WAYS OF ENCOURAGING AND EVALUATING REFLECTIVE THINKING IN PRIMARY AND SECONDARY SCHOOL STUDENTS: EXAMPLES FROM A UK BASED INTERNATIONAL AWARDING BODY

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Abstract

This paper aims to discuss ways of encouraging and evaluation reflective thinking in primary and secondary school students, as demonstrated by the Cambridge International Examinations' (Cambridge) Global Perspectives (GP) qualifications.

Cambridge is an international awarding body which aims to develop not only subject-specific knowledge, but also encourages students to acquire vital skills important for further study, professional development and life in general. For example, Cambridge has developed primary and secondary programmes which are specifically designed to prepare students to think critically and to develop reflective thinking.

In Cambridge GP programmes, the skills of critical thinking, collaboration and reflection are acquired through researching topics which are relevant on a global and local level. In this process teachers have the important role of nurturing and encouraging students to develop these skills, while providing guidance on the researched topic. Teachers act as facilitators, negotiators, motivators and managers, rather than communicators of information. This involves prompting students to think for themselves, setting up and organising projects, responding to students’ interests, and guiding them to frame questions in areas that interest them.

Students are encouraged to use reflective journals and e-portfolios through all the stages of both team work and individual activities, in order to capture and record authentic experiences. In terms of assessment, reflective thinking is externally assessed through reflective papers and research reports produced by individual students.

Advantages and challenges in using this assessment model will be presented and discussed.

Keywords: Reflection, reflective thinking, assessment, 21st century skills.

1 INTRODUCTION

1.1 Reflective Thinking

Despite a growing body of work within the professional development literature investigating reflective practice, one of the main difficulties in studying reflection is that the literature comes from a variety of sources. This creates problems in conceptualising the construct, especially in the case of reflection as part of the learning process [1]. For example, the following concepts are often used as synonyms for reflection: thinking, reasoning, reviewing, problem solving, critical reflection, reflective judgement, and experiential learning [2].

John Dewey, often referred to as the father of experiential learning was the first to put forward the idea of reflective thinking. According to Dewey [3] reflection is “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” [3, p. 118]. Although this definition of reflection is widely quoted, a thorough exploration of the process and purpose of reflection is absent [4]. In addition, Dewey’s work has been studied mostly by philosophers, and it is not clear whether educational practitioners actually refer to his work in constructing their own teaching practice, and to what extent educational experts use his insights in investigating reflection in students. Rodgers [4] distilled from Dewey’s writings four criteria which characterise his concept of reflection, claiming that reflection:

- is a meaning-making process that pushes learners from one experience into the next with deeper understanding of its relations with and connections to other experiences and ideas. In
this sense, reflection ensures the progress of the individual and society, and it is a means to moral ends;
• is a systematic, rigorous and disciplined way of thinking;
• is a social phenomenon which happens in community, through interaction with others;
• requires attitudes that value personal and intellectual growth of oneself and others.

The broadness of Dewey’s definition of reflective thinking and the criteria which characterise the phenomenon has allowed experts in different disciplines to adopt the idea of reflection and to go on and develop their own models of reflection.

Following a review of the research on critical thinking, self-regulation and reflection in learners, we have identified that the focus of the reflection literature is either pertaining to students’ reflection on their study material, or students’ reflection on their own experiences. For example, in order to evaluate theories about a phenomenon in a critical manner, the learner needs to reflect on the assumptions others have made in proposing their theories regarding the phenomenon. In addition, in order to critically evaluate one’s own learning experience, cognitive and emotional challenges, the learner needs to engage in self-reflection. In the first case, the student’s reflection involves contemplation of external stimuli (e.g. others’ assumptions and theories), while the latter involves internal mental processes in response to the student’s own personal psychology. Therefore, the object of reflection is different in these two scenarios. In the first, the object is others’ assumptions (for instance, the author of the study material), whereas in the second scenario, the object of reflection is the self.

This idea is well articulated in Mezirow’s work on critical reflection and transformative learning ([5], [6], [7], [8], [9]). Mezirow claimed that our knowledge, or “frames of reference” [9, p. 7], is transformed through critical reflection. He argued that one critically reflects on the assumptions one or others make when they are involved in problem solving. He makes a distinction between so called “objective reframing” [9, p. 7], which takes place when a learner critically reflects on the study material and other’s point of view, and “subjective reframing” which involves critical reflection on learner’s own ideas, beliefs and points of view. According to the same author, self-reflection can lead to significant personal transformations [9].

