country. Rodgers (2002), for example, deconstructs Dewey's concept of reflection as:

- a "meaning-making process that moves a learner from one experience into the next, with deeper understanding of its relationships with, and connections to, other experiences and ideas …" (p.845);

- a "systematic, rigorous and disciplined way of thinking" (p.845);

- a social phenomenon which happens in the community, through interaction with others;

- requiring "attitudes that value the personal and intellectual growth of oneself and others" (p.845).

The breadth of Dewey's definition of reflection (and its characteristics) has facilitated its adoption in multiple disciplines, where it has been used to construct different models of development.

## Self-reflection versus reflection upon other material

In education, it is useful to distinguish self-reflection from reflection upon other material. Students can reflect upon their own learning, which includes their personal experiences, perspectives, beliefs and claims. Alternatively, but often additionally, they can reflect upon the experiences, perspectives, beliefs and claims of others, and on study material presented as factual knowledge. Hereafter, we refer to this second type of reflection as 'reflection upon other material'.

## Reflection and critical thinking

Reflection upon other materials is sometimes, but not always, regarded as an element of critical thinking. For example, McPeck (1981) defines critical thinking as: "The propensity and skill to engage in an activity with reflective skepticism" (p.8). Ennis (1985) describes critical thinking as "reflective and reasonable thinking that is focused on deciding what to believe or do" (p.45). The relationship between reflection and critical thinking is arguably somewhat circular, however, as it is also possible to use other critical thinking skills such as analysis and evaluation during both self-reflection and reflection upon other material.

This is evident within Mezirow's concept of 'critical reflection'.[1] In his influential theory of 'transformative learning' (Mezirow, 1997), we are encouraged to view learning as a process of (i) becoming aware of our own assumptions and (ii) revising them. Among transformative learning theorists, critical reflection is "The means by which we work through beliefs and assumptions, assessing their validity in the light of new experiences or knowledge, considering their sources, and examining underlying premises" (Cranton, 2002, p.65).

Mezirow (1997) claimed that our frames of reference can be transformed through both 'subjective reframing' (which entails critical self-reflection) and 'objective reframing' (which entails critical reflection upon other material). For example, both types of reframing could occur when a student explores an historical period from the perspective of another nation, or when a student is introduced to a new method of solving a mathematical problem. There may be a single learning event that serves as a catalyst for transformation. Alternatively, the process may be much more gradual, occurring through a series of events both within and beyond the taught curriculum.

---

1. The origins of this concept can be traced back to *Critical Theory* which was developed by Adorno (1998/1969) amongst others (Marcuse, 1969; Horkheimer, 1972). This school of thought emphasises the reflective assessment and critique of society and culture by applying knowledge from the Social Sciences and the Humanities.

## Self-reflection, self-regulation and metacognition

There are at least two further traditions within educational and developmental psychology which include self-reflection in their conceptualisations of learning. The first of these is the Vygotskyian tradition: This takes a 'socio-cultural' approach to exploring the self-regulation of learning and the internalisation of regulatory processes (Vygotsky, 1986). In the context of a goal-directed activity, self-regulation is considered to comprise: planning, monitoring (keeping track of the activity), updating progress, control (retaining or changing an action as needed), and contemplation of the outcomes (Pintrich, 2004; Pintrich & Zusho, 2002; Schunk & Zimmerman, 1994; Schunk, 2005). Self-reflection represents the final stage of this self-regulatory cycle, when a student reviews and evaluates his or her own performance in relation to the original goal. Vygotsky believed that psychological development emerges through interpersonal connections and interactions with the social environment, with language playing a crucial role in this process. Self-regulation, including self-reflection, would therefore be evident in joint learning activities.

The link between various manifestations of cognitive self-regulation and academic achievement is well documented for secondary school students (Zimmerman, 2002). However, neo-Vygotskians also emphasise that in addition to regulating their own cognitive processes, students need to regulate their own emotional responses, motivational states, and the contexts in which their learning occurs. Behaviours which evidence emotional and social self-regulation include delaying gratification (inhibitory control), persevering with tasks, and displaying appropriate manners.

