

Original Article

Getting the measure of reflection: considering matters of definition and depth

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Abstract

Reflection, reflective learning, reflective writing and reflective practice are used increasingly in higher education and professional development—but we do not work to one definition and there are considerable differences in the views of educationists on issues of definition. Such discrepancies can exist between the staff working with the same student group. The situation can lead to difficulties in indicating to students how to reflect, and what reflective writing 'should look like'. Once students do manage to represent their reflection broadly in the required manner (usually writing), there is frequently observed to be a further problem because their reflection is superficial and descriptive. A consequence is that their learning from the reflective process is restricted.

This paper addresses the issue of definition of reflection initially through clarifying the different words used around the notion of reflection (e.g., reflection, reflective learning, reflective writing) and providing some suggested definitions. It then addresses the matters both of how we should help students to start with reflection, and with the problem of the superficiality of much of their work. The 'depth' of reflection is a concept that has not been much discussed in the literature of reflection and yet it seems to be closely related to the quality of reflective work. The paper discusses the concept of depth and then introduces a style of exercise in which a scenario is reproduced at progressively deeper levels of reflection. The exercise is related to a generic framework for reflective writing. The rationale and justification for the exercise and the framework are discussed and suggestions are made for its manner of use. The exercise and the generic framework for reflective writing are in Appendices 1 and 2.

The use of reflection to enhance formal learning has become increasingly common in the past 7 years. From the principle beginnings of its use in the professional development of nurses and teachers, its use has spread through other professions. Now, in the form of personal development planning (PDP), there is an expectation that all students in higher education will be deliberately engaging in reflection in the next 2 years.¹ In addition, there are examples of the use of reflective learning journals and other reflective techniques in most, if not all, disciplines.²

Reflection is not, however, a clearly defined and enacted concept. People hold different views of its nature, which only become revealed at stages such as assessment. For example, what is it that differentiates reflective writing from simple description? There are difficulties not only with the definition itself but also in conveying to learners what it is that we require them to do in reflection and in encouraging reflection that is deeper than description. In this paper, we consider some issues of definition and then focus on the means of encouraging learners to produce a reflective output of good-enough quality for the task at hand.

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The latter is presented as an exercise for staff and learners (Appendix 1) with a framework that underpins it (Appendix 2).

Keywords

definitions of reflection; reflection; reflective writing

ISSUES OF DEFINITION

There is a bewildering array of academic definitions and implied definitions for reflection in the literature. However, there does seem to be a pattern to this.³ In terms of a definition for reflection, it is important first to recognise that there are a number of words around the idea of reflection, which have different implications. For example, 'reflection' and 'reflective learning' seem to be words that describe an internal process in contrast to 'reflective writing', which is a representation of reflection, but, like any other form of representation, it is not a direct representation of the internal process. The same internal reflection might be represented as writing, in speech, in a drawing, in an audio or visual diary and so on, and different aspects of the reflection would be evident in the different representations.⁴ While reflection and reflective learning seem to be the same, the process is extended significantly in reflective writing or other representations of reflection. 'Reflective practice' is another linked term, and seems generally to be used to describe a broader process in which there is a habit of reflecting (and—usually—representing that reflection) on aspects of a subject's activity, in order to improve the practice. In other words, the term is broadened into a sequence of activities, which now include the notion of action and improvement of practice as well. However, a realistic view of reflective practice is also that it is a construct defined differently in different contexts—and hence its definition is the manner in which it is defined locally.

In seeking definition of the terms for 'reflection', we first need to acknowledge the existence of the commonsense term—the 'sitting pensively under the apple tree on a hot day...' view. To define 'reflection' away from its commonsense conception would be confusing. Following

exploration of the concept of reflection and reflective learning, Moon³ produced the following definition:

Reflection is a form of mental processing—like a form of thinking—that we may use to fulfil a purpose or to achieve some anticipated outcome, or we may simply 'be reflective' when an outcome may be unexpected. Reflection is applied to relatively complicated, ill-structured ideas for which there is not an obvious solution and is largely based on the further processing of knowledge and understanding that we already possess.

