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A four-category scheme for coding and assessing the level of reflection in written work

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Where courses have as an aim the promotion of reflective practice, it will enhance the achievement of the goal if the level of reflective thinking is assessed. To do this in a satisfactory way requires a reliable protocol for assessing the level of reflection in written work. This article presents a protocol that can be used to guide the allocation of work to four categories, namely: habitual action/non-reflection, understanding, reflection, and critical reflection. Intermediate categories can also be used. Detailed descriptors of each category to guide the process are provided. The protocol was tested by four assessors independently using it to grade a set of written work, and very good agreement was obtained.

Reflection

Many courses cite goals related to promoting reflective thinking or developing the ability to reflect on practice. This is particularly true in professional degrees. Schön (1983) argued that expert practitioners in a profession were distinguished from novices by their ability to reflect on their practice when dealing with unusual or particularly complex cases. The logical corollary is that, to ensure adequate preparation for a professional career, programmes need to cultivate the ability to reflect on practice (Schön 1987).

It is also arguable that all degrees should promote reflective thinking since it is necessary to make reflective judgements to deal with ill-defined problems. This is surely a generic capability that is needed by graduates in knowledge-based societies.

The nature of reflection

What is perhaps surprising, in spite of the wide interest in reflection and the volumes written about it, is that the concept is ill defined. Formal definitions are not easy to find as has been observed by Atkins and Murphy (1993) and Sparks-Langer et al. (1990) among others. Many write about reflection with the apparent assumption that everyone knows what it is. However, the disparities in terminology, frames of reference, applications and usage make it clear that this assumption is not helpful.

There is an element of confusion within the literature because the concept has become so widely and diversely used that it is now found within quite disparate contexts and based on divergent frames of reference. As a result, a number of quite discrete areas of literature

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have developed depending on the context in which the work is situated and the tradition and discipline on which the writer draws.

The origins of the concept of reflective thinking are normally attributed to Dewey (1933), who wrote of it as a thought process that education should strive to cultivate. Subsequently, discrete strands have emerged in the literature. King and Kitchener (1994) argued that reflective judgement is a quality that college students need to develop in order to recognize and deal with ill-defined problems. Schön's (1983) work is situated in the realm of professional practice, leading to descriptions of the reflective practices employed by professionals in a number of fields. Schön's (1987) work on educating professionals for reflective practice has been highly influential in professional education, but it needs adaptation and development because the studio education model featured by Schön is quite different from most professional education.

Several writers in the field of adult education, most notably Mezirow (1981, 1991, 1992), have derived categorical descriptions of reflection from critical theory. Others with backgrounds in adult education, such as Boud and collaborators (1985, 1991) and Jarvis (1987, 1992, 1995), have taken a more experiential approach to propose models of reflective thinking processes.

Synthesized definition

In Kember et al. (2001) we attempted to integrate college-based education with professional practice, so felt it necessary to draw on each of these contextually defined treatments of reflection and attempt a synthesized definition. The following quotation is taken from the conclusion of Kember et al. (2001). It combines the summary of a literature review on the nature of reflection with insights into the construct gained from the series of research studies described in the book:

- The subject matter of reflection is an ill-defined problem – the type of issues and cases dealt with in professional practice.
- In professional practice the process of reflection may be triggered by an unusual case or deliberate attempts to revisit past experiences.
- Reflection can occur through stimuli other than problems or disturbances to the normal routine. The stimuli may be encouraged or arranged.
- Reflection operates through a careful re-examination and evaluation of experience, beliefs and knowledge.
- Reflection most commonly involves looking back or reviewing past actions, though competent professionals can develop the ability to reflect while carrying out their practice. (174)

The review of Kember et al. (2001) also recognized a higher level of reflection:

- Reflection operates at a number of levels; the highest level of critical reflection necessitates a change to deep-seated, and often unconscious, beliefs and leads to new belief structures.
- Reflection leads to new perspectives.
- More critical reflection, involving perspective transformation, is likely to take some time so there will be significant periods between initial observations and final conclusions. (174)

Assessing the level of reflection

Given that students are assessment driven (Thomas and Bain 1984; Biggs 1999), if courses are to be consistent with goals of promoting reflection, a significant part of the assessment needs to be assessing the ability to think reflectively, make reflective judgements or reflect on practice. This in turn implies the need for teachers to determine whether or not students are reflecting on practice and to judge the level of reflection displayed in assignments.