In the second tradition, cognitive psychologists are attempting to expand a fine-grained understanding of a set of executive functions which enable the successful metacognitive regulation of one's own performance. Metacognition is the process of thinking about one's own cognitive, emotional, motivational and social functioning (Efklides, 2008). It plays a crucial part in critical thinking (Magno, 2010). For example, if a student is asked to analyse, evaluate, and synthesise material on a topic of interest, he or she needs to be able to do so with as little bias as possible. This is possible through a constant monitoring process (metacognitive monitoring – Flavell, 1981a; 1981b) which involves self-reflection. If bias is detected, then the student can engage in self-control (self-regulation) and re-evaluate his or her own conclusions on the studied topic. Critical thinking can therefore involve both self-reflection and reflection upon other material concurrently. Cambridge Assessment's own definition of critical thinking includes self-reflection in this sense (Cambridge Assessment, 2007).

Findings are consistent on the positive influence of both naturally emerging and taught metacognitive and self-regulatory behaviours from an early age through to undergraduate level study; such behaviours lead to better academic performance (Chemers, Hu, & Garcia, 2001; Forman & Cazden, 1985; Palinscar & Brown, 1984; Siegler, 2002). An effective way of encouraging self-regulation and metacognitive thinking in students is through providing them with opportunities to practise these aspects of learning, and to reflect further upon that practice (Nicol & Macfarlane-Dick, 2006).

## Assessing reflection

When we speak of reflection, we are referring to opaque higher-order thinking processes that are, by their very nature, difficult to assess. As with assessments in traditional academic subjects, we can design tasks to elicit behaviours that require students to use these internal thought processes. We must also then define clearly the indicators of such processes.

When assessing reflection, it could be argued that there is a risk of assessing merely the ability to remember and report (that is, memory and writing or oral skills) rather than all of the mental processes that constitute reflection. This could lead to confusion for students in knowing the criteria on which they are being assessed (Wilson, 2013). It is also difficult to establish whether reflections (irrespective of how they are captured) resemble students' authentic experiences (Ryan & Ryan, 2013). There is an argument that reflection should not be assessed in an educational setting at all, although it should be established and nurtured in the classroom. For example, Ixer (2016) claims that by attempting to assess reflection we are distorting the construct.

However, there are several good reasons why assessing reflection remains desirable. Firstly, students often focus on assessment in their learning, and their learning becomes motivated by assessment (Watkins, Dahlin, & Ekholm, 2005). The assessment of reflection may therefore increase the value of reflection in the eyes of students. Secondly, a related function of assessment can be to make student learning visible. A third important function of assessment is diagnosis. In this regard, assessment can be part of a process used to determine students' strengths and weaknesses. It may therefore be needed to identify students who struggle with reflection.

Arguably, many examinations in traditional subjects include the covert assessment of reflection upon other material because they assess critical thinking skills. For example, History and English Literature examinations frequently require students to reflect upon sources and literary excerpts and evaluate them in multiple respects. In these subjects and others, examination questions that begin with the classic opener 'Compare and contrast…' usually require students to reflect in this sense. Similarly, Science examinations may require students to reflect upon the outcomes of experiments when interpreting their findings. Perhaps more explicitly, the OCR awarding body offers General Certificate of Education Advanced Subsidiary and Advanced level (GCE AS and A level) Critical Thinking, which are skills-based, rather than content-based.[2] Cambridge Assessment International Education assesses critical thinking explicitly within its AS and A level Thinking Skills.

When it comes to self-reflection, the most widely used method of assessment is reflective writing (e.g., Barney & Mackinlay, 2010; Carrington & Selva, 2010; Fitzgerald, 2009; Ghaye, 2007; McGuire, Lay, & Peters, 2009; Moon, 2013). This can take a variety of forms. For example, learning portfolios have been found to encourage reflective thinking per se (Scott, 2009) and can be used in assessment. They enable students to document, store and review their work. The portfolios can then be used by teachers to analyse students' strengths and weaknesses in depth, particularly for formative purposes (Fernsten & Fernsten,

---

2. Over the past few years AS and A levels were redeveloped nationally. Unfortunately it was not possible to develop Critical Thinking content that met the national regulator's principles for reformed AS and A levels. The final assessment session opportunity for first time candidates is therefore Summer 2018, with resits available in 2019.

2005). Within learning portfolios, reflective journals and log books are often used to record self-reflection in regard to the overall learning experience (Ghaye, 2007). Recording reflective thinking in such a manner has been found to have a positive impact on students' overall metacognitive and other critical thinking skills (Naber & Wyatt, 2014), which might in turn have a positive 'knock-on' effect on students' learning performances (McCrindle & Christensen, 1995; Mauroux, et al., 2015; Nückles, Hübner, & Renkl, 2009).

