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The use of reflection in medical education: AMEE Guide No. 44

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Abstract

Reflection is a metacognitive process that creates a greater understanding of both the self and the situation so that future actions can be informed by this understanding. Self-regulated and lifelong learning have reflection as an essential aspect, and it is also required to develop both a therapeutic relationship and professional expertise. There are a variety of educational approaches in undergraduate, postgraduate and continuing medical education that can be used to facilitate reflection, from text based reflective journals and critical incident reports to the creative use of digital media and storytelling. The choice of approach varies with the intended outcomes, but it should also be determined by the user since everyone has a preferred style. Guided reflection, with supportive challenge from a mentor or facilitator, is important so that underlying assumptions can be challenged and new perspectives considered. Feedback also has an important role to enhance reflection. There is little research evidence to suggest that reflection improves quality of care but the process of care can be enhanced.

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Introduction

There is increasing emphasis on the use of reflection in both undergraduate, postgraduate and continuing medical education, but often the nature and intentions of reflection are nebulous. An understanding of the educational benefits of reflection requires an appreciation of both its theoretical and practical aspects.

The word 'reflection' is widely used in a variety of different contexts, from physics to education, but all remain true to its Latin origins: 'to bend' or 'to turn back'. Reflection in the education context can be considered as a process in which thoughts are 'turned back' so that they can be interpreted or analysed. The trigger to this sense-making process is usually an event or situation and the outcome of the process is increased understanding or awareness. These insights can then be used in the future when faced with a similar event or situation. There are several definitions of 'reflection' that include these essential dimensions (Box 1).

Without reflection, it would be unlikely that the human race would have survived. A simple example is our caveman ancestors who quickly became aware that sabre-tooth tigers can bite and must be avoided in the future! The process of reflection can be summarised as a simple three-stage model that involves three components: planning, doing and review (Figure 1).

The concept of 'reflection' is widely mentioned in medical education literature but often different terms are used to describe similar processes. Reflection is an essential component of reflective learning and reflective practice. Reflective learning has the intention of improving learning and when this happens in the context of working with the ill-defined problems of professional practice it is often called reflective practice. The intended 'learning' is also often not clearly defined.

Practice points

- Reflection is a metacognitive process that creates greater understanding of self and situations to inform future action.
- Reflection has a variety of intended outcomes. Self-regulated and lifelong learning have reflection as an essential aspect, and it is also required to develop both a therapeutic relationship and professional expertise.
- There are a variety of educational approaches in undergraduate, postgraduate and continuing medical education that can be used to facilitate reflection but these should be determined by the user.
- Guided reflection and feedback are important for effective reflection.
- Although there is no evidence to suggest that reflection actually does improve patient care it seems logical and likely since the process of care can be influenced.

A wider definition of reflection is proposed for use in this Guide so that it includes a spectrum of possible uses, approaches and intended outcomes:

> *Reflection is a metacognitive process that occurs before, during and after situations with the purpose of developing greater understanding of both the self and the situation so that future encounters with the situation are informed from previous encounters.*

This definition has several important aspects:

- A metacognitive process suggests that metacognition, or *'thinking about thinking'*, is essential for effective

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Box 1. Some definitions of reflection.

Reflection (Dewey 1938):

'*an 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 conclusion to which it tends*'.

Reflection (Boud et al. 1985):

'*a generic term for those intellectual and affective activities in which individuals engage to explore their experiences in order to lead to a new understanding and appreciation*'.

Reflection (Moon 2004):

'*a form of mental processing with a purpose and/or anticipated outcome that is applied to relatively complex or unstructured ideas for which there is no obvious solution*'.



Figure 1. The basic three stage model of reflection.

reflection. Metacognition is a self-regulatory process that selects, monitors and evaluates a cognitive process (Flavell 1979). In this case, the cognitive process is the approach to reflection. This concept is important since it highlights that reflection is a process that can be controlled and it also allows various training strategies to be developed so that reflection can be enhanced.

- Reflection can occur at all stages of an encounter: before, during and after. Often reflection is only performed after an event or situation but reflection before an action has the advantage of approaching situations with a particular learning goal or perception that can be challenged. This has the potential for greater personal growth and learning.
- Understanding of both the self and the situation has a wider impact on lifelong learning than simply identifying the acquisition of new knowledge and skills, such as how to perform a particular clinical procedure. An essential component of medical professional practice is the 'therapeutic self', that recognises the underlying personal values and beliefs that are represented as professional attitudes, such as empathy and caring. Understanding the 'self' is also required to develop the important self-efficacy component that is required to become a self-regulated lifelong learner.
- Informing future action suggests that reflection is a process with a definite purpose. Making sense of a situation will not improve practice unless these insights can change future responses to situations.

Importance of the topic in international medical education

The concept of reflection has become enshrined within the plethora of various national and international statements of the desired outcomes for medical undergraduate, postgraduate and continuing medical education. Most definitions of what it means to be a professional also include statements about reflection or lifelong learning. However, these statements usually provide little discussion of the approaches to be used and the intended outcomes.

