

MEDICAL EDUCATION

PORTFOLIO: AN INNOVATIVE TEACHING, LEARNING AND ASSESSMENT TOOL IN MEDICAL TRAINING

K.N. Marambe¹

¹Medical Education Unit, Faculty of Medicine, University of Peradeniya, Peradeniya, Sri Lanka

Corresponding Author: Dr. K.N. Marambe, Email: kosalnm@yahoo.com

Background

At present we witness many changes in medical education and training in order to cater to the growing needs of the medical profession and the society as a whole. In the higher education arena the trend is to move towards student-centered learning, where students are encouraged to take responsibility for their learning and professional development. Hence learners are provided with opportunities to personalize learning experiences.

Furthermore, General Medical Council, UK in its recommendation advocates the development of professional attributes such as active learning, critical thinking and reflective practice among trainees¹. Portfolio is an attempt to encourage the development of such attributes among health professionals. In this approach, the learner is made to identify his/her learning needs through reflection, and is encouraged to pursue self-directed learning. More importantly, the portfolio writing exercise allows learners to learn aspects which are relevant to their day to day work in a meaningful way.

Educational theory

Malcom Knowles² in describing Andragogy, ‘the art and science in helping adult learning’, recommended that those involved in teaching adults follow the guidelines stated below:

- Involve learners in diagnosing their own needs as such acts will help to trigger internal motivation
- Encourage learners to formulate their own learning objectives—this gives them more control of their learning
- Encourage learners to identify resources and devise strategies for using the resources to achieve their objectives
- Support learners in carrying out their learning plans
- Involve learners in evaluating their own learning—this can develop their skills of critical reflection.

The portfolio development process is known to have incorporated the stated principles of adult learning into instruction and assessment with much success. In this background, portfolio-based learning has gained momentum in all stages of Medical Education, namely, undergraduate, post graduate and continuing professional development.

What is a portfolio?

Davis and Ponnampuruma describe it as ‘a collection of work of a learner, which provides evidence of achievement of knowledge, skills, attitudes, understanding and professional development through a process of self-reflection over a period of time’³.

Stated below are two of the available definitions of a portfolio⁴.

“A collection of papers and other forms of evidence that learning has taken place”, “It is a purposeful collection of student work that exhibits the student’s efforts, progress and achievements in one or more areas. This collection represents a personal investment that is evident through the student’s participation in the selection, the criteria for judging the merit of the collection and the student’s self-reflection.”

In summary, portfolio is both a powerful learning and assessment tool, which is capable of capturing students’ learning in action. Key elements of a portfolio are the learner experiences and the reflections made on one’s actions. The reflections steer the learning process as well as the evidence of learning.

Educational advantages of portfolios

Portfolios are advertised as the instrument par excellence to enhance integrated, self-reflective, self-directed, longitudinal learning⁵. It enables assessment of achievement of most of the program outcomes, specifically competencies such as self-regulated and lifelong learning and professional development. Like many complex skills, self-reflection is probably best learned by doing and preferably over an extended period of time. One of the highlighted strengths of this method is its ability to make a comprehensive assessment of student performance.

‘Portfolios can become a window into the students’ heads, a means for both staff and student to understand the educational process at the level of individual learner. They can be powerful educational tools for encouraging students to take charge of their own learning’⁶.

“Portfolio offer a way of assessing student learning that is quite different from

traditional methods. Achievement tests offer outcomes in units that can be counted and accounted portfolio assessment offers the opportunity to observe learners in a broader context: taking risks, developing creative solutions and learning to make judgments about their own performances.”⁶

Use of portfolios in medical education

Many medical schools, for example, Faculty of Medicine Dundee, UK, Maastricht Medical school in the Netherlands, University of New South Wales, Australia, JIPMER, Pondicherry, India and International Medical University, Malaysia use portfolio as a means to train and assess undergraduate medical students.