When writing in their reflective journals, students are usually encouraged to record their reflections as they occur, or as soon as possible afterwards. In this way students avoid relying on their memory and retrieving this information after the internal authentic reflective process has already happened. This approach should also reduce a student's temptation to 'fill in' their memory gaps with false information and inauthentic experiences. This may reduce a key threat to validity for this kind of assessment.

Reflective papers provide a means of assessing both reflection upon other materials and self-reflection. Students are often given a topic and stimulus materials upon which they have to critically reflect (framing their reflection 'objectively'). They are also expected to demonstrate reflections upon their own initial and (potentially) changed perspectives, which occur as a result of researching a topic ('subjective framing'). Reflective papers and essays can be highly structured or unstructured, giving students the opportunity to engage in reflection in a unique way.

## Operationalising the construct of reflection for assessment purposes: a case study

In this section we explore an example of the 'reflective paper' approach to assessment. The AS level Global Perspectives and Research is a skills-based programme of study offered by Cambridge Assessment International Education. It assesses reflection as part of a taught curriculum, and its aim is to encourage students to think about and explore issues of global significance. Global Perspectives and Research students are expected to engage in metacognitive and critical thinking with regard to their own perspectives and understanding of a topic, as well as those of others. Schunk and Zimmerman (1994) and Whitebread, et al. (2009) have argued that such skills are crucial for the development of independent and self-regulated individuals who are capable of collaborating and co-operating with others.

AS level students are assessed via three compulsory components:

1. A written examination
2. An essay
3. A team project.

For the team project, students work in teams to identify a local problem which has global relevance. Individual team members research the issues and suggest solutions to the problem based on their research findings. Working together, a set of proposed team solutions to the problem is agreed. While the focus is on teamwork, each student within a team prepares two pieces of work for individual submission: an 8-minute presentation of their individual research and proposed solutions to the problem (which is delivered to an audience), and an 800-word reflective paper.

The reflective paper gives students the opportunity to consider the process they have undertaken in researching and producing their individual presentation as part of a team. As such, it is their chance to provide evidence for reflection, which is Assessment Objective 2 (AO2), and the collaboration aspect of Assessment Objective 3 (AO3). For AO2 (reflection), students are assessed on their ability to:

- research and consider alternative perspectives objectively and with empathy;
- consider the ways in which personal standpoints may have been affected by the research process;
- evaluate the impact of alternative perspectives and conclusions on personal standpoint; and
- identify the need for further research in light of the research findings.

The reflective paper is assessed externally. It accounts for 10 marks of the total of 100 for the whole AS level: There are 5 marks for AO2 and 5 marks for AO3. There are two assessment criteria: the first relates to considerations of one's own perspective, belief and knowledge (Mezirow's [1997] 'subjective framing'), and the second relates to considerations of other's perspectives, beliefs and knowledge ('objective framing'). Each criterion is assigned a level from 1 to 5 when marking (see Table 1).

**Table 1: The Cambridge Assessment International Education Global Perspectives and Research Reflective Paper mark scheme**

| Level | Marks | Indicative descriptors |
|---|---|---|
| 5 | 9–10 | • The candidate engages in a **probing and critical** evaluation of their own practice in working with others to identify a local problem and explore possible solutions.<br>• The candidate reflects **fully** on how their personal standpoint and scope for future research have been affected by alternative team and research perspectives. |
| 4 | 7–8 | • The candidate engages in **some effective** evaluation of their own practice in working with others to identify a local problem and explore possible solutions.<br>• The candidate undertakes **some clear** reflection on how their personal standpoint and scope for future research have been affected by alternative team and research perspectives. |
| 3 | 5–6 | • The candidate evaluates to **some extent** their own practice in working with others to identify a local problem and explore possible solutions.<br>• The candidate undertakes **some** reflection on how their personal standpoint and scope for further research have been affected by alternative team and research perspectives. |
| 2 | 3–4 | • The candidate **attempts** to evaluate their own practice in identifying a local problem and exploring possible solutions, but **may lack** consideration of their work with others.<br>• The candidate **attempts** to reflect on how their personal viewpoint and scope for further research, but **may lack** a consideration of alternative team or research perspectives. |
| 1 | 1–2 | • The candidate shows **limited** evaluation of their own practice and **lacks** consideration of their work with others.<br>• The candidate shows **limited** reflection on their personal viewpoint and scope for further research and **lacks** any consideration of alternative team or research perspectives. |
| 0 | 0 | No creditworthy material has been submitted. |