Ensuring that students at any age succeed in the twenty-first century requires fresh thinking about what knowledge and competencies are or should be supported throughout education. Except in rare instances, our current education system neither teaches nor assesses such competencies, despite a growing body of evidence suggesting that skills such as persistence, creativity, self-reflection, self-regulation, openness, and teamwork can substantially impact students’ academic achievement ([10], [11], [12]). Consequently, there is a need to design and develop valid assessments to measure and support these competencies.

An explanation for the lack of programmes which nurture and assess these soft skills may be the difficulty of defining and assessing them. When we speak of reflection, we are referring to internal mental processes which are, by their nature, difficult to assess. We can only design tasks which would attempt to elicit these behaviours and to clearly define indicators of these internal mental processes. In educational and cognitive psychology, there are many methods used for assessing metacognitive abilities in adults and children such as: questionnaires, interviews, self-report, think aloud methods, stimulated recall, on-line computer logfile registration, and behavioural measures (such as eye tracking).

However, many of these assessment tools have suffered from criticisms about their validity [13]. For example, in older children and adult populations, memory and social desirability effects interfere with the accuracy of many of the measures. In young children, these effects are even more pronounced [14]. On the other hand, observations seem to be the most reliable method of assessing these skills as they do not rely exclusively upon the verbal abilities of the children [15].

There is an argument that soft skills such as reflection, collaboration and communication should not be assessed at all though they should be established and nurtured in the classroom. Ixer ([16], [17], [18]) claims that reflection cannot be assessed due to its internal nature, and that by doing this we are actually distorting the construct. It could be argued that by assessing reflection, we are merely assessing the ability to remember and report (memory and verbal skills), rather than what is arguably more valuable from an educator’s perspective, which is specifically the mental process of reflection itself, including how the student responds to external and internal stimuli, how they evaluate their responses and finally, come to conclusions based on their reflection. Wilson [19] argues that many
students find themselves confused with what they are actually assessed on - critical reflection on the study material, or their personal self-reflection.

Despite these difficulties, there are several reasons why assessing these skills remains desirable. The first is related to the function of assessment in order to improve learning and make appropriate decisions about future learning goals – such decisions are taken by the student, teacher, administrator, or other stakeholders. A second related function of assessment is to make student learning visible. An additional important function of assessment is ‘diagnostic’. In this regard, assessment is part of a process used to determine students’ strengths and weaknesses in relation to educationally valuable competencies. As such, it provides a way to identify the nature and extent of difficulties in a student’s learning. To use assessment to support student learning, we need to design tasks that allow this information to be disentangled, decoded and interpreted in a valid and reliable way. There is a large body of work associated with higher education and/or professional learning, which describes how particular strategies or activities can be used to develop deeper or more complex levels of reflection. To illustrate key ideas from this body of work, evidence-based strategies include:

- reflective journaling [1], both unstructured and structured (more explicitly guided) and portfolios;
- formal reflection papers;
- group memory work.

Non-traditional modes of assessment such as the demonstration of reflective practice through journals and portfolios tend to be the preferred option for evidencing personalised learning [20]. Ovens and Tinning [21] describe a socio-cultural process of small group memory-work, which involves interpreting participants’ subjective experiences through an iterative process of individual and collective analysis of participants’ written memories.

One development which has great potential when considering the assessment of hard to measure constructs is the increased use of technology. As Mislevy and colleagues [22] point out, advances in technology have the potential to reconceptualise what we regard as knowledge and how it can be elicited. For example, the Evidence Centred Design (ECD) approach provides a framework for developing assessment tasks that are explicitly linked to claims about personal competencies via an evidentiary chain, that is, valid arguments that serve to connect task performance to competency estimates, and are thus valid for their intended purposes. One shift in focus has highlighted the use of e-portfolios to collect information about candidates that could allow the assessment of reflection, and the development of ideas.