However, this definition needs to be extended when reflection is employed in formal education. This is because reflection, in a formal context, usually implies both processes of reflection and the representation of reflection. Also the reflection usually occurs under constraints and conditions that shape the learner's reflective processes and responses. Therefore, in a formal context, we add to the commonsense definition of reflection the following:

Reflection/reflective learning, or reflective writing in the academic context, is also likely to involve a conscious and stated purpose for the reflection, with an outcome specified in terms of learning, action or clarification. It may be preceded by a description of the purpose and/or the subject matter of the reflection. The process and outcome of reflective work is most likely to be in a represented (e.g., written) form, to be seen by others and to be assessed. All of these factors can influence its nature and quality.

In practice, the way in which even the definition of reflection is used in educational situations is often quite narrowly defined. For example, it

may be defined in terms of learning from recognised error or ineffectiveness in practice^{5,6} and it is often subject to constraining beliefs, for example, that reflection is only focused on the self. People are often not aware that their understandings of the term are so constrained.

Defining reflection in the ‘process’ manner above does not, however, account for many references to reflection in the literature. On a close look at the manner in which ‘reflection’ is described, Moon¹ concluded that most writers are concerned with the outcome of the act of reflection and not the process—and that it is this distinction that appears to account for the diversity of definition. Some of the outcomes of reflection that are cited in the literature are the following:

- learning, knowledge and understanding
- some form of action
- a process of critical review
- personal and continuing professional development
- reflection on the process of learning or personal functioning (metacognition)
- the building of theory from observations in practice situations
- the making of decisions/resolution of uncertainty, the solving of problems; empowerment and emancipation
- unexpected outcomes (e.g., images, ideas that could be solutions to dilemmas or seen as creative activity)
- emotion (that can be an outcome or can be part of the process)
- clarification and the recognition that there is a need for further reflection and so on.

Although ‘learning’ (as above) is deemed to be an outcome of reflection in its own right, we could say that all of the outcomes in the list are concerned with how we use understanding and knowledge to achieve other purposes. In other words, these factors link reflection with the process of learning.

As an addendum to this section on definition of reflection, it might be appropriate to add what must be the definitive definition of reflection as developed in wizardry. The ‘pensieve’, as used in

the Harry Potter books, conceives of reflective activity in a very helpful metaphor that has its uses in the teaching context:⁷

Harry stared at the stone basin . . .

‘What is it?’, Harry asked shakily.

‘This? It is called a pensieve’, said Dumbledore. ‘I sometimes find, and I am sure that you know the feeling’, that I simply have too many thoughts and memories crammed into my mind. . . . At these time’s, said Dumbledore, indicating the stone basin, ‘I use the pensieve. One simply siphons the excess thoughts from one’s mind, pours them into the basin and examines them at one’s own leisure. It becomes easier to spot patterns and links, you understand, when they are in this form’.

Rowling, 2000, pp. 518–519

THE INTRODUCTION OF REFLECTION TO LEARNERS

The definitions above facilitate consideration about the process of reflection, but simply giving learners the definition and telling them to get on with a reflective task proves not to be enough. Some learners will go away and get on with reflecting with no difficulty. They may have always have written a personal journal. Others learners will ask ‘But what do you want me to do?’ and, quite reasonably, they might then request a demonstration of what they should do. This is where we might recognise a common situation also among their teaching staff. It is likely to be a teacher who reflects easily who will have championed the use of reflective activities—but colleagues involved also may understand reflection no more than their students. There is no real reason why most teaching staff should know about reflection any more than the learners with whom they work.

There are a number of responses to the difficulties described above that go beyond the provision

of definitions of reflection. For example, Kolb,⁸ Gibbs,⁹ Johns,¹⁰ Moon³—resources^{1,7} provide structures that generally guide the processes of reflecting. Such structures can be helpful to students in the beginning of reflective work, but they should be seen as props to be dispensed with as soon as possible. Generally, these structures provide no guide to the achievement of better quality reflection, and sometimes they might be said to encourage a relatively superficial form of reflection. A frequent report is that it is difficult to get learners in a formal context to reflect at other than superficial and descriptive levels.^{11,12} The learning that results from superficial reflection is also likely to be superficial.

