

## Students' Perception of the Portfolio as a Method of Teaching and learning Assessment in the Newly Established Egyptian Medical Program

تصور الطلاب للمحفظة كأسلوب لتقييم التدريس والتعلم في البرنامج الطبي المصري  
المنشأ حديثاً

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## Abstract

**Background:** Portfolios are collections of intentional and meaningful artefacts that represent personal efforts, professional development, and achievements. Portfolios are used to document students' learning, growth, and development throughout time, as well as to promote reflective practice and professional certification. **Purpose of the study:** Investigating how first- and fifth-year medical students at New Giza University perceive portfolios as a way of teaching and learning assessment in the newly constructed Egyptian Medical Program. **Materials and Methods:** A self-administered anonymous questionnaire was provided to first- and fifth-year students, and the results were analyzed.

**Results:** In terms of the impact of portfolios on the learning process, the majority of students reported that portfolios are not an effective means of learning, teaching, and assessment; however, they agreed that organizing the portfolio helped them improve their organizational skills and documentation's ability to provide a comprehensive view of the full scope of the professional competencies required for clinical specialization. Concerns were raised about the time spent preparing for the portfolio requirement, as well as the relationship between the reflection task and the learning process.

**Conclusion:** Students are unaware of the significance of portfolios and its relevance to their learning. A proper introduction to the portfolio is required, along with clear description of portfolio objectives and more specific activities.

**Keywords:** Portfolio, Medical Education, Assessment.

## المستخلص:

الخلفية: المحافظ عبارة عن مجموعة من الملفات المعده بواسطه و التي تمثل الجهود الشخصية والتقدم المهني والإنجازات. يتم استخدام المحفظة لتوثيق تعلم الطلاب ونموهم وتطورهم بمرور الوقت، وتعزيز الممارسة التأملية، والشهادات المهنية. الهدف من العمل: تقييم تصور طلاب الطب في السنتين الأولى والخامسة بجامعة نيو جيزة تجاه المحفظة كطريقة لتقييم التدريس والتعلم في البرنامج الطبي المصري المنشأ حديثاً. المواد والطرق: تم توزيع استبيان على طلاب السنة الأولى والخامسة وتم تحليل البيانات المجمعمة. النتائج: فيما يتعلق بتأثير المحفظة على عملية التعلم، أفاد معظم الطلاب أن المحفظة ليست وسيلة جيدة للتعليم و التعلم والتدريس والتقييم، ومع ذلك، فقد اتفقوا على أن تنظيم المحفظة ساعدهم على تحسين مهاراتهم التنظيمية وقدرة التوثيق على تقديم رؤية شاملة للنطاق الكامل للكفاءات المهنية المطلوبة للتخصص السريري. وقد لوحظت مخاوف بشأن الوقت المستغرق في إعداد متطلبات المحفظة وحول علاقة مهمة التفكير بعملية التعلم. الاستنتاج: الطلاب غير مدركين لأهمية المحفظة وعلاقتها بتعلمهم. هناك حاجة إلى مقدمة مناسبة للمحفظة مع تحديد واضح لأهداف المحفظة ومهام أكثر وضوحاً.

الكلمات المفتاحية: المحفظة، التعليم الطبي، التقييم.

## Introduction

Portfolios are collections of evidence and reflections that students use to show the results of their various learning and assessment activities. A portfolio is an effective tool to evaluate personal and professional accomplishments. They are regarded as a strategy developed by students who must acquire evidence that allows them to evaluate their attitudes, talents, and competence, as well as the learning process itself <sup>[1]</sup>.

Portfolios allow students to provide actual proof of what they know and can do while also appearing to be reliable sources of information regarding what professors are teaching and what students are learning <sup>[2]</sup>. Portfolios raise students' awareness of their learning, hence creating opportunities for self-improvement <sup>[3]</sup>. The literature suggests that portfolios are a useful tool to assess learning, and students preferred the portfolio as an alternative way of evaluation. However, the relationship between theory and practice was not as strong as expected <sup>[4]</sup>.

According to Joshi et al. (2015 <sup>[5]</sup>), portfolios are classified into three categories. This learning portfolio includes the learner's reflections on their learning experiences. These portfolios are designed only for the benefit of the student and may not be suitable for use in training programs. The showcase portfolio is designed to highlight only the greatest work. Portfolios like these are used to conduct summative assessments. The assessment portfolio records the student's progress alongside reflection on specific learning objectives such as knowledge, skills, and attitude.