With respect to postgraduate education, the Royal College of Physicians and Surgeons of Canada introduced a learning portfolio, to create opportunities for personal learning. Not only in the West, the Postgraduate Diploma in Medical Education conducted by the Postgraduate Institute of Medicine (PGIM) Colombo is portfolio based. It is heartening to note that in keeping with the trend, most of the boards of study at the PGIM are in the process of introducing portfolios as part of learning and assessment in the post graduate programs. Since development of a portfolio depends on learners’ experiences and guided reflection, it is also an ideal tool to be used for continuing professional development and revalidation purposes.

Process of learning

Portfolio encourages learners to learn more through their own experiences. According to Kolb⁷, the experiential cycle starts with one’s own experience, followed by the reflection one makes about the specific situation (**Figure 1**). The subsequent step of the

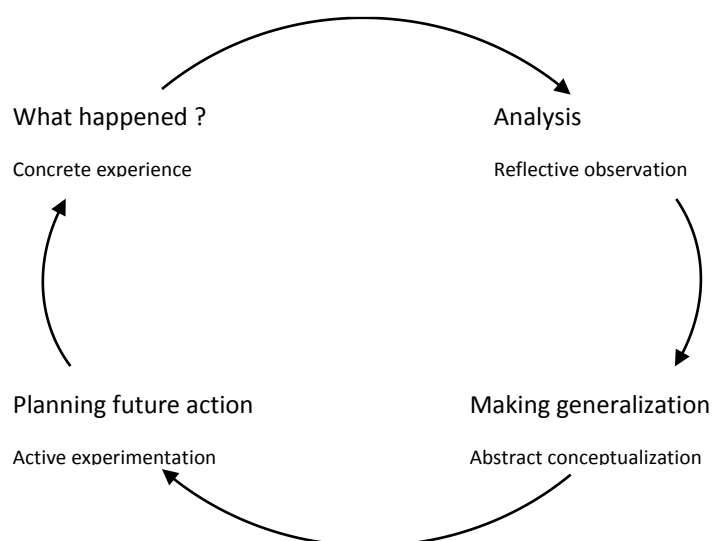


Figure 1. Kolb's learning cycle

learning process is identifying gaps in knowledge, skills or attitudes as the case may be. This leads to the next step, which is to draw up a plan to achieve the identified gaps in learning. Thinking of many options and prioritizing, selecting what should be done in the given context. The learner then executes the plan in order to accomplish the set goal.

Later the portfolio entry is completed with reflection on the entire process and accumulating evidence to show how he/she has accomplished his or her plan. In addition, learners are also encouraged to record failures and possible reasons as to why it is so. May be those become a learning experience for the second cycle, eventually resulting in a spiral.

What kind of material could be included in a portfolio?

It could be printed or electronic material that could be considered as evidence of actual work carried out by the student/trainee such as;

- Case reports

- Best essays
- Published work, research reports
- Awards and certificates of participation in seminars, conferences etc.
- Letters of recommendation
- Log book entries on practical procedures undertaken/ performed
- Completed evaluation forms - Self, peer, Mini Clinical Examination (MiniCEX) feedback forms, patient satisfaction records
- Video tapes of consultations

What do the learners and examiners say about portfolio based learning and assessment?

Literature on student perceptions of portfolio development process indicate that at undergraduate level, students are concerned about the high load of paper work which they have to manage along with their clinical training⁸.

Nevertheless, according to a study carried out in the International Medical University (IMU), Malaysia, although students have reported that the portfolio development

process is time consuming and stressful, a majority of the students rated portfolio as a good learning tool⁹. Literature also reveals positive effects on enhancing learning among undergraduate students at JIPMER, Pondicherry, India following the use of portfolio based learning and assessment in community based field work¹⁰.

A recent review of literature on educational effects of portfolios on undergraduate student learning concluded the main educational benefits as improvement in knowledge and understanding, increased self-awareness and engagement in reflection and improved student teacher relationships¹¹.

It is believed that with a good induction program and careful planning of its content, portfolio has great potential for high quality learning. Supervisors play a crucial role during the mentoring process and it seems to be extremely demanding at times with increasing numbers of students¹². Nevertheless, Portfolio ensures workplace based learning and a more holistic assessment of the trainee¹³.