Assignments that call for reflection normally seek written responses. Examples would be reflective journals, judgements on case studies and contributions to online discussion forums. If teachers are to assess levels of reflection, they therefore need a means of determining the level of reflection in a piece of writing. Such a scheme will obviously not provide a precise measurement, but will provide guidance in making judgements, so decreasing the level of subjectivity.

Schemes for categorizing reflective writing

In the course of research into reflection we searched for suitable schemes. Of the schemes we examined, Sparks-Langer et al. (1990) reported a seven-level framework based on the type of language used by students. The authors describe the levels in the coding scheme as a mirror of Gagné's (1968) hierarchy of thinking. The method was well documented but the levels equated more to the linguistic structure of discourse than to commonly accepted models of reflective thinking.

Powell (1989) presented two analyses of interview transcripts using a six-category scheme based on Mezirow (1981) and a five-category scheme derived from Colaizzi (1973). However, the paper gave no details of the coding procedure and reported no attempt to determine the reliability or validity of the coding process. Hahnemann (1986) reported a method for assessing the content of journal entries. The focus was whether the answers to questions were correct, rather than whether there was evidence of reflective thinking.

Our previous schemes

As there did not seem to be a scheme that suited our purposes, between us we have made several attempts over the years to develop a suitable scheme for assessing the level of reflection in written work. We believe the one explained in this article is the culmination of this development work. During this period of research into reflection we have also gained greater insights into the nature of reflection (Kember et al. 2001). This enables us to provide better descriptors of levels or categories within a protocol for assessing reflection.

Wong et al. (1995) described a scheme, based on the writing of Boud et al. (1985) and Mezirow (1991). The protocol required judges to identify instances of the use of elements of Boud et al.'s (1985) model of reflection. These were: attending to feelings, association, integration, validation, appropriation and outcomes of reflection. Students were then classified into three categories of: non-reflector, reflector and critical reflector.

The two-stage process for this scheme makes it harder to employ as a protocol for those not familiar with the literature. The Boud et al. (1985) model of reflection is narrow in application. The elements in the model would not apply to many of the instances where students are required to make reflective judgements in non-professional programmes.

Kember et al. (1999) described a protocol with seven categories, based on the writing of Mezirow. The main reference was to Mezirow (1991) but there was some reference to other

work (Mezirow 1977, 1985, 1992). The limitation of this protocol was that the seven categories were too fine-grained. A simpler scheme with fewer categories would be easier to follow for those without detailed knowledge of the literature on which the categories were based.

Kember et al. (2000) then developed a questionnaire to measure levels of reflective thinking. The questionnaire had four scales: habitual action, understanding, reflection and critical reflection. Testing of the questionnaire with confirmatory factor analysis indicated a very good fit to a four-factor model. The scales of the questionnaire were subsequently shown to relate in a logical way (Leung and Kember 2003) to those measuring approaches to learning in the revised version of the Study Process Questionnaire (Biggs et al. 2001).

The questionnaire thus provides empirical evidence that the most viable scheme for assessing the level of reflection in writing is likely to have four categories: habitual action/non-reflection, understanding, reflection and critical reflection. Having developed a questionnaire with four categories, which had been tested successfully for reliability and validity, we desired consistency between our quantitative and qualitative ways of determining levels of reflection. We have therefore developed a four-category scheme for determining levels of reflection in written work. The scheme uses the same four categories as the questionnaire:

- habitual action/non-reflection;
- understanding;
- reflection;
- critical reflection.

Assessment of part or whole of paper

One insight that came through from the series of studies was that assessment or coding of level of reflection should be performed at the whole-paper level. Attempting to assess levels of reflection of sections within a paper or journal entry was not a fruitful exercise.