1.2 Context

Cambridge International Examinations (Cambridge) is a UK based international awarding which provides primary and secondary programmes to approximately 10 000 schools in more than 160 countries worldwide. The structure of programmes offered by Cambridge follows a UK educational system which includes the stages of primary, secondary 1, secondary 2 and advanced stages of education (Fig. 1).

Cambridge Primary, typically for students aged 5 to 11 years, gives schools a curriculum to develop children’s skills in English, mathematics and science. Cambridge Secondary 1 develops the same set of skills and knowledge further, for the first three years of secondary education (typically for students aged 11 to 14 years). These two programmes enable teachers to assess children’s learning as they progress with two optional assessments: Cambridge Primary/Secondary 1 Progression Tests and Cambridge Primary/Secondary 1 Checkpoint.

Cambridge Secondary 2 is usually for students aged 14 to 16 years and offers students two routes: IGCSE (International General Certificate of Secondary Education) and O-Levels General Certificate of Education Ordinary Level. The programmes offered in this stage build on the foundations of Cambridge Secondary 1, although students do not need to complete the Secondary 1 stage before
Secondary 2. At the end of their IGCSEs or O-Levels students take exams in the chosen subjects, which are then internally and externally assessed. Cambridge offers IGCSE programmes in over 70 subjects and about 40 O-Level subjects.

*Cambridge Advanced* is a pre-university stage which prepares students (usually aged between 16 and 19) for university and higher education. Cambridge offers two routes of advanced programmes: *Cambridge International AS & A Level* and *Cambridge Pre-U*. Students have a choice of 55 AS and A-Level, and 25 Cambridge Pre-U subjects. They have the freedom to take these subjects in almost any combination. These programmes develop a deep understanding of subjects and a variety of skills important for further academic and professional development.

### 1.3 Reflection as part of the Cambridge Global Perspectives Programmes

Cambridge Global Perspectives (GP) courses are designed to equip students with twenty-first century skills. According to each of the GP’s programmes, these courses aim to enable learners to develop research, analysis, evaluation, reflection, communication and collaboration skills from the age of 5 up to university entry. Cambridge seeks to ensure that these skills are nurtured continuously in the classroom from an early age until the end of the secondary education. The GP courses offered by Cambridge are skills-based, which means that the focus of the programme is on providing learners with skills to search, handle, interpret, present and apply the information, rather than on the information itself.

In particular, GP programmes focus on three main groups of skills: (1) Research, Analysis and Evaluation, (2) Reflection, and (3) Communication and Collaboration. These skills are taught and assessed through tasks which elicit these behaviours. Cambridge explicitly assesses reflection on the study material and self-reflection through a set of tasks which are appropriated for particular age. As demonstrated in Table 1 Cambridge explicitly assesses reflection through a set of tasks that elicit these behaviours.

<table>
<thead>
<tr>
<th>GP programmes components</th>
<th>Assessment Objectives</th>
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<tbody>
<tr>
<td></td>
<td>Research, analysis and evaluation (%)</td>
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<tr>
<td><strong>Primary GP</strong></td>
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<tr>
<td>Team project</td>
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<td>Evidence of action</td>
<td>10</td>
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<tr>
<td>Team report</td>
<td>20</td>
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<tr>
<td>Personal reflection</td>
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<tr>
<td><strong>Secondary 1 GP</strong></td>
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<tr>
<td>Research report</td>
<td>80</td>
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<tr>
<td><strong>IGCSE GP</strong></td>
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<tr>
<td>Written examination</td>
<td>100</td>
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<tr>
<td>Individual report</td>
<td>67</td>
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<tr>
<td>Team project</td>
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<tr>
<td>Team element</td>
<td>-</td>
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<td>- Collaboration</td>
<td>-</td>
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<tr>
<td>- Outcome</td>
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<tr>
<td>Personal element</td>
<td>33</td>
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<tr>
<td>- Reflective paper</td>
<td>-</td>
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<tr>
<td><strong>AS and A Level GP &amp; R</strong></td>
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<tr>
<td>Written examination</td>
<td>100</td>
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<tr>
<td>Essay</td>
<td>57</td>
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<tr>
<td>Team project</td>
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<tr>
<td>Presentation</td>
<td>80</td>
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<tr>
<td>Reflective paper</td>
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<tr>
<td>Research report</td>
<td>80</td>
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1.3.1 Primary General Perspectives (GP) Checkpoint

For their final assessment, and with the support and guidance of their teacher, learners work as a team to identify local issues they would like to improve, change or resolve. They explore different local perspectives about these issues in order to identify one issue to focus on. The team conducts research on this issue which is used to set a goal to improve, change or resolve the issue. The team then agrees on a local action to take which is likely to achieve this goal. This local action will be communicated in the Evidence of Action (e.g. poster, information leaflet, brochure, website, and so on). Once the local action has been taken, learners work collaboratively to complete a Team Report.