A previous study found that the influence of reflecting on performance (case-solving capacity) was both minor and considerable <sup>[6]</sup>. Furthermore, it was found that reflection facilitated learning but was only slightly related to improved academic achievement <sup>[7]</sup>. The portfolio has also been utilized in undergraduate programs to get insights into the hidden curriculum, such as keeping track of the behaviors and values taught or transmitted through role modelling <sup>[8]</sup>.

According to Bolliger and Shepherd 2010 <sup>[9]</sup>, electronic portfolios (e-portfolios) are widely used to help students improve critical thinking and problem-solving skills while also preparing them to be lifelong learners. They can include any content that displays educational and professional qualifications. This could include best essays, written reports or research projects, performance evaluation samples, records of practical procedures undertaken (logbooks), annotated patient records, letters of recommendation, CVs, and written reflection on evidence and professional growth <sup>[10]</sup>.

At the beginning of the first academic year, the School of Medicine at New Giza University (NGU) hosts an information session regarding the portfolio, its importance, and how to build it. The portfolio requirements are announced at the start of each module, as well as the submission deadline. To be eligible for the exam, you must submit your portfolio.

## Aim of work

The present study seeks to analyze the perceptions of first- and fifth-year medical students at New Giza University's School of Medicine about the effectiveness of the portfolio as a way of assessing learning in the undergraduate medical program.

## Subjects & Methods

The current study is a cross-sectional study conducted at New Giza University's School of Medicine. The study included one hundred and sixteen (116) first-year and two hundred and ten (210) fifth-year medical students from the academic year 2021/2022.

**Study Tool:** A self-administered anonymous questionnaire validated by Ashcroft and Hall 2006 <sup>[11]</sup> was used. It is a 14 question/item questionnaire divided into three broad sections designed to elicit students' perceptions on the impact of the portfolio on their learning (Q1-7), their experience of building the portfolio (Q8-12), and their attitudes towards the use of portfolios to support continuous professional development CPD (Q13-14).

-Students were asked to rate their level of agreement with each statement. Responses were measured on a five-point Likert scale, with endpoints ranging from "strongly disagree" (1) to "strongly agree" (5) and scoring from 1 to 5. Higher scores indicate that students have greater perceptions of the portfolio. Negative items (Q7, Q10, Q12) were scored in reverse.

- An open-ended question was given to gather students' views and suggestions for the portfolio.

-Scoring system: The first section (students' perceptions on the impact of the portfolio on their learning) score will range from a minimum of 7 to a maximum of 35, the second section (students' perceptions on building the portfolio) score will range from 5 to 25, and the third section (students' perceptions on the use of portfolios in the CPD) score will range from 2 to 10.

- The questionnaire, written in English, was provided in printed form to first-year students at the end of the first module and after submitting their first portfolio requirements (at the academic advisory meeting), which was their first exposure to the portfolio. The questionnaire was given out in printed form to fifth-year students at the completion of the first module and after completing the portfolio requirements (at the academic advisory meeting).

**Ethical Considerations:** The ethical committee board approved the project (MS19/2022). Prior to completing the questionnaire, study participants provided informed consent. To ensure the confidentiality of the data, the questionnaire was made anonymous. The Dean of the School of Medicine at New Giza University granted his approval.

**Statistical Analysis:** The collected information was revised for accuracy and completeness before being coded and analyzed with IBM SPSS version 24. The data was statistically analyzed using the independent t-test. The significance level was set at a P-value of  $< 0.05$ .

## Results

### Students' perspectives of how the portfolio impacts their learning:

**Table (1)** shows the students' perceptions of how the prescription portfolio affected their learning.

Fifty-seven students (17.1%) thought that completing a portfolio was an excellent way to improve their knowledge. However, 171 students (52.4%) did not agree. 98 students (30.1%) went neutral.

Eighty-six students (26.4%) thought that the portfolio helped them recognize their strengths and weaknesses. 149 students (45.8%) disagreed. 91 students (27.9%) went neutral.

One hundred and fifteen students (35.3%) agreed that the portfolio helped them reflect and expand on their learning, while 111 students (34.1%) disagreed. 100 students (30.7%) went neutral.

Eighty-eight students (27%) felt that the portfolio provided insight into their approach to learning and that completing the portfolio changed their approach, whereas 145 students (44.5%) disagreed. 93 students (28.5%) were neutral.