The idea that there is a depth dimension to reflection is not new,^{13,14} but has not generally impinged on the educational uses of reflection. The practical application of the concept of depth in reflection would seem to be important as a means to improving the quality of reflection. Probably, the best-known work on the specification of the levels of reflection up to now is that of Hatton and Smith.¹⁵ Others who have worked in this area are Van Manen,¹⁴ Mezirow,¹⁶ Wedman and Martin,¹⁷ Ross,¹⁸ Hettich,¹³ Sparkes-Langer et al.,¹⁹ Sparkes-Langer and Colton,²⁰ Kember et al.²¹ and Kember, Leung and associates.²² Generally speaking, the conceptions that underlie the frameworks provided by those listed above are similar (see later). Most of the frameworks are designed largely as assessment tools, and it is in a 'back to front' manner that they can be used to help learners to deepen their reflection. Also, the frameworks do not directly provide sample material.

It was to address the difficulty both of helping learners to start with reflection and then—at a later stage—to deepen their reflection that the first of the series of exercises which is illustrated below (Appendix 1) was developed. The exercises demonstrate the general concept of reflection and also its 'depth dimension'. They are based on broad reading of the literature on reflection, and in particular the work of those cited above. The exercises consist of a brief scenario written initially descriptively and then at two or three deeper levels of reflection. The first

exercise was developed in order to illustrate reflective writing to a group of higher education staff who wanted to apply for membership of the Institute for Learning and Teaching in Higher Education ('The Park', Moon).²³ A similar exercise was developed for use with students on a work experience module, who are required to reflect on their experiences of work placements ('The Presentation', Moon).²⁴ For these two earlier exercises, a commentary was provided at the end of the exercise, which describes the reflective processes illustrated at each level, and how these processes develop through the different levels in the context of the scenario. At this stage, on the basis of the experience of running these exercises on multiple occasions with staff and student groups and with further perusal of the literature, a generic framework for reflective writing was developed. The framework incorporated descriptions of four levels of reflection. The levels are descriptive writing, descriptive writing with some reflection, reflective writing (1) and reflective writing (2) (Appendix 2). Like the exercises, the framework has been further modified as it has been used. The levels in the framework are not intended directly to match the levels in the exercises—but are seen as markers on a continuum against which the exercises can be matched. Reflection is not a precise art.

It is important to be conscious of the purpose for using an exercise on reflection of this type. The purpose can be two-fold—both to introduce the practice of reflective writing and to show that there are different levels. It may be that it is not initially appropriate to use the deeper levels of some of the exercises to start with (e.g., the fourth part of 'The Park'), but to run the exercise in two stages focusing in different ways. Thought should also be given to the relative depth of reflection that matches the needs of any group of learners. For application to join a professional body, for example, very deep reflection is probably not appropriate.

Three more exercises have since been developed, 'The Dance Lesson' was designed for PGCE students with a sports specialism³ and 'GP's story' was designed for medical or nurse education. 'The Worrying Tutorial', which relates to an academic situation, is in Appendix 1

below. The same instructions work for any of the exercises (see below), and some of the exercises have three levels and some four. All now relate to the framework for reflective writing. While exercises have been developed specifically for particular groups of learners (and their teachers), the content of the scenario is not important, as the focus should be on the changing qualities of reflection. In fact, some groups can become too 'caught-up' in the content of the 'story' and lose their focus on the reflection. There is therefore an argument for deliberately avoiding the use of exercises with content that is relevant to that group of learners.

These exercises have been used in many staff development workshops across the UK and New Zealand, and there has been plenty of evidence that the staff have subsequently used them with their students. Generally, the exercises seem to be enjoyable, and they generate useful conversations about the nature of reflection and reflective writing. They can be used with large numbers and have been employed in such 'unfriendly' environments as full-tiered lecture theatres.

The exercises demonstrate how we can usefully use story as an aid to teaching and learning in higher education.²⁵

APPENDIX 1: THE WORRYING TUTORIAL

Instructions

The procedure for the exercise is described as a group process, though it can be used individually. The process works best with the presence of a facilitator, who is not engaged in the exercise. It takes around three quarters of an hour. Learners are given copies of the exercise (Appendix 1) and the reflective framework (Appendix 2), but they should be told not to leaf through the pages other than as instructed. The exercise works better when people follow the instructions—in particular, not beginning the discussions (see below) until everyone has read the relevant account. The facilitator should control this. The groups can be told that there are several accounts of an incident, and that

they will be reading them one after the other, with time after each session of reading for discussion about the reflective content of the account.