The reflective paper needs to be understood as a separate and intellectually demanding piece of work, where students undertake two distinct tasks. Firstly, they need to evaluate the effectiveness of the

way in which the group worked together in undertaking their research. Secondly, they also need to consider how their own views were challenged or developed by engaging with the alternative perspectives suggested by other team members (or other perspectives and solutions they located in the research that they undertook). More able students are expected, therefore, to evaluate and make judgements on their performances, going beyond just descriptions of what they did. This makes the activity a rewarding yet challenging task to accomplish successfully. The two assessment criteria can be conceptualised as questions against which the reflective paper is judged, and it is expected that stronger performances ensure that both questions are addressed, using discrete sections. For example:

*1. How well has the student evaluated their own practice in working with others to identify a problem and explore possible solutions?*

The focus here is on the student's evaluation of their own practice in working with others. This should go beyond what the group did and focus on areas that worked well and/or were less successful before making a reasoned judgement on the success of the group work. Thus, the reflective paper affords an opportunity for self-reflection leading to personal transformation (Mezirow, 1997). The following is an example from a student's reflective paper of a simple but effective approach to outlining an aspect of teamwork. The student then highlights strengths and weaknesses, and the actions taken as a result:

> *Within our group we partnered into pairs and assigned each pair with two of the four components we wanted to cover. Then the two members within those pairs would assign one of the components to each other. By doing this every group member had one of the aspects that they were responsible for researching and after all the information was gathered. We shared that information amongst one another. This was a very effective strategy because everyone in our group executed their assigned job with sufficiency and managed to provide everyone with useful information and resources needed to successfully complete our assignment in a timely manner. However, there was one minor issue that came across our group when using this method. Being able to copy and paste information was simple but being able to paraphrase and combat text chunkiness called for a bit more effort. Several of us struggled trying to avoid gathering twelve pages of information. We came to the conclusion that we needed to do better with only gathering the most important and helpful information.*

*2. How well has the student reflected on the extent to which their own standpoint and the scope for future research have been affected by alternative perspectives from within their team and from additional research?*

The focus for this second part of the assessment is on the impact of alternative perspectives. Students need to identify what those alternative perspectives are, and to assess the extent to which they have made an impact on their own point of view. The following is an example of the clear identification of how other team members have affected the student's position:

> *My point of view was strengthened because through research I discovered that strict immigration laws would be the most simple and most easy to follow. But, with further analysis into other perspectives such as unilateral immigration, presented by [Student B], made me realize that the strictness of laws may not be the best way to handle the solution. In that way was how I determined that [Student C]'s solution would be the most appropriate.*

The purpose of the reflective paper is to evaluate, not just describe, the student's experiences. Simply listing alternative perspectives, or the different aspects of the research, or the solutions reached, is not sufficient to be awarded a high mark. What is required is a reflection on how these things impacted on the student's own work. The following extract makes a clear transition between the two, demonstrating how the formulation of the team solution also developed their own understanding in specific ways:

> *After creating our group solution I felt that I had learned a lot about the economic, political and ethical themes within the subject of homelessness. Previously I only thought that people became homeless due to problems with drug addictions and a lack of money. However, now I am aware of the legal demands and other governmental requirements people have to go through before receiving a house.*

This is a clear illustration of how the student has critically reflected on the study material and on others' point of view with consequent self-regulation.

Able students appreciate the difference between evaluation and narration when it comes to writing about their practice in working with others. An account of what happened is not the same as an identification of working practices and a judgement on their strengths and weaknesses. In the following extract, the student begins by identifying the benefits of the high level of agreement among team members:

> *This level of cooperation was a welcome experience, however, I feel that the lack of any dissenting opinions and an effective devil's advocate possibly weakened the collective brainpower used in selecting our issue. When a group is so readily agreeable then there is the possibility of a stagnation of perspectives, which also limits possible conversation about solutions and paths to take.*

Here, strengths are weighed up against weaknesses in order to reflect on the wider implications for the effectiveness of collaboration and to make a judgement on it.

