Reflection for medical undergraduate: learning to take the initiative to look back to go forward

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Abstract: Perhaps reflection can be dated to early days of the appearance of humanity in this universe. This can be seen in the Egyptian and Sudanese Nubian pyramids, which contain a lot of photos and stories of events that have significant and meaningful messages. Different definitions of reflection can be found in the literature. Perhaps all these definitions aim to encourage health professionals to use reflection to make sense of the entire situation of events in their daily practice. Reflection as a subject needs to be taught not only for undergraduate medical students but also for basic scientists and clinical staff. This because reflection was shown to promote deep learning, increase core medical knowledge and enhance the therapeutic relationship with patients. Also, reflection represents a core part of many learning theories like transforming learning theory, motivational models, reflective models, Bloom's taxonomy, Miller's pyramid and the adult learning model. Despite all these benefits of reflection, one problem with reflection is the low engagement of medical undergraduates in reflection. This narrative review will discuss the following (I) different definitions of reflection; (II) the importance of reflection in medical education; (III) common problems with implementations of reflection; and (IV) how to encourage undergraduate medical students to engage in reflection.

Keywords: Medical education; reflection; undergraduates

Introduction and definition of reflection

Sandars [2009] defined reflection "metacognitive process that occurs before, during and after the situation with the purpose of developing a greater understanding of both the self and the situation so that future encounters with the situation are informed from previous encounters" (1). The General Medical Council (GMC) recommended that health professionals need to have the ability to reflect (GMC-2018) (2). Other definitions were also generated by Dewey [1938], Boud *et al.* [1985], Atkins & Murphy, Mezirow, Schön, Korthagen, Stockhausen, Mamede and Schmidt, Koole *et al.* [2011] and Moon [2004] (3-13). In brief, these definitions and theories of reflection can be broadly categorised into three groups (I) cycle theories (by Atkins & Murphy, Boud,

Korthagen) where reflection is composed of cycles of events (II) Model theories (by Stockhausen, Mamede and Schmidt, Koole) and here the process of reflection can go through models (III) mental theories (by Moon and Sandars). This difference in definitions and theories and the problem with linking theories with practice may represent one part of the different causes of universal lack in agreement about the best way to assess reflection. The agreement between all these definitions of reflection can be summarized in *Table 1*.

Feedback is common practice in medical education. For instance, feedback provides the basis for correcting mistakes, clarifying goals and reinforcing good practices. The feedback will be of considerable benefit if the student can reflect and effectively make sense of the situation and the learning (14). In addition, reflection

Table 1 Summary of all the definitions of reflection

Reflection is an active mental process

Reflection involves metacognitive function and relates to intellectual activities

Reflection is an active learning process

Reflection is a process that can be controlled

Reflection can be done before, during and after learning

Reflection is likely to be stored in the long-term memory. Therefore, is likely to help in better understanding of the self and situation. This important for the clinician in learning about a clinical procedure and breaking bad news and how to be sympathetic and compassionate

Reflection will increase experiential learning

Reflection is part of the Kolb learning cycle (feeling, observation and reflection, thinking and finally testing and doing

The main aim of reflection is to make sense of the situation. Therefore, reflection should be an integral part of the learning process as it has a definite purpose

represents a core part of many learning theories like transforming learning theory, motivational models, reflective models, Bloom's taxonomy, Miller's pyramid and the adult learning model developed by Taylor and Hamdy in 2013 (15-17). Therefore, reflection is one of the methods of providing formative feedback. In this review, I will elaborate on the importance of reflection in medical education, strategies to encourage reflection among undergraduate, assessment of reflection and common problems with reflection.

Reflection in medical education

There is a lot of benefit of reflection and this can be explored with a medical undergraduate in order to obtain a sense of appreciation for the importance of their education and lifelong leanings. For example, the therapeutic relationship is key to the success of clinician with his patients and carers through showing empathy and care. For an undergraduate guided reflection by a mentor will able to pass skills of how to develop a therapeutic relationship with patients (18,19). It worth mentioning, guided reflection for undergraduate was associated with greater help in improving performance in obstetrics and gynecology and the therapeutic relationship. Furthermore, undergraduates need to develop core knowledge about medicine and this can be achieved through experiential learning which requires integration of existing and new knowledge (20). This likely to be achieved successfully through reflection. Importantly, reflection is also the essence of lifelong learning and allows medical professionals to be expert in complex medical problems (21). For example, attending the medical meeting in one subject (for example multi-disciplinary cancer meeting) will enhance the knowledge of the medical team and it is likely that their knowledge will increase in the same frequency as they engage and reflect in these meetings. Dent *et al.* [2017] mentioned that reflection could be integral to feedback and this due to: (I) encouraging learners to reflect will make them use feedback in correct manner; (II) reflection on feedback can lead to informed self-assessment that can lead to critical self-assessment that can lead to increase in performance; (III) reflection on feedback can lead to self-appraisal or self-mentoring skills (22). Therefore, encouraging undergraduate to reflect and to learn about reflection will not only increase their skills in active medical learning but will also allow them to contribute in different non-clinical roles in their future career in their hospitals.