Eighty-eight students (27.2%) agreed that the portfolio allowed them to modify their approach to studying, whereas 141 students (43.5%) disagreed. 95 students (29.3%) went neutral.

One hundred and sixty students (49.2%) felt that the portfolio is a useful means of recording personal feelings about learning, whereas 88 students (27.1%) disagreed. 77 students (23.7%) remained neutral.

One hundred and fifty-seven students (48.4%) thought the portfolio was an unstructured and unfocused style of learning, whereas 59 students (18.3%) disagreed. 108 students (33.3%) remained neutral.

### Students' Perceptions on Building the Portfolio:

**Table (2)** shows students' perceptions of portfolio development.

Seventy-six students (23.6%) felt that developing the portfolio was a beneficial learning experience, whereas 144 students (44.5%) disagreed. 103 students (31.9%) were neutral.

One hundred and twenty-two students (37.9%) thought that the portfolio gave them a sense of accomplishment, while 120 students (37.3%) disagreed. 80 students (24.8%) were neutral.

One hundred and thirteen students (37.3%) agreed that they would have liked to learn more about portfolio development, while 133 students (37.2%) disagreed. 94 students (29.4%) voted neutral.

One hundred and fourteen students (35.4%) felt that creating a portfolio helped them develop organizational skills, while 103 students (32%) disagreed. 105 students (32.6%) were neutral.

Two hundred and eighteen students (67.5%) felt that putting together the portfolio required too much paperwork, while 50 students (15.5%) disagreed. 55 students (17.0%) went neutral.

### Students' Perceptions on the Use of Portfolios in the CPD

**Table (3)** shows students' perceptions of the use of portfolios in CPD.

One hundred and thirty-seven students (42.5%) agreed that using a portfolio would be an effective way to document their continuing professional progress, whereas 87 students (27%) disagreed. 99 students (30.7%) were neutral.

Ninety-four students (29%) believed that a portfolio is an effective instrument for evaluating graduate clinical skills, while 140 students (43.2%) disagreed. 90 students (27.8%) stayed neutral.

### Results of the Open-Ended Question Regarding Suggestions for Improvements:

The majority of first-year students viewed the portfolio as time-consuming and suggested reducing activities and changing the requirements to focus on academic assignments more than expressing their feelings (reflection tasks).

The majority of fifth-year students indicated that there were several reflection assignments that they did not know whether or not related to their personal growth, and they requested additional clinical tasks. Some students recommended allowing them to write their reflections in Arabic so that they might be more detailed.

Some students requested that the portfolio submission timing be changed so that it was not linked to the exam entry.

### First and Fifth Year Students' Perceptions on the Impact of the Portfolio on their Learning Table (4):

Year one students had significantly higher mean scores ( $p$ -value  $< 0.05$ ) in five out of seven items: (questions 1 through 5)

Year 1 students scored considerably higher ( $p$ -value  $< 0.05$ ) than year 5 students on their overall perception of the portfolio's impact on learning.

### First & Fifth Year Students' Perceptions on Building the Portfolio Table (5):

Year one students had significantly higher mean scores ( $p < 0.05$ ) in three out of five items (questions 8, 9, 12).

Year one students scored considerably higher ( $p$ -value  $< 0.05$ ) than year 5 students on their overall perceptions of portfolio development.

First and fifth-year students' perceptions of the usage of portfolios in the CPD table (6).

Year one students reported a considerably higher mean score ( $p$  value  $< 0.05$ ) in the two items: (questions 13-14).

Year one students scored substantially higher ( $p < 0.05$ ) than year 5 students on their overall perceptions of using portfolios for CPD.

## Discussion

The rise of competency-based medical education may be one explanation for the widespread usage of portfolios as a learning and assessment tool in undergraduate medical education. Many health regulatory agencies have suggested that health professionals have the ability to reflect and learn how to reflect, in addition to the other abilities required of doctors<sup>[13]</sup>. In this study, when asked about the direct relationship between portfolio and increase in knowledge or learning skills, more than half of the students said that completing a portfolio was not a good way to develop their knowledge or identify their strengths and weaknesses, despite the fact that portfolios allowed them to reflect and build on their learning. One of the concerns made about the portfolio is that the expectations for its contribution to learning were not always clear to the student<sup>[14]</sup>.