Strong reflective papers are clear about the specific strengths and weaknesses of the contribution made by other team members and the student's own experience of working with them:

> *I found working with [Student A] was good but also had its challenges. We were able to come together well and decide on a good topic and question. We were also able to connect on an intellectual level both of us being well educated students. I struggled a little bit at the start to form some points and find good information for my argument but [Student A] was able to suggest some idea as well as a few sources that could assist me. The only challenges I had with [Student A] were our ability to clearly communicate with each other and the fact that he or I were away from class frequently. Sometimes I found that he was a bit unclear with his arguments and so I was unable to form strong counter arguments. I also found it difficult for us to understand each other's standpoints as we were away quite a few times and so could not explain our perspectives and reasoning.*

One element of self-regulation is the evaluation of the progress and the outcome of the individual or joint goal-directed activity. It is

important for students to specifically identify and assess the impact of other perspectives on their own learning and views (Forman & Cazden, 1985). These perspectives may come from research that they have undertaken or from the findings of other team members, as in this extract related to a team project on the internet:

> My individual standpoint about the effects of the internet has been affected by both my own and my teammates' perspectives. I knew the internet had several negative effects before I started researching the topic. However I did not know the details about the many negative effects on our social lives and the many negative effects of the internet on both our mental and physical health. Therefore, my own findings for the social perspective affected my view on the topic. I was definitely astonished by the findings of my teammate who covered the medical perspective. I did not know much about the medical problems the internet can cause, and felt that it was very interesting and important to know, as it affects a lot of people almost every day.

Successful students have knowledge about themselves as students, including their strengths and weaknesses (Flavell, 1981b). In this extract, we observe metacognitive processing: The student identifies what they knew or thought before, the new information they have acquired, and how their understanding has changed. Metacognitive insights of this kind inform understanding of self and the learning process, and change and improve personal behaviour accordingly.

The next extract provides a good example of the 'place' of reflection. After evaluating the strengths and weaknesses in the team's work together, the student reflects upon the relative strengths of different team members' solutions to problems in the prison system in New Zealand:

> We came to the decision that the best solutions were [Student B's] solutions. It was fairly obvious that these solutions were the best from the beginning as they were the solutions that appeared to produce the best results and dealt with the roots of the crimes as opposed to dealing with the prisoners after they had already committed the crime and been put in prison. By taking an approach that looked at the core issues resulting in a higher rate of crimes and then finding a solution, [Student B] was able to develop three key resolutions to stopping crimes in the first place.

In this example, the effectiveness of the student's ability to reflect is shown in their willingness to acknowledge and precisely articulate the greater strength of another team member's solution, making a desirable outcome more likely (Halpern, 2003). The student has reflected critically on the reasons why a solution is effective. Strong reflective papers go beyond simply saying what everyone's role was, to thinking more closely about how individuals exploited their strengths, added breadth and depth to the arguments, and considered others' views before coming to a group solution.

It is important to note that reflective papers can only score Level 3 or higher when they evaluate the process of collaboration. This means identifying strengths and weaknesses, then reaching a judgement. Reflective papers which simply provide a narrative of what the team did, however fluently this is expressed, will not be able to do this. This conclusion to a student's evaluation of their team's collaboration is a good example of how this can be done in a straightforward but effective way:

> Thus, our strengths were we made use of our time when needed, and creative thinking played a good part and our weaknesses were the inability to exchange ideas efficiently and lack of motivation during some periods of the completion of the project; these factors altered the rate at which things were completed. As a result, I think the next time, as a group, we should hold more after school and weekend meetings to completely discuss the ins and outs of the problem along with each solution.

In the final extract, a reflective paper has been reproduced in full. It is a good example of how the quality of a response can benefit if a student is focused and detailed in evaluating their experiences of teamwork. The student takes care to explain the factors which had a negative impact on the team working effectively. They also do well in evaluating the impact of this on their project as a whole. This means that the response meets the requirements for Level 4 on the first criterion (see Table 1).

However, there appears to be no reference at all to their personal standpoint on the topic itself, or how that standpoint was affected by the other team members or their research. Therefore, the student has not demonstrated that they have critically reflected upon the assumptions and alternative perspectives others have taken in proposing their theories about the phenomenon under investigation. As a consequence, the paper can only receive a mark of 0 for the second criterion. This inconsistent profile of performance leads to a Level 2 achievement overall. The quality of the student's evaluation of the teamwork is such that a mark at the top of Level 2 would be the best fit.