Common problems with implementation of reflection in medical school

One of the problems I encounter with our student is low engagement in reflection. This may be attributed to different factors like lack of motivation, lack of awareness of students of the importance of reflection. Importantly, some educational supervisors are also not aware of the importance of reflection for the learning process of the students. Due to the increase in pressure on medical students to complete portfolio some students may elect to engage in other portfolios activities assuming it's more important than reflection (1,23). This can be attributed to the fact that

reflection is a formative assessment that can enhance or increase learning and experience. It is not like summative assessment [multiple choice question (MCQ) or best of five questions] that deal with a pass and fail and needed to demonstrate attainment of the particular standard. Validity, reliability, and utility of assessment are common parameters of assessment in medical education. Reliability is about the quality of results and whether the results were consistent and reproducible. High reliability can be seen in summative assessment and it can be low in formative assessment. While validity is about does the test measure what it set out to test. Van der Vleuten and Schuwirth [2005] described the utility of assessment methods as an outcome of multiplying reliability, validity, feasibility, education impact and cost-effectiveness (24). There is general agreement in the literature that assessment of reflection was associated with uncertainties. Koole *et al.* [2011] have summarised four factors to be associated with difficulties in providing a comprehensive assessment for the refection (25):

- ❖ The lack of standards in defining the reflection and the gap between theory and practice;
- ❖ Currently, there is no national or international agreed standard to evaluate the current tools for assessment of reflection;
- ❖ Lack of validity of current methods of assessment of reflection;
- ❖ Internal and external contextual factors like appraisal, reward and revalidation process.

Another problem is difficulties with phases of reflection. For instance, if someone asked to reflect on missed diagnosis, it's important to remember this can be associated with strong emotions. In my own experience, it's possible that individuals may engage well in all phases of reflection but he or she will not receive feedback. This may negatively influence the motivation of the individual if he was asked again to reflect. It is possible that reflection can be decreased by poor memory recall of previous events. Perhaps one of the important problem related to reflection is clear lack of integration of reflection in throughout the duration of the curriculum of the medical school. As a graduate of a medical school (University of Gezira, Sudan) that based its curriculum on problem-based learning (PBL) and community-oriented learning, the curriculum was full of reflection and integration to the extent that I recently come to appreciate this while I am preparing this review (26). For instance, while we attend PBL sessions we have to learn before the session about the objectives and learning

goals, during the session you learn from different styles of learning of other students and enjoy their approach in solving the problem, after the session you will also reflect on the learning outcomes and how this changed your practice (27). The community-oriented learning in particular the interdisciplinary field training research and rural development course in faculty of medicine, University of Gezira was another experiential learning that was full of integration and reflection. In phase one of this programme, we will spend 3 days (year 2 in the medical school) in one of the villages that not far away from the medical school. Normally this will be done by a group made of 6 students. The goal of this phase was to identify the main health problem in this village. At that time, we had the opportunity to listen to the reflection of the peoples in the village, a senior administrator in the village and if available the medical profession in that village. Once you are back to medical school you do narrative reflection in your findings of the village in front of the whole class in the presence of tutors from different specialties including public Health Physician (27,28). The main aim of the narrative reflection was to establish ways of helping the village in solving the problem. Phase two (year 3 in the medical school) will be spending another 3 days in the village to try to implement the suggested solutions for the village. While in year 4, the focus was on assessment and evaluation of the impact of the solution in the health problem of the village. The students will need to produce a detailed report about how their intervention contributed to the promotion of the health in that particular village. In the modified curriculum of Faculty of Medicine, University of Gezira, this program was decreased to two phases and named Integrated Program of Field Training, Research & Rural Development (29). Indeed, during the preparation of the report, the students will be engaged in detailed and long reflections. Perhaps the early community exposure if I may reflect on this issue, created that sense of contribution and belonging to the community. This may explain why in my current job in Milton Keynes University Hospital, UK, I am also involved in knowledge transfer to my home country in Africa.

Strategies to encourage reflection among undergraduate

In most of medical schools around the world, portfolio is now popular platform for reflection. Several studies showed that portfolio can enhance engagement of reflection not

only in medical students but also among dental and nurse students. Reflection can also enhance academic performance in social, community medicine, increase self-awareness and relationship between students and supervisors (12,23). Beside the fact that reflection in portfolio will help student to be confident in postgraduate studies, portfolio was shown to be a valuable method of assessing and developing reflective skills for undergraduate (30,31).

Despite the numerous benefits of reflection for undergraduate not many students were keen to engage in reflection. This can be attributed to factors related to students and supervisor. For instance, in busy hospitals clinician may struggle to find the time to teach medical students let alone read and feedback about students' reflections. One can argue that in the era of student centred curriculum this should not be an important factor. Hence the most important part is how student perceive reflection. As it is not summative assessment and some student find reflection time consuming, these may decrease students' participation in reflection. It is also important to ensure that students were already taught about the benefit of reflection. Reflection is a skill that should be taught in all medical schools regardless which curriculum (traditional, PBL curriculum or community-oriented curriculum) being adopted. Reflection is incorporated in the curriculum of Dundee Medical School, UK (reflective 100 clinical cases, reflective essays and case reports) (32). Therefore, strategies are needed to encourage reflection among undergraduate students. The following are examples of these strategies:

(I) Supervisors need to learn about the benefit of reflection, guided reflection for undergraduate and how to assess reflection;
(II) Students also need to learn about benefit of reflection (personal and professional development, skills of storytelling, research skills and academic writing and enhancing communication skills);
(III) Most medical schools included learning modules that encourage undergraduate to engage in reflection.

Conclusions

Reflection is an important and essential component of the medical education. Medical undergraduate should be taught about reflection and how important it's for their medical career. Reflection is meta-cognitive function and if students were coached to do it well, this might provide the graduate with different skills (managers, researchers,

clinician and medical educators). This important due to the reflective nature of the hospital environment and National Health Service (NHS) in the UK. Reflection will enhance deep learning and increase experiential learning. Reflection is the only route by which the individual will move from novice to expert in his specialty. Unfortunately, not many undergraduates are involved in reflection due to different reasons discussed above. One of them is the fact that there is uncertainty about the methods of assessment of reflection. The lack of validity of methods of assessment was attributed to the meta-cognitive nature of reflection. This *per se* should not discourage medical educators to promote and teach reflection among undergraduates.

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Footnote

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