- The exercise is introduced as means to demonstrate reflection and/or depths/levels of reflection, and deeper reflection probably equates with better learning.
- Small groups are formed (no more than six in each).
- The groups are told to turn to the first account and read it quietly to themselves, considering which features they think are reflective.
- When it is evident that most people have read the first account, the groups are invited to discuss the account and identify where and how it is reflective. They are given about 7 min for each discussion session, though they may need less time for the earlier accounts.
- After the discussion session, the participants are asked to read the next account in the sequence (and they are reminded not to turn pages beyond the account in hand).
- After the last account has been read and discussed, groups are asked to go back through all of the accounts and to identify features of the reflection that progressively change through the accounts. For example, the accounts change from being 'story' to focusing on issues in the incident. In the deepest account, there is more recognition that there are multiple perspectives in viewing the issue, etc. Sometimes there are changes between two of the levels, but not throughout all of them. The groups are asked to list (e.g., on flip chart paper) the ways in which the accounts 'deepen'.
- In a plenary, the groups share their lists (as above) and discuss the whole exercise. It is at this stage that the participants can be referred to the Framework for Reflective Writing, which provides a general guide to features in deepening reflection. The accounts are not intended to accord directly with the stages described.

If the exercise is used with staff, and if they are likely to want to use it later with their own students, it is worth having spare copies available

as participants tend to want to mark/underline text on their copies as they do the exercise.

THE WORRYING TUTORIAL

Material written by Jenny Moon, Bournemouth University It may be freely copied for use with learners.

Ian is 28. He is in the middle of the final year of a degree in biological sciences. He has worked in an agricultural laboratory before his degree programme, and has embarked on the programme in order to take a post in agricultural research. Like many mature students, he has responsibilities at home that prove to be distractions to his degree work. He has just seen Pam, his tutor, for feedback on a recently marked essay.

Account 1

I am gutted. I saw Pam this morning. She wanted to talk about my ecology essay. She was blunt. She said that I have not had any 'good' marks for work that I have done for the past year and a half—but none have been as near to failure as this one. She called this a 'hairs breadth pass', and she laid it on the line that I need to put in more effort all round or I will not be getting the degree that I need to work on research at Cummings. If I do not get that job, I could well end up with the same job that I did before and all this money and effort will have been pointless.

It seems that my essay was too descriptive and Pam tried to tell me what she meant by that. The title asked me to discuss the concepts of tolerance and limiting factors in relation to two named wild populations. I used Jencks and Parner's study of *Abinicus alba* and Cristom's study of *Chyrups dipimus*. We covered the latter in a lecture and were given the reference for the other, so I thought they were all right. Pam said that I should have found my own examples. She says that that I write too factually. I need to make it clear that I realise that theories are not the same as facts. I need to think about how I use references. At this level

I should question the data that I am working with—I should analyse and criticise it—not just accept it. She says that I am good at assembling facts, but that is not good enough now. Pam said that I should ask Tim if I can see some of his recent essays in order to get the idea and maybe I should go and see the study counsellor. I used to be good at essays. It seems that suddenly I am not.

I did really well in the first year of the degree. I felt that I knew most of the material that we covered—I had learnt it in my day-to-day work, though sometimes I had to re-interpret it for the this academic context. Essays used just to flow out and I got good marks. I did do some reading and I would add a few references. I am not clear where those abilities have gone to. Suddenly I am not good any more. I suppose that some of it is to do with the baby. Pam and I did talk about how hard it is for me to study since Angie had the baby last year. Angie was ill over the pregnancy and after the birth. I was up in the nights and so tired and now I cannot concentrate at home, because the baby is on her feet and all over everything. When I was trying to write the ecology essay she was teething and was not sleeping in the evenings. It is really hard being a student at this time in my life. The younger ones just do not know how easy they have got it.

I feel so gutted that I really do not know how I can go home at present. Angie still thinks that I am top of the class. I could not tell her. She has such faith in me—and I must get the new job in order to justify the hassle and expense of going back into education.

Account 2

Pam, my tutor, has talked with me about the essay I did for ecology and my progress in general. I have to face up to the fact that the mark was poor. If I do not do better, I will not get the research job at Cummings—and will be going back to the same job that I did before the degree and getting the new job was the whole point of doing the degree. I have felt so bad about this session with Pam and what it implies for me that I have not wanted to go

home this evening. I know it is because I do not want to tell Angie that I am not as good at study as she thinks I am. She has such faith in me and I know that I am resistant to shaking that faith. However, I can see that I need to make some changes at home and, until I talk to Angie, those changes will not make sense to her. What do I do or say?