Pieces of writing normally consist of parts that go together to make a whole. A typical journal entry might contain an introduction, a description of the setting, a recall of an experience, an examination of relevant theory and a reflection on personal insights gained. The first parts are essentially supporting material and will be largely non-reflective. The conclusion is likely to show any reflection.

We therefore recommend that the normal procedure in assessing the level of reflection is to examine the whole paper to find the highest level of reflection. The judgement on the overall paper will then be that it is at that level of reflection. This procedure is consistent with the most common approach to allocating categories in qualitative research (e.g. Marton et al. 1993).

Descriptions of the four categories

A successful categorization scheme needs a good description of each level if it is to be followed successfully. Those who use it need guidance in assessing the level of a piece of writing. The remainder of this section, therefore, constitutes a description of the four levels of reflective thinking and how they are likely to be manifest in written form. The account attempts to include professional practice, student practice in the professional situation and other university work not related to professional practice.

Habitual action

In professional practice, habitual action occurs when a procedure is followed without significant thought about it. Expert practitioners will do this with routine cases. Similar ones have been dealt with many times before, so dealing with others becomes almost automatic. Novices in practice situations can behave non-reflectively by rigidly following the steps of procedures they have been taught. No thought is given to applicability or alternatives.

Habitual action or non-reflection occurs when a student responds to an academic task by providing an answer without attempting to reach an understanding of the concept or theory that underpins the topic. Such a response is consistent with a surface approach to learning, but the two constructs are not equivalent.

Non-reflective thinking commonly occurs in response to numerical problems. Students can substitute numbers into formulae and manipulate them algebraically to calculate the value for a variable, without any real understanding of the physical meaning of the concept. Laboratory experiments can be performed and written up by following the steps in the laboratory manual without the student understanding the principles behind the experiment.

Non-reflective writing occurs when students search for material on a set topic and place it into an essay without thinking about it, trying to understand it, or forming a view. At times the material is wholly or partially plagiarized. It is also common for it to be paraphrased or summarized quite legitimately without any sense of meaning or real understanding of the underlying constructs.

Understanding

As the name suggests, the understanding category is distinguished from the habitual action one by the student attempting to reach an understanding of a concept or topic. When reading the student searches for the author's underlying meaning. A deep approach to learning is, therefore, employed.

The category, however, does not imply reflection. This means that the understanding is somewhat truncated. The concepts are understood as theory without being related to personal experiences or real-life applications. As such they have no personal meaning and may not be assimilated into an individual's knowledge structure. Retention of the knowledge can, therefore, be for a limited period.

This limited level of thinking commonly occurs with undergraduates who lack experience. Concepts are learnt from a book without an understanding of how they might be applied in practice. The form of learning is a common outcome of lectures that are restricted to theory without showing relevance or application.

In students' writing the understanding category is manifested in a reliance on what was in the textbook or the lecture notes. There will be a correct rendition of theory. In the absence of reflection, though, there will be no examples of how the theory related to a practical situation. Nor will consideration be given to how the concept relates to personal experiences.

Reflection

In the introduction there is a detailed discussion of the diverse literature defining reflection and a synthesized summary taken from Kember et al. (2001). Reflection can be delineated from the understanding category because the process of reflection takes a concept and considers it in relation to personal experiences. Theory is applied to practical applications.

As a concept becomes related to other knowledge and experience personal meaning becomes attached to the concept.

In writing, the reflection category goes beyond the understanding category by showing the application of theory. Concepts will be interpreted in relationship to personal experiences. Situations encountered in practice will be considered and successfully discussed in relationship to what has been taught. There will be personal insights that go beyond book theory.

Critical reflection

This higher level of reflection is most commonly called *critical reflection*, and again the introduction provides a synthesized definition. Dewey (1933) distinguished between critical reflection and less considered reflection, suggesting the latter might result from a hasty decision reached without examining all possible outcomes.