Examiner perceptions of portfolio over a three year period carried out at the University of Dundee has revealed that portfolio process provides a holistic picture of the candidate and with adequate briefing of the co-examiner could agree upon the student grade, ensuring validity and reliability of the assessment tool¹².

A recent review by Dreissen reported quite good inter-rater reliabilities of portfolio assessment, which is contrary to the widespread belief that portfolio assessment is 'subjective'. Results were also encouraging regarding the combined use of portfolios for learning and summative assessment^{14,15}. Thus it can be concluded that portfolio is a desirable learning and assessment tool for

professional courses of study and revalidation purposes.

Practice points

- Portfolio implementation has to be well designed and sustained with high level organizational support for greater effectiveness
- A flexible learner-centered format is preferred over a highly structured format as it could have a positive educational impact on learners
- A well orientated and committed mentor would enhance effective learning
- Summative assessment of portfolio contents can be reliable with multiple raters; however, it may be desirable to triangulate with other sources of assessment.

It is advised that those who plan to introduce portfolio-based learning and assessment organize a good induction program for students and staff both. Such a measure would allay anxiety among trainees and pave the way for promoting lifelong learning among health professionals.

References

1. General Medical Council 2009. Tomorrow's Doctors: Recommendations on undergraduate medical education. London: General Medical Council. Retrieved October 21, 2009, from http://www.gmc-uk.org/Education/Undergraduate/tomorrows_doctors.asp
2. Knowles, M.S. and Associates. Andragogy in action; applying principles of adult learning. San Francisco: Jossey-Bass, 1984
3. Davis MH, Ponnampetuma GG. Portfolios, projects and dissertations in Dent, JA and Harden RM. A practical guide for

medical teachers (2nd ed). Elsevier Churchill Livingston, 2005: 346-356

4. David MFB, Davis MH, Harden RM, Howie PW, Ker J and Pippard MJ. AMEE Medical Education Guide no. 24: Portfolio as a method of student assessment. *Medical Teacher* 2001; **23**(6): 535-551

5. Maastricht University. Can a portfolio stimulate and assess reflective skills? *Newsletter, School of Health Professional Education*, January, 2008

6. Paulson FL, Paulson PR and Meyer CA 1991. What makes portfolio a portfolio? <http://web.stanford.edu/dept/SUSE/projects/i-report/articles/e-portfolio/what%20makes%20a%20portfolio%20a%20portfolio.pdf> downloaded on 15th Jan 2015

7. Kolb DA. Experiential learning theory and the learning style inventory: A reply to Freedman and Stump. *Academy of Management Review* 1981; **6**(2): 289-296

8. Davis MH, Ponnampereuma GG and Ker JS. Student perceptions of a portfolio assessment process. *Medical Education* 2009; **43**: 89-98

9. Elango S, Jutti RC, Lee LK. Portfolio as a learning tool: Students' perspective. *Annals Academy of Medicine Singapore* 2005; **34**: 511-514

10. Sahu SK, Soudarssanane M, Roy G, Premrajan K, Sarkar S. Use of Portfolio-based Learning and Assessment in Community-based Field Curriculum. *Indian Journal of Community Medicine* 2008; **33**(2): 81-84

11. Buckley S, Coleman J and Davison I et al. The educational effects of portfolios on

undergraduate students learning: A best evidence medical Education (BEME) systematic review. BEME guide No.11 *Medical Teacher* 2009; **31**: 340-355

12. Davis MH and Ponnampereuma GG. Examiner perceptions of a portfolio assessment process. *Medical Teacher* 2010; **32**: e211-215

13. O'Sullivan AJ, Harris P, Hughes CS, Toohey SM, Balasooriya C, Velan G, Kumar RK and McNeil P. Linking assessment to undergraduate student capabilities through portfolio examination. *Assessment & Evaluation in Higher education* 2012; **37**(3): 379-391

14. Tartwijk JV & Dreissen EW. Portfolios for assessment and learning: AMEE guide no. 45. *Medical Teacher* 2009; **31**: 790-801

15. Driessen E, Tartwijk JV, Van Der Vleuten C, Was, V. Portfolios in medical education: why do they meet with mixed success? A systematic review. *Medical Education* 2007; **41**(12): 1224-1233