Pam knows the difficulties that I had at home in the past year—in particular, the distractions that occurred with the pregnancy, birth and with Angie's health. I suppose that my work began to deteriorate from around that time. I knew it was happening. Pam reminded me of several occasions when she told me that I should be doing some reading around the lectures, but I somehow thought that I would get through and did not bother too much. I thought that a few poorer marks would not be a problem because I had done so well before and that really I did know how to write good essays.

Maybe I need to think about what Pam said about my essay. She says it is too descriptive and not analytical and discursive. She says that I am good at 'assembling facts', but that is not good enough for now and I should use my own examples—not those given in lectures. I need to think about what she means by that. I suppose that it means that I can write well but that is not well enough now and I need to be more original. What does she mean by analyse and discuss? She also says I need to distinguish between theory and fact. I suppose that there is a difference that I need to consider and which may have something to do with the ways I use referencing that she also mentioned. It seems that I need to change the way in which I see the task of writing essays. I will ask Tim how he writes such good essays. Pam says that Tim's essays are a good example. She also mentioned the study skills person, some books and coming back to her when I have thought about it.

So here I am, in the middle of my last year and in danger of not doing well enough to achieve what I must achieve for the future welfare of my family. What once seemed simple does not seem simple any more, and it is all contorted by how well I did in the first year,

and the frustrations (and joys, of course) of having a new baby. There is something about the image that Angie has of me as the great success story. Have I got to change that? All these things are floating around in there. I hope that they sort themselves out.

Account 3

I want to think about the tutorial I had with Pam. It was about my ecology essay and the very low marks for it. It was a seriously low mark. Pam also talked more generally about my lack of achievement. I noted down what she said about it, but it hurts to acknowledge it. Basically, Pam says that the essay and my current prospects are both poor, and she points out the increasing likelihood that I will not get a sufficiently good degree to get the research job at Cummings. It is the purpose of getting that job that brought me to university with all the sacrifices that has meant. When I look at the notes I wrote, my anxiety levels shoot up and I know I have to act. On previous occasions (not as heavy as this) I have just thought about it a bit, and then I suppose I have gone back to the old assumptions that I would be all right because I am really a good student.

Where did those assumptions come from? I was well ahead in the first year and I had no problem in putting down material that was acceptable in essays. That might link up with what Pam said today about me being good at 'assembling facts'. Maybe that is what was wanted in the first year of the course and maybe she is really saying that doing that is not acceptable now. I am not totally clear from what Pam said what is wanted now—but it seems that most of my classmates do know. I will list the things that Pam said about my essay and work on them until I really understand what I need to do to write a good essay. Pam talked about things I could do. I must do them.

Now I start to think, things begin to link up. Pam and I talked about how disruptive past year was for my studies—with Angie being pregnant and ill, and with Meg's birth. Then, Pam was very sympathetic and even today I got into the 'poor me, how hard it is to be an adult student'

stuff again. But then I am thinking that that attitude will not get me the degree and the job I want, and I need to see it now as a convenient excuse. I did well in the first year because I knew the stuff, and then rested on my success when everything went haywire. I assumed that I could just re-engage—but I did not realise that the game had changed. What is asked for now is something different—not just the assembly of facts any more.

That brings me to why I am still in the library this evening and it is late and I have not gone home. I do not want to go home and tell Angie that I am not doing as well as she thinks. She assumes that I am still doing brilliantly—though past year she did question how I could be doing so well on so little work. I need a big shift in thinking—fast—and Angie is where I start. I need to tell her honestly about the tutorial, the feedback and my disappointment in myself. I am not the success that both of us assumed. I need her support so that I can get through this next 6 months and into the job, and Angie's turn will come.

I list what I need to do apart from talking with Angie: I need to do to find out how to write a good essay at this stage in my degree. I need to find out what it means to 'discuss' and analyse, and to sort out what a 'theory' is in ecology. I realise that I have never quite understood why we have theories about some things and we simply 'know' about other things. It seems that there is something different in ecology from the stuff that seemed 'factual' in the basic biology stuff. I need to think about these things and form them into clear questions so that I can find out what I need to know and how to put it on paper in an acceptable way. I think that the referencing will fall into place if I get these things sorted. Asking Tim may help only if I am clear about what I need to know. I will go back to Pam when I done the thinking as well. Pam mentioned a couple of books and a website and the study skills person (make appointment tomorrow). There was also that research student I talked to in the bar the other night. I think I could talk more with him—but I need to be focussed about the information that I need.