> In all honesty, I feel as if the communication between my partner and I were (sic) not the best. Of course we have talked through how we would structure our presentation, who would write and present about what and have supported each other throughout the whole project, when we needed it. This group project was not the hardest, yet again, it was not the easiest. In comparison with other groups in our Global Perspectives class, there was only two of us in the AS level class, which limited our options to choose a partner and limited our numbers in a group. In a way I do not feel that it is fair to say that we had a disadvantage just because our group was made up only two people. Although it was definitely a lot more work that what others had to do. Or at least I feel as if it was like that. The project itself did take some time to work on for both of us. The paragraphs I have written are from both our perspectives of the good things, the bad things and the things we could have improved in. There were a couple of things that we had agreed on that we did well and a couple of things we agreed on what we did good and what we did wrong and things we agreed on which could have been improved. It was not easy.

> I think that we gave each other some good ideas of what we could write and talk about. As well as that, I think that we've been in on track of what we've been needing to do. The support and the understanding of each other was just fine. As struggles of not having such a big group in comparison to other groups in the class, I honestly think that we worked quite well (individually). It is honestly not easy having only one other person in the group, giving us almost double the work for the both of us. Having such a big topic – Global Warming – and for only two people takes a lot of effort and a lot of time, but I believe that we worked through it with good hope for the outcome.

> Although, there were a couple of disadvantages to this project. I do not think that we've had enough communication. That we sat in the same

*room but did not explain to each other everything about what we actually wrote down in details. Even though we talked a bit about what we have written down but I do not feel as if it was enough. It was difficult to actually work together or talk about the project together outside school. We do not live in the same house or part of school so it was difficult to figure out hours to which we would be working together. As well as figuring out when we could work together, we've been getting quite a load of homework and quite a lot of activities, so it takes up a lot of our free time. I do not feel that Facebook or Skype would have helped a great deal but of course it would have made a some kind of difference. I think that making a schedule of when we're going to work together, and how many hours would have made our planning and our work more efficient and we may not have been in a hurry. Although, even if I hadn't started on my group work right away, I had finished my part of the presentation before my partner did, but that was because I had actually worked on it in the time we had, using up my hours wisely, unlike my partner.*

*There is always room for improvement! I can think of a couple of things that we have agreed on that we could have done better. Looking back at what i've written in the above paragraphs, I can say that lack of communication could be improved. Togetherness could be improved as well (using time out of school to work on the group of project). Though, with the struggle of only being two in the group, I think that learning to cope with double as much work is a good strategy that we will have to grow with. This would have given us an advantage of polishing our work with hopes for our reader's satisfaction. I admit that I; and my partner, did not start right away. It did take me, at least, a couple of weeks to start writing, though for the couple of weeks before actually starting the project, I was wondering what would be in it, what I would write, what I would say as well as the improvement and the ups and downs of this project.*

## Conclusions

Ensuring that students succeed in the 21st century requires fresh thinking about what knowledge and competencies are, and how they should be supported throughout education. In this article, we have looked briefly at key conceptualisations of reflection within the academic literature. Whilst there is a degree of circularity in the definitions of some key terms, it is clear that skills in both self-reflection and reflection upon other material are valued highly in several schools of thought which have not always aligned historically. Despite the difficulties of assessing reflection as authentic student experience, we have considered the reasons why it is nevertheless important to do so, and have offered a practical example of how it can be done. It is hoped that studies of this kind will bring greater clarity to test designers and developers when they are defining and operationalising the construct of reflection and to teachers and students who wish to focus on reflection within their curricula.

## Acknowledgements

## References

Adorno, T. W. (1998/1969). *Critical models: Interventions and catchwords*. NY: Columbia University Press.

Barney, K., & Mackinlay, E. (2010). Creating rainbows from words and transforming understandings: Enhancing student learning through reflective writing in an Aboriginal music course. *Teaching in Higher Education, 15*(2), 161–173.

Cambridge Assessment. (2007). *Critical Thinking: Deriving the Definition. Factsheet 1*. Retrieved from http://www.cambridgeassessment.org.uk/Images/109971-critical-thinking-factsheet-1.pdf

Carrington, S., & Selva, G. (2010). Critical social theory and transformative learning: Evidence in pre-service teachers' service-learning reflection logs. *Higher Education Research & Development, 29*(1), 45–57.