Aim/objectives of the guide

The aim of this Guide on 'Reflection', in medical education is to provide an overview of the concept and also to provide practical advice for the effective implementation and assessment of reflection in undergraduate, postgraduate and continuing medical education.

The main approaches to reflection in medical education

The use of reflection in medical education has developed through several paths that have been informed by different educational intentions and expected outcomes. There is a large overlap but three main approaches can be considered:

Reflection for learning

Experiential learning is a process by which learning occurs by having an experience. However, experience alone is not sufficient for learning to occur. The experience must be interpreted and integrated into existing knowledge structures to become new or expanded knowledge. Reflection is crucial for this active process of learning. The concept of experiential can be easily understood by considering how we all learn from the vast range of different events and situations that we all experience in our daily personal and professional lives. For example, we can learn about the side-effects of a drug by observing the reactions of a patient who is prescribed a drug or we can develop a clinical skill by ineffectively using this skill.

The widely quoted 'experiential learning cycle' approach has four main phases (Figure 2) (Kolb 1984). In the first phase, the learner has an experience. A second phase of reflection follows and this leads to a third phase of 'abstract conceptualisation'. This is a time when the learner makes attempts to understand their actions or reactions to the experience. There is often an emphasis on the identification of any learning needs, such as new information that has to be obtained or new skills that need to be acquired before facing a similar situation in the future. Application of the new knowledge and skills occurs in the fourth phase. This can be a cyclical process and be repeated several times, with increased learning obtained through each cycle.

The Kolb experiential learning cycle can be applied to a wide range of learning situations in undergraduate, postgraduate and continuing medical education.

Reflection to develop a therapeutic relationship

Being a 'good' clinician requires having appropriate knowledge and skills but there is also a need to establish and maintain a therapeutic relationship with patients and their carers (Freshwater 2002). This concept implies that a

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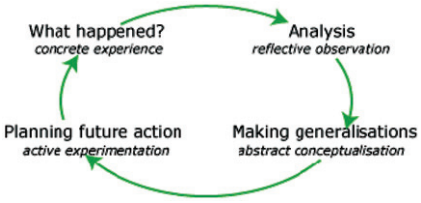

Figure 2. The experiential learning cycle (after Kolb).

relationship has a beneficial effect on patient wellbeing. The importance of a therapeutic relationship has long been recognised in psychotherapy but recent interest in patient-centred care has highlighted that there are improved outcomes, including patient satisfaction, improved chronic disease care and concordance (Stewart et al. 2000).

An essential aspect of the therapeutic relationship is the recognition and understanding of the personal belief and value systems of the involved individuals, whether clinician or patient. There may be differences between these systems and this can produce a strong emotional reaction in the clinician, which in turn can influence their decision making and subsequent actions. Recent neurocognitive research suggests effective reasoning is a mainly subconscious process in which there is modulation of logical information processing by emotions. For example, anger towards the patient may result in a response that would be different if the individual was empathic.

Building a therapeutic relationship is an essential component of professional practice and is a key attribute of being a professional. Guided reflection with a supervisor or mentor is particularly useful for this approach to reflection since underlying beliefs and assumptions can be identified and challenged.

Reflection to develop a therapeutic relationship is particularly important for postgraduate and continuing medical education but is also applicable to undergraduate education, especially in the clinical years.

Reflection to develop professional practice

Clinicians often have to respond to a wide variety of situations that are complex and poorly defined. This 'messiness' of professional practice is at the heart of professional expertise (Schon 1983). Expert professionals appear to quickly make decisions that are appropriate to these complex circumstances and an explanation is that through a process of reflection-on-action, they are able to build up a collection of mental models that can be quickly mobilised to effectively address the situation through reflection-in-action.

The development of professional expertise requires more than a collection of knowledge and skills (Eraut 1994). Expert performance is a complex integration of knowledge and skills that are appropriate to the unique situation that they face. Repeated exposure to the complexities of professional life is essential and guided reflection can maximise the learning opportunity for this approach to reflection.

Reflection to develop professional practice is essential for postgraduate and continuing medical education.

Although the three approaches have different intended outcome, they all share an essential aspect. A deliberate process used to develop an understanding, or making sense, of a situation so that future actions can be informed. This is the essence of reflection.

Self-regulated learning and reflection

There has been increasing interest in the concept of self-regulated learning. An essential attribute of every healthcare professional is that they will become masters of their own lifelong learning. Self-regulated learners use metacognitive processes to select, monitor and evaluate their approach to a task (Zimmerman & Schunk 2001). Research into self-regulated learners in academic contexts highlights that a deeper approach to learning occurs and this is associated with improved academic performance. The same self-regulated approach has also been noted across a wider range of contexts with improved psychological well being and personal effectiveness (Baumeister & Vohs 2004).