Thus, it is essential to identify the portfolio's objectives for students. Jenkins et al., 2013<sup>[15]</sup> examined the factors that influence student acceptance and perception of the usage of portfolios, including the supply of clear objectives and rules for their use, as well as the presence of a well-defined portfolio structure. This could explain why first-year students reported a considerably higher mean score than fifth-year students, indicating that they have a more positive opinion of portfolio. This positive opinion could be attributed to their recent attendance at NGU's well-structured introductory program on portfolio use.

This program includes lectures given to students at the beginning of the year regarding the portfolio, its objectives, importance, how to build it, its requirements, and how the process will work. Good mentorship may also contribute to students' positive perceptions. The program also includes the development of mentors to help and guide students, as well as frequent academic advising meetings in which mentors give students comments on their portfolios and how to improve them.

First-year students may be more enthusiastic about the new idea of portfolio as a new method of learning at the start of their medical

school. This is consistent with Duque et al., 2006<sup>[16]</sup>, who stated that good introduction of the portfolio goal and process can improve student perception and satisfaction with the portfolio. Although fifth-year students have taken the same introductory course to portfolio preparation and completed the same educational process as first-year students, it is possible that the fifth-year students have a higher educational load than first-year students.

According to Meeus et al. (2006)<sup>[17]</sup>, a portfolio is an effective tool for supervising and assessing learning abilities, as well as providing excellent tracking and adjustment capabilities for the student's learning process. There have been studies undertaken to determine how, when, and to what extent students value the use of portfolios in medical education. According to a study carried out at the University of Dundee in Scotland, students' attitudes towards portfolios improved over the course of the five-year study, and they became better able to understand how portfolios help students improve their comprehension skills and allow them to reflect on and self-evaluate their work<sup>[18]</sup>. In the current study, the majority of students did not agree that the portfolio could help them identify or improve their learning style, despite the fact that they thought that the portfolio was useful for documenting their feelings and reflections on learning. This is consistent with Van Schaik et al. (2013)<sup>[19]</sup>, who noted that students are unaware of how portfolios might be integrated into their education.

Mentorship is essential for enhancing portfolio acceptance. According to Driessen et al., 2005<sup>[20]</sup>, a lack of acceptance is a key issue because portfolios require a supporting framework (mentorship, a learning environment that promotes learning, and a meaningful learning experience for the learner). Désilets et al., 2022<sup>[21]</sup> stated that there is a negative perception of portfolios and their significance in education, and neither students nor mentors value the portfolio. They said that students' opinions indicate that they did not find the portfolio to be very user-friendly, and mentors' comments

support this view. Dekker et al., 2009<sup>[22]</sup> found that using a portfolio in conjunction with a mentor encourages and facilitates looking back and commenting on the material obtained, which appears to be beneficial to learning and professional development. In the current study, despite the presence of a supporting framework and well-trained mentors, some students did not accept the concept of portfolios and did not see them as a tool for identifying their learning skills and self-assessment.

In this study, when asked about reflection tasks, over half of the students thought that a portfolio is a valuable way to document personal feelings about learning. Writing portfolio reports can help students develop the ability to constructively criticize themselves, allowing them to better direct their future progress<sup>[23]</sup>. Dannefer et al., 2012<sup>[24]</sup> stated that a portfolio is more than just a collection of data; it also displays how the student's reflection on these resources demonstrates learning. Some students struggled to see the connection between writing reflections and improving the learning process. Austin et al., 2005<sup>[25]</sup> also stated that learners already considered themselves as reflective practitioners, and the obligation to reflect in a portfolio delayed their own professional development, and time is also an important concern. Ahmed 2018<sup>[26]</sup> attributed the lack of interest in reflection to a variety of factors, including its time-consuming nature. He asserted that reflection was not taught at the undergraduate level (no handouts explaining what reflection is, its benefits, and usefulness in lifelong learning). Furthermore, in busy university hospitals, many educational supervisors will struggle to read what is written in reflection.

In this study, the majority of students agreed that completing the portfolio requirement is time-consuming, particularly fifth-year students. According to Dekker et al., 2009<sup>[22]</sup>, time consumption can be a big issue for medical students, particularly first-year students, resulting in a lack of time for reflection, self-assessment, and identification

or modification of their learning style. One of the reasons for the negative view of portfolios, which has hampered their widespread use, is that they are time-consuming, so students do not have enough time to maintain track of their records, especially when they include reflection<sup>[4]</sup>. This is consistent with our findings, as portfolio management adds to a student's already demanding workload, particularly among fifth-year students who requested that reflective assignments be reduced.