APPENDIX 2.

A FRAMEWORK FOR REFLECTIVE WRITING

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Descriptive writing

This account is descriptive and it contains little reflection. It may tell a story, but from one point of view at a time, and generally one point at a time is made. Ideas tend to be linked by the sequence of the account/story rather than by meaning. The account describes what happened, sometimes mentioning past experiences, sometimes anticipating the future—but all in the context of an account of the event.

There may be references to emotional reactions, but they are not explored and not related to behaviour.

The account may relate to ideas or external information, but these are not considered or questioned, and the possible impact on behaviour or the meaning of events is not mentioned.

There is little attempt to focus on particular issues. Most points are made with similar weight.

The writing could hardly be deemed to be reflective at all. It could be a reasonably written account of an event that would serve as a basis on which reflection might start, though a good description that precedes reflective accounts will tend to be more focused and to signal points and issues for further reflection.

Descriptive account with some reflection

This is a descriptive account that signals points for reflection while not actually showing much reflection.

The basic account is descriptive in the manner of description above. There is little addition of ideas from outside the event, reference to alternative viewpoints or attitudes to others, comment and so on. However, the account is

more than just a story. It is focused on the event as if there is a big question or there are questions to be asked and answered. Points on which reflection could occur are signalled.

There is recognition of the worth of further exploring, but it does not go very far. In other words, asking the questions makes it more than a descriptive account, but the lack of attempt to respond to the questions means that there is little actual analysis of the events.

The questioning does begin to suggest a 'standing back from the event' in (usually) isolated areas of the account.

There is a sense of recognition this is an incident from which learning can be gained—but the reflection does not go sufficiently deep to enable the learning to begin to occur.

Reflective writing (1)

There is description but it is focused with particular aspects accentuated for reflective comment. There may be a sense that the material is being mulled around. It is no longer a straightforward account of an event, but it is definitely reflective.

There is evidence of external ideas or information and where this occurs, the material is subjected to reflection.

The account shows some analysis, and there is recognition of the worth of exploring motives or reasons for behaviour.

Where relevant, there is willingness to be critical of the action of self or others. There is likely to be some self-questioning and willingness also to recognise the overall effect of the event on self. In other words, there is some 'standing back' from the event.

There may be recognition that things might look different from other perspectives, and that views can change with time or the emotional state. The existence of several alternative points of view may be acknowledged, but not analysed.

In other words, in a relatively limited way the account may recognise that frames of reference affect the manner in which we reflect at a given time, but it does not deal with this in a way that links it effectively to issues about the quality of personal judgement.

Reflective writing (2)

Description now only serves the process of reflection, covering the issues for reflection and noting their context. There is clear evidence of standing back from an event, and there is mulling over and internal dialogue.

The account shows deep reflection, and it incorporates a recognition that the frame of reference with which an event is viewed can change.

A metacognitive stance is taken (i.e., critical awareness of one's own processes of mental functioning—including reflection).

The account probably recognises that events exist in a historical or social context, which may be influential on a person's reaction to them. In other words, multiple perspectives are noted.

Self-questioning is evident (an 'internal dialogue' is set up at times), deliberating between different views of personal behaviour and that of others).

The view and motives of others are taken into account and considered against those of the writer.

There is recognition that prior experience, thoughts (own and other's) interact with the production of current behaviour.

There is observation that there is learning to be gained from the experience, and points for learning are noted.

There is recognition that the personal frame of reference can change according to the emotional state in which it is written, the acquisition

of new information, the review of ideas and the effect of time passing.

The effective of these variables on personal judgement is taken into account in making judgements.

Similar exercises are to be found in Moon.^{3,26}

NOTE ADDED IN PROOF

Exercises such as ‘the worried student’ are also available as a free download at <http://www.cemp.ac.uk/research/learningjournals>, <http://www.cemp.ac.uk/research/reflectivelearning> and similar examples on critical thinking at <http://www.cemp.ac.uk/research/criticalthinking>.

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