Reflection can be considered as a self-regulated learning activity. An appreciation of this relationship offers useful insights into how reflection can be developed and made widely applicable to the variety of experiences that make up everyone's daily personal and professional lives.

The process of developing an understanding

Everyone tries to make sense and understand their experiences. This is achieved through the creation of a mental model or personal theory. These models or theories are actively created and are informed by previous encounters with similar situations. For example, an individual will have certain beliefs that a particular skill or piece of information will be helpful to them in dealing with a problem. There may also be certain beliefs that these individuals have about themselves or about others. These beliefs and assumptions are challenged whenever a situation is subsequently encountered. The outcome of this process is that the beliefs and assumptions may need to be revised as a result of the experience. Sometimes this process can be quite dramatic and this results in a major shift in perspective. In such circumstances, 'transformative learning' is said to have occurred (Mezirow 1981). The most powerful learning, or shift in perspective, occurs when fundamental beliefs are challenged, such as those related to a view of the self or the world. This shift is usually accompanied by strong feelings and an emotional reaction, such as sadness, shame or anger.

An essential step before the process of developing understanding is 'noticing'. Mezirow (1981) describes the 'disorientating dilemma' when the individual begins to realise that there is a discrepancy between their current actions (based on existing mental models or personal theories) and the actions required for effective resolution of the situation that they face. This may be immediately obvious to the individual but may require the use of prompts, such as feedback from others or

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a critical incident review. Noticing can occur at any stage of reflection, that is, before, during or after a situation. The importance of an appreciation that reflection is a metacognitive process is that an individual has to be aware of the need to reflect and this requires the ability to notice the 'disorientating dilemma' or prompt to reflect. Often this will be emotional, with a feeling of discomfort or apprehension associated with a situation. This awareness can be developed though 'mindful practice' in which there is heightened moment-to-moment awareness during situations (Epstein 1999).

Another essential step is the application of the new understanding to further situations (Johns & Freshwater 1998). Reflection is an ongoing process and its value depends on repeated cycles of action, reflection and action. During each action, especially if they are similar, there are opportunities to increase the depth of understanding. This approach is similar to action research and practitioner research which has been extensively used for teacher continuing professional development, but rarely used in the continuing medical education context.

The depth of understanding can also be increased by adopting a critical reflective stance and the application of double loop and triple loop learning. Argyris and Schön (1994) first introduced the concept of single loop and double loop learning. The first loop of learning occurs when an outcome unexpectedly occurs and the individual looks for another strategy to deal with it. Double loop learning occurs when there is a more questioning approach that seeks to identify the reasons behind why the outcome unexpectedly happened in the first place. For example, a clinician may be uncertain about the most effective treatment for a common condition. Single loop learning would identify a learning need and the obvious response would be to seek information about effective treatment, such as looking it up in a textbook or asking a colleague. The specific learning need has been met but consideration of double loop learning would reveal the underlying reason for the clinician being uncertain about the treatment. This may be because there is an over dependence on opportunistic learning rather than systematically identifying their learning needs. The consequences of the clinician's approach to learning are far beyond the initial superficial learning need. Consideration of further triple loop learning is related to the critical aspects of the situation (Carr & Kemmis 1986). This concerns the underlying system of power and control that influences all actions. The specific question to be asked is *'Why should we do it that way?'* There is the possibility of conflict over what is considered to be 'the right' way of doing things but it is only by discussing the underlying purposes and intentions of actions that the present approaches can be challenged and the possibility of new approaches considered. This type of learning can be highly transformative and has the potential to change both individuals and the wider society.

Guided reflection

The potential of reflection for individuals may not be fully realised without the help and support of another person. This 'other' person may be a peer group member or someone with a specific role, such as a supervisor or mentor (Hawkins & Shohet 1989). The role of this person is to facilitate reflection and for this to be effective it requires a skilful mix of support and challenge.

At the heart of reflection is the challenge, and subsequent change, in perspective that can inform future action. The most significant experiences that result in the greatest challenge and change are usually those that are associated with the presence of strong emotions. There are several consequences of these types of experiences. First, an individual may consciously, or more likely unconsciously, block the noticing of this important experience. Second, there is often a reluctance to discuss the experience and to consider change. A facilitator can provide the necessary supportive environment to enable the individual to notice and make sense of their experience. The facilitator can provide this support through key counselling and mentoring skills, such as non-judgmental questioning and acceptance of differences. Attention to the physical environment is also important, ensuring that the discussion can occur in privacy and is free from interruption. More detailed description and discussion of facilitation is provided in Further Reading.

Guided reflection is particularly useful for reflection that has the intention of improving the therapeutic relationship and professional practice. Supervision has long been recognised as essential for psychotherapy and counselling. The descriptions of reflective learning by Schön (1987) also highlight the role of a mentor.