Chemers, M., Hu, L., & Garcia, B. (2001). Academic self-efficacy and first year college student performance and adjustment. *Journal of Educational Psychology, 93*(1), 55–64.

Cranton, P. (2002, Spring). Teaching for transformation. In J.M. Ross-Gordon (Ed.), *New directions for adult and continuing education: No. 93. Contemporary viewpoints on teaching adults effectively* (pp.63–71). San Francisco, CA: Jossey-Bass.

Dewey, J. (1933). *How we think: A restatement of the relation of reflective thinking to the educational process*. Lexington, Massachusetts: D.C. Heath and company.

Efklides, A. (2008). Metacognition: Defining its facets and levels of functioning in relation to self-regulation and co-regulation. *European Psychologist, 13*(4), 277–287.

Ennis, R. H. (1985). A logical basis for measuring critical thinking skills. *Educational Leadership, 43*(2), 44–48.

Fernsten, L. & Fernsten, J. (2005). Portfolio assessment and reflection: Enhancing learning through effective practice. *Reflective Practice, 6*(2), 303–309.

Fitzgerald, C. (2009). Language and community: Using service learning to reconfigure the multicultural classroom. *Language and Education, 23*(3), 217–231.

Flavell, J. H. (1981a). Monitoring social cognitive enterprises: something else that may develop in the area of social cognition. In J. Flavell, & L. Ross (Eds.), *Social Cognitive Development: Frontiers and Possible Futures* (pp.272–287). Cambridge: Cambridge University Press.

Flavell, J. H. (1981b). Cognitive monitoring. In W. P. Dickson (Ed.), *Children's oral communication* (pp.35–60). New York: Academic Press.

Forman, E. A., & Cazden, C. B. (1985). Exploring Vygotskian persepctives in education: The cognitive value of peer interaction. In J. W. Wertsch (Ed.), *Culture, Communication and Cognition: Vygotskian Perspectives* (pp.323–347). Cambridge, UK: Cambridge University Press.

Ghaye, T. (2007). Is reflective practice ethical? (The case of the reflective portfolio). *Reflective Practice, 8*(2), 151–162.

Halpern, D. F. (2003). *Thought and Knowledge: An Introduction to Critical Thinking*. London: Lawrence Erlbaum Associates.

Horkheimer, M. (1972). *Critical theory: Selected essays (Vol. 1)*. New York: Continuum.

Ixer, G. (2016). The concept of reflection: is it skill based or values? *Social Work Education, 35*(7),809–824.

Magno, C. (2010). The role of metacognitive skills in developing critical thinking. *Metacognition and Learning, 5*(2), 137–156.

Marcuse, H. (1969). *An essay on liberation* (Vol. 319). Beacon Press.

Mauroux, L., Zufferey, J. D., Rodondi, E., Cattaneo, A., Motta, E., & Gurtner, J. L. (2015). Writing reflective learning journals: Promoting the use of learning strategies and supporting the development of professional skills.

In M. Bétrancourt, G. Ortoleva, & S. Billett (Eds.), *Writing for professional development* (pp.107–128). Leiden, The Netherlands: Brill.

McCrindle, A. R., & Christensen, C. A. (1995). The impact on learning journals on metacognitive and cognitive processes and learning performances. *Learning and Instructions, 5*(2), 167–185.

McGuire, L., Lay, K., & Peters, J. (2009). Pedagogy of reflective writing in professional education. *Journal of the Scholarship of Teaching and Learning, 9*(1), 93–107. Retrieved from http://files.eric.ed.gov/fulltext/EJ854881.pdf

McPeck, J. E. (1981). *Critical Thinking and Education*. Toronto: Oxford University Press. pp.v1, 170.

Mezirow, J. (1997). Transformative learning: Theory to practice. *New Directions for Adult and Continuing Education, 74*, 5–12.

Moon, J. A. (2013). *Reflection in learning and professional development: Theory and practice*. Oxon: Routledge.

Naber, J., & Wyatt, T. H. (2014). The effect of reflective writing interventions on the critical thinking skills and dispositions of baccalaureate nursing students. *Nurse Education Today, 34*(1), 67–72.

Nicol, D. J., & Macfarlane-Dick, D. (2006). Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. *Studies in Higher Education, 31*(2), 199–218.