The majority of students were unable to connect the portfolio to their learning process and agreed that the portfolio was a woolly type of learning. However, Meeus et al., 2006<sup>[17]</sup> emphasized that the primary goal of portfolios focused on skill acquisition is to promote self-directed learning. They went on to say that portfolios are more beneficial for supervising and assessing learning abilities competences than portfolios that focus on profession-specific skills.

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In this study, over half of the students disagreed that developing a portfolio was an useful learning experience, although agreeing that it helped them improve organizational abilities. Some students (mostly first-years) expressed an interest in learning more about portfolio development. According to Williamson (2011) <sup>[27]</sup>, medical students without prior portfolio experience are concerned about the procedure and regard it as an additional load on an already challenging first year of practice. To gain an advantage, he proposed that students should start developing their portfolio-building and reflective practice skills early on.

First-year students reported a much higher mean score than fifth-year students when it came to developing the portfolio; this could be attributed to the fact that fifth-year students have a heavier educational load. Joshi et al., 2015 <sup>[6]</sup> explained the negative perception of portfolios, stating that both students and teachers do not understand the purpose of the portfolio. They proposed that these perceived weaknesses can be remedied by providing tutors and students with portfolio training and sensitization, keeping the portfolio concise, and maintaining a flexible, learner-centered, and user-friendly portfolio format.

In this study, first-year students indicated a significantly higher level of agreement than fifth-year students that having a portfolio is a smart way to demonstrate their professional development. This is consistent with Hargreaves, 2016 <sup>[28]</sup>, who reported that the ability of learners to use their metacognitive skills to the best advantage for their own continuous development, professional identity, and humane understanding of patients is a significant benefit of further

developing each learner's metacognitive skills and encouraging them to understand their own metacognitive process.

In the current study, the majority of the students did not consent to use the portfolio to assess their competencies. According to Meeus et al., 2006 <sup>[17]</sup>, using a portfolio to assess both professional and learning abilities by the same assessor is generally discouraged because it undermines the credibility of the results. They also stated that portfolios aimed at profession-specific competences in higher education provide little additional value when compared to other, and often better, methods. These strategies are currently more effective tools for helping and evaluating a student's learning ability. They also stated that a portfolio based on learning competencies can provide real value, and hence the introduction of such a portfolio is the recommended solution if we want our graduates to be not only professionally competent, but also capable of continuing to study for the rest of their lives. One of the disadvantages of utilizing a portfolio to monitor professional development is that workplace-based education has a high load, and collecting workplace-based feedback and assessment for the portfolio, as well as reflecting, can be difficult <sup>[29]</sup>.

Although data suggests that portfolios can be used in a number of situations, questions remain about their structure, kind, consistency, acceptance, use, time constraints, and educational benefits <sup>[30]</sup>. The problem is dispelling the widespread belief that portfolios are subjective and non-standardized, making them inappropriate for assessment, particularly in high-stakes exams <sup>[31]</sup>. However, it is now commonly recognized that portfolio qualitative data may be efficiently analyzed using holistic evaluation approaches. When exposed to good qualitative examination, the portfolio achieves suitable inter-rater reliability, eliminating the issue of subjective portfolio <sup>[32]</sup>. Another concern is incorrect or incomplete information; when a student realizes that the information in his portfolio will be used for evaluation, he may be hesitant

to point out his flaws or offer misleading information <sup>[33]</sup>.

It may also be difficult to tell whether the content of the portfolio, particularly the reflection, is the individual's own work. <sup>[6]</sup>. Concerns have been raised that the content necessary for inclusion in learning portfolios may not always be acceptable <sup>[30]</sup>. High inter-rater reliability due to inconsistency in portfolio structure and assessor training. Although the research suggests that portfolio-based learning has a positive educational impact, the results have been variable <sup>[34]</sup>. Despite evidence of their effectiveness, portfolios have yet to gain widespread acceptance <sup>[13]</sup>.

Even with the current data, portfolios are underused for learning and evaluation. This could be due in part to a lack of awareness of the tool's existence or perceived educational benefits <sup>[6]</sup>. This can be addressed by rigorous preparation when designing portfolios, establishing learning outcomes, and organizing the portfolio such that enough data can be acquired to assess whether or not necessary learning occurred <sup>[35]</sup>. Medical Education Units play an important role in creating knowledge about this instrument among instructors and students. The next stage would be to gain organizational and administrative support in order to accomplish and maintain it <sup>[6]</sup>.