Students appear to appreciate the help of a supervisor or mentor to facilitate their reflection. This was a consistent theme throughout all of the studies identified in a limited literature review for this Guide. There are significant workload implications for the introduction of guided reflection in any curriculum but effective alternatives include group supervision (with one supervisor and a group of learners) or peer co-supervision (with students mutually facilitating one another in a reciprocal manner so that each takes a turn as a presenter and a facilitator). Peer supervision also has the advantage of individual development of skills that can be more widely used, such as in clinical encounters.

Ethical aspects of reflection

Making sense of an experience can be associated with strong emotions (Boud et al. 1985). This may be obvious when an individual reflects on their contribution to an adverse event, such as the death of a patient, but there can also be profound emotions associated when considering a simple information need, such as when a particular fact cannot be recalled. Previous experiences, and the associated feelings, may be vividly remembered, such as when previously ridiculed as a student for not remembering a fact. It is essential to create a safe overall environment within which personal reflection can take place. This is particularly important if reflection is to be in a group setting or with a facilitator but is also important for all reflection, including written reflective journals (Henderson et al. 2003).

It is often assumed that increased self-awareness through reflection will be useful to individuals but there is the

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possibility that some individuals can increase their self-rumination behaviour where they are not able to shut off thoughts about themselves. This is an anxious attention to self and they may constantly question their motives and become unsure about their actions.

Important ethical considerations about confidentiality include who has access to the reflection and for what purpose. Many educational programmes and professional revalidation schemes insist on individuals keeping a reflective diary and often the entries are used for assessment. There is a tension in these circumstances since assessment usually requires evidence of 'deep' reflection but it is this type of significant experience that exposes the vulnerability of the individual. This is particularly important when the assessor is also the facilitator or mentor.

There are no easy answers to these problems but the issues require careful consideration. It has to be expected that some individuals may require emotional and psychological support beyond the initial reaction. It is good practice to provide support service contact numbers to individuals and for facilitators to be aware of the available support services.

The educational impact of reflection in medical education

A recent systematic review of reflection and reflective practice in health care professional education and practice highlighted that, to date, there was no convincing evidence that reflection enhanced competence through a change in clinical practice or improved patient care (Mann et al. 2007). However, the authors noted that there was a plausible potential benefit. There was evidence that reflection was associated with a deeper approach to learning that allowed new learning to be integrated with existing knowledge and skills. An important outcome that they identified was that diagnostic reasoning of complex and unusual cases could be improved by reflection.

A limited literature review of reflection in undergraduate medical education was performed for this Guide and 21 articles were identified that were relevant to the purpose of the review. A variety of methods to foster reflection were identified but only one study compared different approaches (Baernstein & Fryer-Edwards 2003). This study had the aim of identifying whether writing a critical incident report, a one-to-one interview, or a combination, was more effective in eliciting reflection. The conclusion was that an interview with a tutor was the most effective for reflection on professionalism. There have been no longitudinal studies during the medical school experience and there is no evidence of the benefits of reflection on their long-term development, especially in their subsequent clinical care. Reflection by undergraduate medical students increased self-reported measures of self-awareness, professional thinking skills and the skills required for intimate examinations. Four studies described positive objective outcomes, with increased skills in reflection and diagnostic thinking (Sobral 2000), professional identity (Niemi 1997), scores in medical-humanism aptitude (Wiecha et al. 2002) and final examination results for obstetrics and gynaecology (Lonka et al. 2001). In conclusion, students found reflection was useful and the implementation of reflection increased both self-reported and objective outcomes on learning and professional development.

How to implement reflection in medical education

There are a wide variety of different approaches to implement reflection in medical education and these will depend on the intended outcome but also on the constraints of the environment within which reflection takes place, such as the requirements of an academic course.

Educational strategies to develop reflection

The self-regulated learning model (Zimmerman & Schunk 2001) provides a useful framework to guide educational strategies that can be used to develop reflection. This model also helps educators to understand the potential barriers and how they can be overcome.

a) Motivation for reflection

Successful reflection requires the individual to recognise the importance of reflection for both personal growth and professional development. Motivation is dependent on setting clear goals, internal factors and external factors. Goal setting may be difficult if the intended outcome of reflection is not explicit. Often the learner is instructed 'to reflect' but with little or no explanation of the purpose. It is helpful to initially provide information about the nature and outcomes of reflection, including its importance for professional practice and lifelong learning.

The main internal motivation factors are self-efficacy and the perceived ease of the task. These factors are essential to consider, especially when reflection is initially introduced to learners. Motivation can be increased by encouragement and by gradually increasing the reflective tasks, such as beginning with only noticing and then introducing the complete reflective process.

The overall external educational environment within which reflection is expected to occur is an important motivation factor. Assessment appears to drive learning, from examinations in undergraduate students to certification and revalidation in postgraduates and continuing medical education. The use of an assessed portfolio for personal and professional reflective learning will be different to an informal journal or diary.

b) Metacognitive skills for reflection

It is essential that an individual can develop their metacognitive skills to monitor and evaluate the key aspects of reflection: noticing, processing and altered action.