Each student also submits a Personal Reflection in which they outline the strengths and limitations of their contribution to the team, as well as benefits and challenges of working together as a team. Students also reflect on:

- How their thoughts on issues developed, and
- How their personal behaviour or the behaviour of others has changed as a result of the research they conducted, taken actions and the team work.

1.3.2 Secondary 1 General Perspectives (GP) Checkpoint

For the final assessment, students work individually to write a Research Report on one of the Secondary 1 topics. With the help of their teachers they identify the topic they wish to research, and plan the research project in order to answer their research question. Apart from their analysis, synthesis and collaborative skills, the report equally aims to assess students’ reflection. They are required to reflect insightfully on how their view on the issue has changed or developed, as a result of this research project.

1.3.3 IGCSE General Perspectives (GP)

Final examination for the IGCSE GP consists of a Written Examination on a given topic, Individual Report and a Team Project. Team Project component has two parts: a Team Element and Reflective Paper. The Reflective Paper and Individual Report assess students' reflection.

In Individual Report students choose from one of the specified topic areas and devise a global question. Each student carries out research on a global question; they should consider issues within the topic and give different viewpoints within these. Students are encouraged to engage with these perspectives and to demonstrate that they understand the arguments, reasoning or claims upon which these perspectives are based. They are asked to reflect on these perspectives, but also on their own reasoning and viewpoints.

The Reflective Paper assesses students' reflections on their own research work, contribution to the team and personal learning experience. For example, students should be able to consider other perspectives objectively and justify their own personal perspectives using evidence and reasoning. They are also encouraged to consider how research and engagement with different perspectives and working as part of a team, have influenced personal learning.

1.3.4 AS and A-Level General Perspectives and Research (GP & R)

AS and A-Level exam comprises 4 components: Written examination, Essay, Team Project (which consists of Presentation and Reflective Paper), and Cambridge Research Report. Students taking the AS exam do not produce the fourth component Research Report. Three of these components aim to elicit and assess reflective thinking in students.

As part of the Essay, students are asked to explore different perspectives on issues of global significance arising from their studies during the course.

In the Reflective Paper each student is expected to explain team solutions while reflecting on different perspectives from the team and their own perspectives and potential change of perspectives. Here, students should evaluate the effectiveness of their work with others in a team to identify an appropriate local problem with global relevance, consider the ways in which personal standpoints may have been affected by the research and collaborative experience.

In the final Research Report, students are asked to reflect on the scope, nature and limitations of their own research, and how and why their own personal viewpoints on the researched issues might have changed.

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2 EVALUATION AND TEACHING OF REFLECTIVE THINKING

2.1 The role of technology

2.1.1 E-portfolios

E-portfolios have been identified as a valuable learning and assessment tool, in which artefacts, resources and accomplishments can be represented at either an individual, group or institution level [23]. Lorenzo and Ittleson [23] argue that e-portfolios can both encourage personal reflection and the exchange of ideas and feedback. E-portfolios can also provide a personalised online learning space [24] where "learners can store their work, record their achievements (a repository function), and access personal course timetables (an organising function), digital resources relevant to their own study (personalised information) and links to other learners (for collaboration and feedback)" [25, p. 1]. Daunert and Price [26, p. 231] point out that "e-portfolios are practical tools for supporting self-directed and reflective learning".

E-portfolios are a useful tool which encourages a greater degree of reflection [27], which is a key component in the GP&R qualification. E-portfolios are understood to enhance reflection because they honour the process not the product [28]. The power of this reflection is partly visual, in that students get feedback on areas of the portfolio that are light on content, and partly directed from teachers by using prompts.