## Conclusion

Students are unaware of the significance of portfolios and its relevance to their learning. They reported that portfolios are not an effective method of learning, teaching, or assessment. They did, however, believe that having an organized portfolio helped them improve their organizational abilities and documentation's ability to offer a comprehensive view of the full extent of the professional competencies required for clinical specialization. Concerns were raised about the time spent preparing for the portfolio requirement, as well as the relationship between the reflection task and the learning process.

## Recommendations

For a more positive portfolio perception, we support good introduction and mentoring, clear identification of portfolio objectives and integration within context and procedures, proper mentor training, and making it user-friendly by limiting time demands and providing more clear tasks.

## References

1. Costa, G. D. D., Driessen, E., Silva, L. S. D., Campos, A. A. D. O., Costa, T. D. M. T. D., Donateli, C. P., & Cotta, R. M. M. (2018). Collective portfolio: assessment of teaching and learning in health undergraduate courses. *Ciência & Saúde Coletiva*, *23*, 3779-3787. <https://doi.org/10.1590/1413-812320182311.27072015>
2. Wilkerson, J. R., & Lang, W. S. (2003). Portfolios, the Pied Piper of teacher certification assessments: Legal and psychometric issues. *Education Policy Analysis Archives*, *11*, 45-45.
3. Zubizarreta, J. (2009). *The learning portfolio: Reflective practice for improving student learning*. John Wiley & Sons.
4. Gallagher, P. (2001). An evaluation of a standards based portfolio (This article was originally published in an incomplete form in: *Nurse Education Today* (2001) 21 (3): 197-200. The Publishers would like to apologize for this error). *Nurse Education Today*, *21*(5), 409-416.
5. Joshi, M. K., Gupta, P., & Singh, T. (2015). Portfolio-based learning and assessment. *Indian pediatrics*, *52*(3), 231-235.
6. Koole, S., Dornan, T., Aper, L., Scherpbier, A., Valcke, M., Cohen-Schotanus, J., & Derese, A. (2012). Does reflection have an effect upon case-solving abilities of undergraduate medical students?. *BMC medical education*, *12*(1), 1-5.
7. Sobral, D. T. (2001). Medical students' reflection in learning in relation to approaches to study and academic achievement. *Medical teacher*, *23*(5), 508-513.
8. Hall, P., Byszewski, A., Sutherland, S., & Stodel, E. J. (2012). Developing a sustainable electronic portfolio (ePortfolio) program that fosters reflective practice and incorporates CanMEDS competencies into the undergraduate medical curriculum. *Academic Medicine*, *87*(6), 744-751.
9. Bolliger, D. U., & Shepherd, C. E. (2010). Student perceptions of ePortfolio integration in online courses. *Distance Education*, *31*(3), 295-314.
10. Friedman Ben David, M. (2000) The role of assessment in expanding professional horizons, *Medical Teacher*, *22*(5).
11. Ashcroft, D. M., & Hall, J. (2006). Pharmacy students' attitudes and views about portfolio-based learning: A questionnaire survey. *Pharmacy Education*, *6*(1).
12. Driessen EW, Muijtjens AM, Van Tartwijk J, Van der Vleuten CP. (2007). Web- or paper-based portfolios: is there a difference? *Med Educ*. *41*(11):1067-73.
13. Marambe KN. (2015). Portfolio: an innovative teaching, learning and assessment tool in medical training. *Sl J Med*. *24*:25-29
14. Jenkins L, Mash B, Derese A. (2013). The national portfolio for postgraduate family medicine training in South Africa: a descriptive study of acceptability, educational impact, and usefulness for assessment. *BMC Med Educ*. *13*:101.
15. Duque G, Finkelstein A, Roberts A, Tabatabai D, Gold SL, Winer LR. (2006). Learning while evaluating: the use of an electronic evaluation portfolio in a geriatric medicine clerkship. *BMC Med Educ* *6*: 4.
16. Meeus, W., Van Petegem, P., & Van Looy, L. (2006). Portfolio in higher education: Time for a clarificatory framework. *International Journal of Teaching and Learning in Higher Education*, *17*(2), 127-135.
17. Davis MH, Ponnampereuma GG, Ker JS. (2009). Student perceptions of a portfolio assessment process. *Med Educ*. *43*:89-98.