Noticing

An essential first step for an individual is the recognition of when their existing mental models and personal theories are

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being challenged by the experience of a particular event or situation. This can occur at any time related to an event or situation: before, during or after. Without an initial awareness no reflection can occur. Noticing can be developed by using several techniques.

(i) Self monitoring. Increased awareness can be developed by constant self-monitoring of thoughts and emotions. Most individuals do not find this easy to achieve but it can be developed by participating in mindful practice (Epstein 1999). Mindfulness has its roots in Eastern philosophical-religious traditions in which emotion, memory and action are inter-dependent. In mindful practice, the individual is not only aware of the moment to moment changes in thoughts and emotions that they experience but also they are able to make sense of these components and to make use of these insights to inform their actions.

Becoming mindful requires deliberate and non-judgemental attention to the immediate thoughts and emotions that an individual experiences. This can be developed by regular self-recording, such as by the use of written or audio diaries and logs. Small paper notepads are useful but with the advent of mobile devices it is possible to easily record verbal comments by using digital dictaphones or the voice recording function that is present on many mobile phones or iPods. It is particularly helpful to make a record at the time of the event happening, a so called 'thought catching' approach, but often this may not be possible. In these circumstances, the record should be made as soon as possible after the event. Immediate recording of thoughts is likely to be a closer reflection of underlying beliefs since later mental organisation for recording is likely to include attributions that may, or not, be an accurate reflection. The consequence is hindsight bias and often this will reveal a more positive view of the self. Increased awareness can be triggered by a wide variety of events, from direct contact with patients and colleagues to watching films or reading literature (Hampshire & Avery 2001). This is the important role of humanities in medical education and exposure to a wide variety of experiences through the eyes of others is to be encouraged.

The self-monitoring techniques may feel artificial and contrived at the beginning but most individuals rapidly adapt so that it becomes a routine and subconscious process. This is typical of most cognitive instruction strategies.

(ii) Feedback from others. An individual's reaction to events may not be readily apparent to them but it can often be more apparent to others. Behaviour can be readily observed that represents underlying beliefs, such as a sarcastic comment, but non-verbal behaviour, such as the tone of voice or facial expression, is often a more powerful indicator of these beliefs and this can be readily observed by others. Feedback can be obtained from a variety of sources, including colleagues and patients. Feedback is usually provided anonymously but a disadvantage is that clarification of comments is not possible. A supervisor or mentor can also provide useful feedback.

Research has consistently shown that individuals self-rate themselves higher and in a more positive light than when rated by others (Gordon 1994). An effective, reflective learner or practitioner will actively seek out sources of feedback.

(iii) Critical incidents and significant event analysis. Most individuals have 'moments of surprise' when an action unexpectedly goes to plan or not. These moments provide a valuable opportunity for reflection, especially in postgraduate and continuing medical education. These can be personally noted, such as in a reflective diary or log, or as part of an organisational tool, such as significant or sentinel event audit. The approach has also been used in undergraduate medical education (Henderson et al. 2002).

Processing

The main value of reflection is to develop an understanding of both the self and the situation. It is only through this sense making process that future actions can be altered. There are several techniques and these depend on the intention of reflection.

(i) Reflection for learning. The main process with this intention is to identify learning needs, especially about information to be obtained or new skills that need to be developed. The learner can ask themselves a variety of simple questions, such as

- *Does anything surprise me about the situation?*
- *Do I have the information or skills to deal with this situation?*
- *Do I need to have further information or skills to deal with this situation, either now or in the future?*

This approach is typical of most personal and professional development plans. There is the possibility that the approach can become superficial and not address major underlying problems, such as why the doctor did not keep up to date about the latest antibiotics. Addressing this type of issue, which is often related to underlying beliefs, requires double loop learning in which further questioning is required. Typical further questions include

- *Is the lack of information or skill due to having insufficient information or skill on how to address this lack?*
  This question seeks to identify the learner's information seeking and personal development skills.
- *What is the underlying reason why the identified issue was not resolved?*
  This question seeks to identify beliefs about self, such as self-efficacy, and moves reflection to a deeper level.

(ii) Reflection to develop a therapeutic relationship. A therapeutic relationship is fundamental to medical professionalism and combines the communicative doctor-patient relationship with an active giving of self that is expressed through compassion and care. This aspect is at the heart of medical practice and is determined by the beliefs and values of the individual. It is also dependent on a deep appreciation of how the other person is thinking and feeling. The topic is closely aligned to emotional intelligence which has been associated with individual well being and satisfaction.