E-portfolios go beyond merely being a repository for collecting digital items but have potential to generate a process for reflecting on deeper learning. Reflection is a formative process as "it explains the reasons why a student chooses a particular artefact for the portfolio, helping students to understand how they learn and what they have learned" [29, p. 1].

The Cambridge e-portfolio facility within the online learning environment is currently being used as a pedagogical tool by schools. It is used as a means to share research, ideas, ask questions and for getting feedback from teachers and peers. Both students and teachers use e-portfolios as a place for the students to organise and present their ongoing work. Students build their own e-portfolio pages and embed their study material. The e-portfolio is not assessed, but encouraged as a means to enhance students' reflective power and management skills. E-Portfolios afford reflection in a variety of ways including journals, blogs, discussions and presentations.

2.1.2 Reflective journals

Students are also encouraged to keep a reflective journal throughout their course. The purpose of these journals is to note their perspectives, learning process, motivation throughout the project and development of skills. Students have the opportunity to record their own personal individual reflections via their online platform, but also reflections on the work done within the team. They are also encouraged to use these notes for their final report.

This kind of on-going self-reporting allows for a more authentic record of reflective thinking, which does not require students to rely on their memory about past events. Students are practicing these skills while working on a variety of topics of global and local relevance, but also learning to record their reflective thoughts in a form of a journal.

2.2 The role of teachers

A range of teaching approaches are embodied within the Cambridge GP programme. For example, the concept of Vygotskian scaffolding is in the core of the Cambridge pedagogical approach. This approach emphasises the supportive and guiding role of the educator in the learning process. Teachers do not explicitly teach skills such as reflection, they encourage and support them and provide topics and organise activities which elicit these skills. The prompts that teachers use will therefore scaffold the development of skills to ensure ‘cognitive change’ in students. GP programmes incorporate a range of teaching approaches that stem from Vygotsky’s socio-cultural theory [30] of development; enquiry learning, collaborative work, verbalisation of internal metacognitive processes (which make self-reflection possible). These approaches give students considerably more freedom in relation to pursuing their own interests [31] and in regards to becoming more self-reflective and self-regulated, independent learners, who are able to successfully collaborate and cooperate with others. These approaches also make the process of learning explicit and visible.
In addition to encouraging student verbalisation (both oral and written), GP programmes emphasise teachers' role in providing explicit examples of reflective metacognitive thinking, and verbalisation of a variety of successful self-regulatory strategies. Research shows that this kind of teacher-student interactions is a strong predictor of academic success [32].

More explicitly, as part of the GP programmes, teachers facilitate, support and guide students to:

- Understand the nature of the task,
- Propose a project,
- Identify a suitable local issue and action,
- Develop organisational and time/project management skills, and
- Develop critical thinking skills.

Cambridge comprehensive teacher support available on-line and off-line is provided to help teachers to plan and deliver the programme effectively and with confidence. For example, a Scheme of Work provides teachers with a variety of ideas on how to deliver the course. Also, teachers have access to resource lists to support their teaching, including textbooks and websites. Further, Cambridge provides a variety of workshops globally to support teachers in delivering programmes and offers a self-study and tutor-led on-line training courses via virtual learning environment. Finally, there are plenty of opportunities for teacher for continuing professional development.

Apart from facilitating, supporting and guiding students' reflection and overall learning throughout the courses, teachers also assess students' work. For Primary and Secondary 1 GP programme, teachers assess the final exams, which are externally moderated by Cambridge. IGCSE and AS and A-Level final assessments are marked in part by teachers and in part by Cambridge.

3 CONCLUSIONS

Cambridge GP programmes aim to equip the students from a very early age with metacognitive and reflective thinking skills. Despite the difficulty of capturing these hard-to-measure skills, Cambridge have developed an assessment model that successfully captures students' reflection skills. Students are offered Global Perspectives programmes, which focus on the development of 21st century skills, from the primary to pre-university level of education. Students' reflective thinking skills are recorded through their e-portfolio and reflective journals throughout the course, and used for their final examination at the end of the programme.

Cambridge also emphasises the role of teacher in a scaffolding process, where they act as facilitators of reflection skills, rather than providers of "correct" knowledge and skills.

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