Mezirow (1991) provided a more useful definition of the higher level of reflection, though called it premise reflection. Mezirow's explanation of premise reflection is derived from critical theory and the work of Habermas (1970, 1972, 1974). Premise or critical reflection implies undergoing a transformation of perspective. Many of our actions are governed by a set of beliefs and values that have been almost unconsciously assimilated from our experiences and environment. To undergo a change in perspective requires us to recognize and change these presumptions. To undergo critical reflection it is necessary to conduct a critical review of presuppositions from conscious and unconscious prior learning and their consequences.

Conventional wisdom and ingrained assumptions are hard to change, in part because they become so deeply embedded that we become unaware that they are assumptions or even that they exist. Mezirow (1990, 1998) clearly recognized the difficulty of perspective transformation. Critical reflection is, therefore, unlikely to occur frequently. This would be particularly true of topics that are central to our main activities. Professionals would not commonly undergo critical reflection on their everyday work as this would be influenced by the greatest store of, and the most deep-seated, beliefs. Critical reflection would be more common for students who were still learning about a subject or profession and are yet to form ingrained conceptions.

Nevertheless, undergraduate students often form deep-seated beliefs about phenomena. The science education literature is replete with examples of students continuing to interpret phenomena in terms of earlier less sophisticated theories, despite having been taught later more sophisticated developments (Osborne and Wittrock 1983). The students manage to construct individual meanings around their existing naive framework, out of the new information, rather than adopt a new conceptual model. In many instances the students' conceptual framework coincides with historically older scientific theories rather than more recent ones taught in their lessons.

Changing these beliefs about phenomena can be difficult for both teacher and student. Nussbaum and Novick (1982) and West (1988) suggest that a three-phase process is required to bring about conceptual change so that the students truly incorporate the newer models into their belief structures. The steps for this perspective transformation can be seen as closely resembling those which would prompt a professional to critically reflect on an unusual case:

- (1) A process for diagnosing existing conceptual frameworks and revealing them to the student.

- (2) A period of disequilibrium and conceptual conflict which makes students dissatisfied with existing conceptions.
- (3) A reconstruction or reforming phase in which a new conceptual framework is formed.

To classify a piece of writing as showing critical reflection, there should be evidence of a change in perspective over a fundamental belief. There is likely to be evidence of the process taking time and displaying the type of steps described above. This is unlikely to be a common outcome.

Trial

Deriving the categories from such an extensive body of literature can be seen as a way of establishing their validity. The next step was to examine the reliability of the procedures. To test the reliability of the reflection levels as appropriate for marking student work a trial was conducted. The trial was in conjunction with a radiography course, which included a clinical placement. One of the principal aims of the programme, and particularly the clinical placements, is the promotion of critical thinking. It was, therefore, an appropriate assignment for the use of the protocol.

The students' work was a critical incident report prepared and taking as the subject an incident the student had noted during a specific period of clinical placement that fitted into one of the following areas:

- any incident that was non-routine and presented an issue requiring a decision;
- a situation that required improvisation or innovation;
- changing a procedure; or,
- one that was emotionally, physically or mentally demanding in some way.

Incidents could be related to technological, procedural, psychological, management or ethical demands.

Four papers were selected, which had originally been graded, using conventional subjective marking, in the range from A to D. The papers were passed to a group of academic colleagues in the same professional group as the students. They were invited to grade each paper according to the four-category scheme discussed in this paper.

The academic colleagues were each provided with a copy of the four papers, minus any student identification or knowledge of the grade awarded. In addition they were given the requirements for the assignment the students had received and a copy of a document with a

Table 1. Category assigned to the assignments by the assessors.

Original Non-grade	Non-reflection	Transitional Understanding	Transitional Reflection	Critical reflection
1. A				A1, B1, C1, D1
2. D+	A2, B2, C2, D2			
3. B		A3	B3, C3, D3	
4. C+		D4	A4, B4, C4	

Note: Reviewers are noted as A, B, C and D; Papers are numbered 1, 2, 3, 4.

brief summary of the descriptions of the four categories of habitual action, understanding, reflection and critical reflection (see Appendix 1). They were asked to assess each of the four critical incident reports according to the four reflection levels.