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Reflection with this intention seeks to identify and challenge current belief systems and assumptions. Often there is an awareness of strong feelings associated with a particular experience and this can lead to deeper questioning. These questions include

- *What am I feeling and what are my emotions?*
- *Why do I feel like this?*
- *Are there other situations in my life or my encounters with others when I feel the same?*
- *Can I explain why I feel this way?*
- *What are the consequences of these emotions for me and for others?*

(iii) Reflection to develop professional practice. The intention of this approach to reflection is to develop professional expertise. Research into the nature of expertise identifies that experts have more elaborate mental models than novices. This allows experts to quickly mobilise these models when they encounter a situation. The elaborate models are created by repeated exposure to a wide variety of experiences and they are also closely interconnected. Development of these models has not occurred by a random phenomenon but through repeated exposure to situations. This is the key to professional expertise.

Professional expertise can be developed by encouraging repeated exposure to the field of practice and by widening this field with further experiences from related films and literature. A process of constant reflection-on-action is an essential requirement for professional expertise and is typical of the 'enquiring mind' that explores and tries to obtain multiple perspectives to enrich their view of the world. Often there is little in the way of written reflection but there may be wide ranging discussions with colleagues, such as journal clubs and at conference. Some doctors try and make sense by the use of written reflection, either as reflective diaries, reflective story-telling or poems.

Future action

It can be easy to assume that reflection is only introspection with little outside application. However, the aim of reflection is to inform future actions so that they can be more purposive and deliberate. An important aspect is to ensure that actions respect the context to which they are being applied, such as when evidence based clinical guidelines are not followed because the patient is different to the population in which the original research was conducted. This often results in further cycles of reflection and action when the consequences of this decision making are considered.

c) Reflective storytelling and writing

There is a long and ancient history of storytelling in most civilisations. Individuals tell stories to convey their experiences to others and these stories include information, opinions and emotions. It is a natural step for storytelling to be used for reflective learning since an integral aspect of many stories is reflection on an experience with the development of new insights. The process of telling a story, whether written or oral, requires the teller to notice and make sense of an experience. The presentation of the story, either private or within a group appears to have an important therapeutic aspect which allows the learner to release emotion, an essential part of the reflective process (Gersie 1997).

Storytelling has been used to effectively engage students and healthcare professionals in reflection and reflective practice (McDrury & Alterio 2003). Individuals often require initial training to develop their storytelling skills and a structured approach is useful. A typical sequence for a story is a beginning, middle and an end. Usually the beginning sets the scene and this is followed by a middle component in which the 'drama unfolds' and the main aspects of the story are presented and discussed. The end of the story usually contains an important message that the storyteller wishes to convey to the audience. There are close parallels of these stages with the phases required for effective reflection.

The use of reflective writing for reflection in undergraduate medical students has been described (DasGupta & Charon 2004) and also in continuing medical education (Bolton 1999).

For an example of instructions to use digital storytelling for reflective learning, please see Appendix 2, available at www.medicalteacher.org.

Personal development plans and portfolios

There has been increasing use of structured approaches to both encourage and assess reflective learning in postgraduate and continuing medical education (Rughani 2001). Often these approaches are essential components of training, certification or revalidation. The approach requires that learning needs are initially identified and then decisions are made as to how these needs can be met. Reflection is an essential aspect of the process and this can be included in the structured approach. For example, there can be several questions that can prompt reflection on current knowledge or skills.

(i) Identification of learning needs. Most professionals will have a wide range of experiences that will enable them to identify their learning needs. These include self-awareness of how they respond to situations, such as thoughts about what situations they find challenging, significant events, feedback from colleagues and patients, prescribing and referral audits, and quizzes.

(ii) Developing a plan to meet the identified learning needs. Several educational interventions are chosen and these are usually prioritised. For example, an identified learning need of not having knowledge about the latest treatment for diabetes would prompt the learner to seek further information, such as by attending a training course or reading an article.

A portfolio provides a collection of the various pieces of evidence to prove to an assessor that learning needs have been identified but, more importantly, have been met by appropriate educational approaches (Moon 1999). It is useful to have all of this information in one place but it is also easy to regard a portfolio as not helping the learner. The advent of e-portfolios has enabled a more flexible and user-friendly approach to collection of evidence. It is now easier to upload a

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wide range of materials to stimulate reflection, such as photographs or audit reports, to record the reflections and to keep a dynamic record of how these reflections have influenced professional practice.

For examples of templates to structure reflection and questions to develop deeper reflection please see Appendix 1, available at www.medicalteacher.org.

Assessment of reflection

Assessment is a process that requires a judgment to be made about the standard of an outcome and has relevance for reflection in medical education. Formative assessment is an integral aspect of giving feedback and it also offers the identification of further learning needs. Summative assessment occurs after a period of study and this may be required for reflection, such as in undergraduate course curricula. Students dislike the notion of assessment of their reflective activities, regarding their entries as private but also they are sceptical about whether the assessment approach can be valid and reliable. Validity considers whether the assessment is measuring what it is intended to measure and reliability that the result of the assessment is consistent between markers and time. Students readily recognise that written reflection, such as in reflective diaries, may not be an accurate account of the thoughts and emotions of the writer.