18. Van Schaik S, Plant J, O'Sullivan P. (2013). Promoting self-directed learning through portfolios in undergraduate medical education: the mentors' perspective. *Med Teach.* 35(2):139-144.
19. Driessen, E. W., Van Tartwijk, J., Overeem, K., Vermunt, J. D., & Van Der Vleuten, C. P. (2005). Conditions for successful reflective use of portfolios in undergraduate medical education. *Medical education*, 39(12), 1230-1235.
20. Désilets V, Graillon A, Ouellet K, Xhignesse M, St-Onge C. (2022). Reflecting on professional identity in undergraduate medical education: implementation of a novel longitudinal course. *Perspect Med Educ.* 11(4):232-236. doi: 10.1007/s40037-021-00649-w.
21. Dekker, H., Driessen, E., Braak, E. T., Scheele, F., Slaets, J., Van Der Molen, T., & Cohen-Schotanus, J. (2009). Mentoring portfolio use in undergraduate and postgraduate medical education. *Medical Teacher*, 31(10), 903-909.
22. Gadbury-Amyot CC, Bray KK, Austin KJ. (2014). Fifteen years of portfolio assessment of dental hygiene student competency: lessons learned. *Int J Dent Hyg.* 88:267-274.
23. Dannefer, E. F., Bierer, S. B., & Gladding, S. P. (2012). Evidence within a portfolio-based assessment program: what do medical students select to document their performance? *Medical teacher*, 34(3), 215-220.
24. Austin, Z., Marini, A., & Desroches, B. (2005). Use of a learning portfolio for continuous professional development: A study of pharmacists in Ontario (Canada). *Pharmacy Education*, 5(3).
25. Ahmed MH. (2018). Reflection for the undergraduate on writing in the portfolio: where are we now and where are we going? *J Adv Med Educ Prof.* 6(3):97-101. PMID: 30013993; PMCID: PMC6039822
26. Williamson A. (2011). Building a portfolio *BMJ.* 343 :d4942 doi:10.1136/sbmj.d4942
27. Hargreaves, K. (2016). Reflection in Medical Education, *Journal of University Teaching & Learning Practice*, 13(2). Available at: <http://ro.uow.edu.au/jutlp/vol13/iss2/6>
28. Hrisos, S., Illing, J. C., & Burford, B. C. (2008). Portfolio learning for foundation doctors: early feedback on its use in the clinical workplace. *Medical education*, 42(2), 214-223.
29. Tochel, C., Haig, A., Hesketh, A., Cadzow, A., Beggs, K., Colthart, I., & Peacock, H. (2009). The effectiveness of portfolios for post-graduate assessment and education: BEME Guide No 12. *Medical teacher*, 31(4), 299-318.
30. Roberts C, Newble D, O'Rourke AJ. (2002). Portfolio-based assessments in medical education: Are they valid and reliable for summative purposes? *Med Educ* 36:899-900.
31. Colbert, C. Y., Ownby, A. R., & Butler, P. M. (2008). A review of portfolio use in residency programs and considerations before implementation. *Teaching and Learning in Medicine*, 20(4), 340-345.
32. Davis MH, Ponnampertuma GG. (2005). Portfolio assessment. *J Vet Med Educ.* 32:279
33. Hall D. (1992). Professional development portfolios for teachers and lecturers. *Br J Service Educ.* 18:81-6.
34. Donato, A. A., & George, D. L. (2012). A blueprint for implementation of a structured portfolio in an internal medicine residency. *Academic Medicine*, 87(2), 185-191.

## List of Tables:

**Table (1) Students' Perceptions on the Impact of the Portfolio on Their Learning**

Question	Strongly disagree n (%)	disagree n (%)	Neutral n (%)	Agree n (%)	Strongly agree n (%)	Total
1.A portfolio is a good method of developing my knowledge	93 (28.5)	78 (23.9)	98 (30.1)	41(12.6)	16(4.5)	326
2. The portfolio allowed me to identify my strengths and weaknesses	67 (20.6)	82 (25.2)	91(27.9)	71(21.8)	15(4.6)	326
3.The portfolio allowed me to reflect and build on my learning from other modules	52(16.0)	59(18.1)	100(30.7)	88(27.0)	27(8.3)	326
4.I have gained further insight into my approach to learning by completing the portfolio	58(17.8)	87(26.7)	93(28.5)	73(22.4)	15(4.6)	326
5. I can see some opportunities to modify my approach to learning as a result of completing the portfolio	63(19.4)	78(24.1)	95(29.3)	69(21.3)	19(5.9)	324
6. The portfolio provides useful means of documenting personal feelings about my learning	42(12.9)	46(14.2)	77(23.7)	119(36.6)	41(12.6)	325
7. I find this form of learning undirected	18(5.6)	41(12.7)	108(33.3)	94(29.0)	63(19.4)	324