They were informed that it was possible to give a transitional grade between reflective categories, for example, if they felt the assignment did not fit completely within one or other of the categories. They were advised that it was not necessary to spend a long time scrutinizing each assessment, as experience has suggested that the first impression was most often accurate. The assessment results, including the initial assessment grades, are shown in Table 1.

It can be seen that there is very good agreement among the assessors. On one assignment there was perfect agreement on the assigned category. On the other three assignments, three assessors concurred and the other was within the adjacent transitional category. The level of reflection protocol can, therefore, be considered to be very reliable in operation.

Use of the protocol

The protocol provides guidance to teachers in assessing the level of reflection in written work. It should be usable with journal entries, essays and contributions to discussions on a Web forum.

The teacher or assessor needs to be familiar with the descriptions of the four categories listed above. The category descriptors then provide guiding criteria for assessing the level of reflection demonstrated in each piece of writing. The written work should be treated as a whole and the judgement should reflect the highest level observed.

It is unlikely that all pieces of work will fit neatly into one of the four categories. As with any qualitative categorization or coding scheme, intermediate cases are inevitable.

The levels of reflection can be translated into grades if necessary, in which case a form of criterion-based assessment is used. The most obvious grading scheme is:

- A critical reflection;
- B reflection;
- C understanding;
- D non-reflective.

Pluses and minuses can be used to cater for intermediate cases.

Published schemes that provide criteria for assessing qualitative writing are not common, presumably because of the difficulty of providing generic criteria. The most commonly cited is probably the SOLO taxonomy (Biggs and Collis 1982). This is a five-category scheme based on the structure of the writing. The reflection scheme described here, therefore, provides a useful complement to the SOLO taxonomy.

Readers may also wish to use one or both of these protocols in conjunction with discipline- or assignment-specific criteria. Assignments are often set to examine several qualities, so it makes sense to use multiple criterion-based marking schemes.

The protocol can also be used for evaluation and research purposes. If a course aims to promote reflection, the most direct way of evaluating its effectiveness is to determine to what extent students are engaging in reflection. The protocol can also be used in research that needs to measure reflection as an outcome. Readers are welcome to use the above descriptors of the four categories as a guide to allocating written work to those categories.

This article has included reasonably succinct descriptions of four categories of reflective and non-reflective thinking, which enabled assessors to allocate written work to four

categories with a very high level of agreement. Reflection is a construct that has not been well-defined, and research on the topic has suffered to some extent because of this lack of clarity. The descriptions of the four categories may, therefore, be of some value as defining descriptions of these types of thinking.

Notes on contributors

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Kit Sinclair has been using reflective journaling with occupational therapy students in Hong Kong and continues to promote these concepts in her present research activities in applied and professional learning.

Frances Kam Yuet Wong is a professor in nursing at the School of Nursing at Hong Kong Polytechnic University. Her major research and teaching areas are advanced nursing practice, reflective practice and problem-based learning.

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Appendix 1: Summary of the four categories, as supplied to the assessors in the trial

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Readers are welcome to reproduce this summary for purposes of assessment or research.

Non-reflection

- The answer shows no evidence of the student attempting to reach an understanding of the concept or theory which underpins the topic.
- Material has been placed into an essay without the student thinking seriously about it, trying to interpret the material, or forming a view.
- Largely reproduction, with or without adaptation, of the work of others.

Understanding

- Evidence of understanding of a concept or topic.
- Material is confined to theory.
- Reliance upon what was in the textbook or the lecture notes.
- Theory is not related to personal experiences, real-life applications or practical situations.

Reflection

- Theory is applied to practical situations
- Situations encountered in practice will be considered and successfully discussed in relationship to what has been taught. There will be personal insights which go beyond book theory.

Critical reflection

- Evidence of a change in perspective over a fundamental belief of the understanding of a key concept or phenomenon.
- Critical reflection is unlikely to occur frequently.

N.B. Intermediate categories are permitted.