Despite the concerns of students, assessment of reflection may be required for a variety of purposes and an overall framework can be useful. Most assessments will incorporate 'levels of reflection' and this hierarchical model is based on the concept of depth of reflection. Superficial reflection is considered to occur when there is only description of events but deeper reflection includes a 'stepping back' from events and actions with evidence of challenge, and possibly change, to existing beliefs and perspectives. This deeper level is equivalent to when 'transformative learning' takes place.

Two approaches to categorising reflective material are provided as illustrative examples. The first approach is based on the observed stages in professional development (Box 2) and the second a more pragmatic approach (Box 3).

Box 2. Categorising reflective material based on stages in professional development (after Niemi 1997).

Committed reflection. There is a discussion of what has been learned, how it has affected the individual and how they feel that they have changed. Some presentation of evidence to back this up should be provided.

Emotional exploration. There is evidence of the emotional impact of an experience and this includes insights and discussion about their own beliefs and values, including how these have been challenged.

Objective reporting. There is only a descriptive account of what happened during the experience with no evidence of reflection, or how the experience has affected them.

Diffuse reporting. The description is unfocused or disorganised and contains only a description of the experience.

Box 3. A pragmatic approach to categorising reflective material (after Moon 2004).

Grade A: Experiencing an event(s) has changed, or confirmed, how you experience an event(s). You may wish to change how you respond to similar event(s in the future. You provide an explanation, including references to other literature, eg articles or books.
Grade B: Involves judgement – what went well, or less well and why.
Grade C: Describing an event – recognising how it affects your feelings, attitudes and beliefs and/or questioning what has been learnt and comparing it to previous experience.
Grade D: Describing an event – recognising that something is important but not explaining why.
Grade E: Describing an event – repeating the details of an event without offering any interpretation.
Grade F: Describing an event – poor description of an event.

Common problems encountered with reflection in medical education

The use of reflection in medical education is associated with several problems and these will be discussed with an emphasis on practical solutions.

Low engagement in reflection

How to engage individuals in reflection appears to be a persistent challenge to all educators. The model of self-regulated learning provides a useful overall framework to understand low engagement. Effective reflection will only occur when there is alignment between the various components. The main components of the self-regulated learning model are the goal, the 'will' (the motivation) and the 'skill' (the monitoring of strategies).

Individuals may not be clear of the overall goal of their reflection and this is made worse if their supervisors are also uncertain. Unfortunately, reflection is often seen as a 'bolt on' extra and something that has 'to be done', especially for the purpose of assessment. The process and outcomes of reflection that has the goal of identifying knowledge learning needs will be different to that required to develop a therapeutic relationship.

Motivation is complex and includes both internal and external factors. Internal motivation includes intrinsic interest in the activity, self-efficacy (a self-belief in being able to achieve the task) and the perceived difficulty of the task. The ability to reflect appears to be developmental and usually most individuals find it difficult without regular practice. There is also a maturational effect in which there is a tendency for younger learners to reflect on events in more absolute terms rather than consider the wider context and the possible implications. External factors include the support and encouragement by the organisation within which the individual is learning and working. This aspect also includes the role of facilitators and confidentiality.

Strategies for self-monitoring require individuals to take an 'executive function' that ensures that the key aspects of noticing, processing and future action are considered. Research into the conscious use of metacognition by students has identified similar difficulties when they try to increase awareness of the process. This has been addressed by specific training that progressively introduces learners to the use of metacognitive monitoring. These strategies have the aim of

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making the metacognitive process explicit and include encouraging learners to talk aloud about the phases of reflection whilst reflecting and keeping a 'thinking' journal so that the various phases can be identified and discussed. An initial briefing of the metacognitive process of reflection may provide a useful template and prompt. A facilitator or mentor is also invaluable if they are able to encourage the learner to model their own metacognitive processing approach.

Although several authors have noted low engagement in reflection, students state that they perceive that they are already doing it and that the written process does not align to their learning preferences (Grant et al. 2006). A recent study of first year medical students has highlighted that 'Net Generation' learners have a preference for group based and creative activities rather than using written text based approaches (Sandars & Homer 2008). Experience with the use of multimedia (audio, photographs and video) and its creative use for reflection, such as in digital storytelling, appears to not only increase student engagement but also increases the depth of reflection (Sandars et al. 2008).

Individuals have a variety of preferred ways to present thoughts and emotions. These include drawing, painting, photographs and sculpture (Gauntlett 2007). Being creative can liberate many learners and it transcends barriers due to language, such as cultural meanings and difficulty in putting thoughts into words. This is particularly important when the topic is associated with strong emotions.