**Table (2) Students' Perceptions on Building the Portfolio:**

Question	Strongly disagree n (%)	disagree n (%)	Neutral n (%)	Agree n (%)	Strongly agree n (%)	Total
8.Building the portfolio was a useful learning experience	56(17.3)	88(27.2)	103(31.9)	58(18.0)	18(5.6)	323
9-Building the portfolio gave me a sense of achievement	54(16.8)	66(20.5)	80(24.8)	78(24.2)	44(13.7)	322
10-I would have liked more information about building the portfolio	47(14.7)	66(20.6)	94(29.4)	70(21.9)	43(13.4)	320
11-Building the portfolio helped me to develop my organizational skills	41(12.7)	62(19.3)	105(32.6)	85(26.4)	29(9.0)	322
12-Buliding the portfolio involved completing too much paperwork	18(5.6)	32(9.9)	55(17.0)	102(31.6)	116(35.9)	323

**Table (3): Students' Perceptions on the Use of Portfolios in the CPD**

Question	Strongly disagree n (%)	disagree n (%)	Neutral n (%)	Agree n (%)	Strongly n agree (%)	Total
13.Using a portfolio would be a good means of documenting my continuing professional development	37(11.5)	50(15.5)	99(30.7)	100(31.0)	37(11.5)	323
14.The use of a portfolio is a good tool for judging on graduate clinical competences	69(21.3)	71(21.9)	90(27.8)	68(21.0)	26(8.0)	324

**Table (4) First- & Fifth-year Students' Perceptions on the Impact of the Portfolio on their Learning**

	Year	Mean ( $\pm$ SD)	P value*
1-A portfolio is good method of developing my knowledge	1.0	2.7(1.3)	.002*
	5.0	2.2 (1.1)	
2-The Portfolio allowed me to identify my strength and weaknesses	1.0	3.0 (1.2)	.000*
	5.0	2.4(1.1)	
3-The Portfolio allowed me to reflect and build on my learning from other modules	1.0	3.1(1.2)	.047*
	5.0	2.8(1.2)	
4-I have gained further insight into my approach to learning by completing	1.0	3.0(1.1)	.000*
	5.0	2.5(1.1)	
5-I can see some opportunities to modify my approach to learning as a result of completing the portfolio	1.0	2.9(1.2)	0.009*
	5.0	2.5(1.2)	
6-The portfolio provided a useful means of documenting personal feelings about my learning	1.0	3.2(1.2)	0.85
	5.0	3.2(1.2)	
7-I find this form of learning too wooly and undirected	1.0	2.6(1.2)	0.26
	5.0	2.5(1.0)	
Total score	1.0	21.3 (5.3)	0.02*
	5.0	19.3 (5.5)	

\*Independent t test

**Table (5) First- & Fifth-Year Students' Perceptions on Building the Portfolio**

	Year	Mean( $\pm$ SD)	P value*
8-Building the portfolio was a useful learning experience	1.0	2.86 (1.14)	
	5.0	2.56 (1.10)	0.02*
9-Building the portfolio gave me a sense of achievement	1.0	3.20 (1.30)	0.02*
	5.0	2.85 (1.27)	
10-I would have liked more information about building the portfolio	1.0	3.13 (1.27)	0.103
	5.0	2.9 (1.22)	
11-Building the portfolio helped me to develop my organizational skills	1.0	3.13 (1.18)	0.126
	5.0	2.92 (1.13)	
12-Building the portfolio involved completing too much paperwork	1.0	4.14 (1.01)	
	5.0	3.64 (1.23)	0.000*
Total score	1.0	16.47(3.70)	0.000*
	5.0	14.91(3.78)	

\*Independent t test

**Table (6) First- & Fifth-Year Students' Perceptions on the Use of Portfolios in the Continuous Professional Development CPD**

	Year	Mean( $\pm$ SD)	P value*
13-Using a portfolio would be a good means of documenting my continuing professional development	1.0	3.27 (1.30)	
	5.0	3.00 (1.07)	0.21*
14-The use of a portfolio is a good tool for judging on graduate clinical competences	1.0	3.02 (1.24)	
	5.0	2.56(1.20)	0.001*
Total score	1.0	6.2957 (2.32)	0.01*
	5.0	5.64 (2.01)	

\*Independent t test