Nückles, M., Hübner, S., & Renkl, A. (2009). Enhancing self-regulated learning by writing learning protocols. *Learning and Instruction, 19*(3), 259–271.

Palinscar, A. S., & Brown, A. L. (1984). Reciprocal teaching of comprehension-fostering and comprehension-monitoring activities. *Cognition and Instruction, 1*(2), 117–175.

Pintrich, P. R. (2004). A Conceptual Framework for Assessing Motivation and Self-Regulated Learning in College Students. *Educational Psychology Review, 16*(4), 385–407.

Pintrich, P. R., & Zusho, A. (2002). The development of academic self-regulation: The role of cognitive and motivational factors. In A. Wigfield, & J. S. Eccles (Eds.), *Development of Achievement Motivation* (pp.249–284). San Diego, CA, US: Academic Press.

Rodgers, C. (2002). Defining reflection: Another look at John Dewey and reflective thinking. *Teachers College Record, 104*(4), 842–866.

Ryan, M., & Ryan, M. (2013). Theorising a model for teaching and assessing reflective learning in higher education. *Higher Education Research & Development, 32*(2), 244–257.

Schunk, D. H. (2005). Self-regulated learning: The educational legacy of Paul R. Pintrich. *Educational Psychologist, 40*(2), 85–94.

Schunk, D. H., & Zimmerman, B. J. (1994). *Self-regulation of learning and performance: Issues and educational applications*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Scott, S. G. (2009). Enhancing reflection skills through learning portfolios: An Empirical Test. *Journal of Management Education, 34*(3), 430–457.

Siegler, R. S. (2002). Microgenetic studies of self-explanation. In N. Granott, & J. Parziale (Eds.), *Microdevelopment: Transition Processes in Development and Learning* (pp.47–59).

Vygotsky, L. S. (1986). *Thought and language (Newly revised and edited by Alex Kozulin)*. Massachusetts: MIT.

Watkins, D., Dahlin, B., & Ekholm, M. (2005). Awareness of the backwash effect of assessment: A phenomenographic study of the views of Hong Kong and Swedish lecturers. *Instructional Sciences, 33*(4), 283–309.

Whitebread, D. G., Coltman, P., Pasternak, D. P., Sangster, C., Grau, V., Bingham, S., & Demetriou, D. (2009). The development of two observational tools for assessing metacognition and self-regulated learning in young children. *Metacognition and Learning, 4*(1), 63–85.

Wilson, G. (2013). Evidencing reflective practice in social work education: Theoretical uncertainties and practical challenges. *British Journal of Social Work, 43*(1), 154–172.

Zimmerman, B. J. (2002). Achieving academic excellence: A self-regulatory perspective. In M. Ferrari (Ed.), *The pursuit of excellence through education* (pp.85–110). Mahwah, NJ: Erlbaum.

# When can a case be made for using fixed pass marks?

**Tom Bramley**  Research Division

## Introduction

General Certificate of Secondary Education (GCSEs) and General Certificate of Education Advanced levels (A levels) have sophisticated procedures to ensure that the grade boundaries on examination components are set in places that achieve the goal of maintaining standards over time and between awarding organisations (AOs). Statistical methods currently have a prominent role. The 'comparable outcomes' method of The Office of Qualifications and Examinations Regulation (e.g., Ofqual, 2011; Benton, 2016) produces a target distribution of grades for each examination[1] and the AOs have to set boundaries on the components that result in an overall outcome that does not deviate beyond an allowed tolerance from these targets. Although there are good reasons for using these sophisticated procedures (including the prevention of 'grade inflation', and helping to ensure examinees are not disadvantaged when there is a major or minor system change), they do have drawbacks in terms of the resources required to administer them, both in staff time and in data availability. They are well-suited to the GCSE and A level case where there are only one or two examination sessions a year, large cohorts of examinees of roughly the same age are taking the exams, and large administrative data sets tracking the previous educational achievement of these examinees are available. However, some other high- and low- stakes assessment contexts do not have these advantages. In particular, many vocational and other non-academic assessments (such as the driving theory test) are either available on-demand or have multiple testing sessions, with widely fluctuating cohort sizes and groups of test-takers

---

1. The target distribution is for those examinees for whom there is a measure of prior attainment: Key Stage 2 score at GCSE, and mean GCSE score at A level.