Difficulties with the phases of reflection

There may be difficulties in the various phases of the reflection process. Difficulties in the noticing phase can often be related to the lack of adequate feedback. Although students state that they wish to receive feedback from others there is a reluctance to give feedback. This may result in students either not receiving feedback, or receiving it in a form that does not help the learner to reflect. Effective techniques in providing feedback include providing specific examples using a non-judgmental way (Westberg & Jason 2001). Failure to do this may result in the creation of strong emotions that may block the rest of the reflection process.

There may be difficulties with the processing phase of reflection. A common difficulty is the presence of strong emotions that the event has produced in the learner. Often the most important events, such as a missed diagnosis, that can stimulate reflection are also those that are associated with the most powerful emotions, such as anger or sadness. An essential step is to recognise and release these emotions since they can block further reflection (Boud et al. 1985). This process can lead to defensiveness in the learner and important underlying issues may not be addressed, such as fear of saying 'no' to patients. A trained supervisor or mentor can be invaluable. Hindsight bias has been noted to be a possible difficulty but this is related to the wider issue of retrospectively trying to make sense of previous situations and events (Jones 1995). Experimental evidence highlights that often there is poor memory recall of past events and this may be further altered by the presence of powerful emotions. In addition, attribution of events is constantly mentally processed after an event. There is no simple answer to this dilemma since all reflection is based on a constructed view of the world.

A structured process to reflection can be very useful and there are several frameworks. These frameworks allow a progressive deepening of reflection by the use of prompts.

Although reflection may lead to increased understanding of a situation, it is essential that these insights can inform future encounters with similar situations. A particularly powerful part of the reflection process is when the insights inform a future action and there is reflection of the consequences of this action. This is the beginning of a cyclical process and deeper reflection can occur. Action or practitioner research involves a cyclical process in which greater understanding (and the development of personal theory) can be iteratively developed through action. The ultimate aim of this process is to improve professional practice but other intentions can also be met, such as when learning needs have been identified, new information or skills have been acquired and then applied to the real life situation. There is often a difference between what is taught in a classroom situation and then applied to another context.

Lack of integration of reflection in overall teaching and learning approach

Reflection is often a 'bolt on' extra to a teaching session or a curriculum. The effect is that both tutors and learners begin to regard reflection as a process that is disconnected from the educational process. There is not only poor engagement but a culture, often called a hidden curriculum, can quickly develop that devalues reflection. It is important that reflection becomes an integral part of each session and the overall curriculum. The curriculum includes the underlying philosophy about what type of learner it intends to develop, the various approaches to delivery and the assessment strategy. This has implications for tutor development and course developers. In healthcare education, reflection is also often regarded as only related to certain aspects of the curriculum, such as communication skills or clinical attachments, but there are opportunities for integration into preclinical teaching.

Further development of reflection in medical education

Further research is recommended to compare different approaches for reflection, including facilitator supported and the use of new technologies. It is also important to evaluate the impact, both subjective and objective, on attitudes and behaviour, but first it will be essential for educators to clarify the intended purpose of reflection to enable appropriate outcome measures to be used or developed.

The impact of healthcare educational interventions on clinical care is of increasing interest both to educators and funding agencies. There appears to be little evidence generated that has attempted to answer this important question. Further research is recommended since failure to address this issue will result in an increase in the scepticism of clinicians and this, in turn, can produce a culture where the role of reflection in medical education is not valued.

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Engaging undergraduate students in reflection is a major challenge and the use of digital multimedia (audio, photographs and video) combined with new technologies, such as blogs, social networking sites and podcasts, has the potential to not only increase motivation by this group of learners but to facilitate deeper reflection. Further research is recommended. There are also challenges into how multimedia artefacts can be assessed compared with written reflective assignments.

Understanding reflection as a metacognitive process allows a wider appreciation of how reflection can be developed and researched. An essential aspect of reflection is noticing and research on impulsivity in other educational contexts highlights that increased impulsivity leads to reduced learning outcomes. However, this can be reversed when learners are made aware of the tendency and receive training in cognitive strategies to consciously slow down their learning. Closely linked to this concept is situational awareness in which individuals become aware of various cues in the environment but an initial, and essential step, is noticing. Situational awareness has been extensively studied in aviation and increasingly its importance has been recognised in patient safety work. Further research is recommended to identify whether there is an association with metacognitive processes across educational and practice domains.

Conclusions

Reflection is an essential component of medical education and it has a variety of intended outcomes and approaches. Important aspects of reflection include its use before, during and after experiences. Reflection can be developed by individuals but guided reflection with a supervisor or mentor is important so that underlying beliefs and assumptions can be challenged within a supportive relationship. The approach to reflection should be determined by the individual since there are different preferred approaches, especially in medical students. Although there is no evidence to suggest that reflection actually does improve patient care it seems logical and likely since the process of care can be influenced.

Notes on contributor

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Further reading

www.infed.org. The Encyclopedia of Informal Education is a non-profit on informal learning theory. There are excellent articles on the key aspects of reflection in education and the major thinkers.

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