

Doi: 10.21608/JHPEL.2024.251191.1005

ORIGINAL ARTICLE

Open Access

Using REFLECT Rubric for Assessing the Reflective Use of E-Portfolios, a Qualitative Pilot Study at Alexandria Faculty of Medicine

Marwa Schumann¹, Azza Baraka²

¹ Medical Education Department, Faculty of Medicine, Alexandria University, Alexandria, Egypt

² Clinical Pharmacology Department, Faculty of Medicine, Alexandria University, Alexandria, Egypt

Abstract

Background

Reflective practice, essential to the development of critical thinking and professionalism in medical education, is increasingly facilitated by portfolios in both undergraduate and postgraduate contexts. With the aim of enhancing the reflective skills of undergraduate medical students, an e-portfolio was piloted and evaluated at the Alexandria Faculty of Medicine.

Methods

After attending the two-week elective course "Steps towards accreditation of medical schools", 5th and 6th year medical students submitted their e-portfolios containing reflections on their role in quality management and accreditation, their strengths, and weaknesses in soft skills in the academic years 2021/2022 and 2022/2023.

This qualitative study was conducted to evaluate the piloting of the e-portfolio by analysing students' reflective comments using the Reflection Evaluation For Learner's Enhanced Competencies (REFLECT) rubric using the qualitative software data analysis program ATLAS.ti.

Results

A total number of 177 final year medical students participated in the elective course and submitted their e-portfolios as a requirement to pass the course. Analysis has showed that most of the reflective comments remained in the two lower levels of the REFLECT rubric, most of the comments were superficial, descriptive, non-reflective (factual reporting) rather than reflective, critical, or introspective.

Conclusions

E-portfolios provide a structured and adaptable platform that facilitates reflective thinking, an important metacognitive skill in medical education. In order to make undergraduate medical students reflective, more emphasis should be placed on training them in reflective writing. Our findings suggest that the integration of the REFLECT rubric can provide a comprehensive framework for assessing e-portfolios

Keywords: soft skills, e portfolio, REFLECT rubric, qualitative research.

Received: 25-11-2023 Accepted: 13-02-2024

Published Online: April 2024

How to cite this article

Schumann, M., & Baraka, A. "Using REFLECT Rubric for Assessing the Reflective Use of E-Portfolios, a Qualitative Pilot Study at Alexandria Faculty of Medicine." J Health Prof Edu Innov, Vol. 1, no. 2, April 2024, pp 21-35.
Doi: 10.21608/JHPEL.2024.251191.1005

Correspondence Address

Dr. Marwa Schumann
Lecturer of Medical Education
Faculty of Medicine, Alexandria University, Alexandria, Egypt
Azarita, El Soutan Hussein St., Alexandria, Egypt
marwa.schumann@charite.de
Telephone: +20 1223440483



Background

Over the past few decades, there has been a remarkable transformation in the field of medical education, characterised by a shift in curricular emphasis from the acquisition of knowledge to the attainment of competencies (1). Competency-based medical education and competency frameworks, e.g. CanMeds, aim to equip physicians with the skills they need to meet a range of challenges, including dealing effectively with increasingly knowledgeable and assertive patients, integrating new knowledge and evidence into their daily clinical practice, and working with an increasing number of healthcare professionals in larger teams and communities (2). To navigate these complexities effectively, physicians need not only the 'hard clinical skills', but also generic competencies, often referred to as 'soft skills', which enhance their communication, organisational, leadership and conflict management skills. Recently, there has been a growing interest in the learning, teaching and assessment of soft skills, particularly as the COVID-19 pandemic has required physicians to make daily decisions that require knowledge and skills beyond their biomedical training (3, 4). In addition to their medical expertise, physicians are now expected to be reflective administrators, leaders, and managers. These skills, once considered optional, have become as integral to the role of a physician as the importance of internal medicine and surgery (4). While soft skills training has been limited to select groups of physicians, the pandemic has highlighted the need for all health professionals to develop these skills and receive training to improve interpersonal skills, communication, and conflict resolution. There is a gap in the literature as how this training should be seamlessly integrated into the established medical curriculum and delivered by faculty members with significant expertise (4).

Facilitating the development of soft skills, including communication, leadership and management skills in trainees, can be effectively achieved by promoting reflective skills in medical education (5). Reflection is a metacognitive skill that involves the deliberate contemplation of one's performance, either before, during or after specific situations, in order to identify and describe the underlying mental models that influence the decisions and actions that affect the outcome of that performance (6, 7). Being a skill-enhancing process, reflection draws on personal experience to inform practice and plays a central role in the core competencies of professional practice (8).

Enhancing reflective capacity is emphasised as a critical component for the effective use of feedback in medical education and is an integral part of self-regulated and lifelong learning (9). In the field of medical education, there is a significant body of research focused on improving the teaching and assessment of reflective writing, particularly in the context of undergraduate medical education programs, which highlights the importance of medical students developing reflective skills throughout their educational journey (10).

This has led to a wider use of portfolios in undergraduate medical education, continuing professional development and, more recently, in the postgraduate revalidation process (1). The use of student portfolios as teaching and assessment method promotes a learning-centred approach for both students and teachers. In this approach, assessment goes beyond simply measuring and reinforcing desired learning outcomes; it also cultivates key attributes, skills, attitudes, and cognitive processes necessary for lifelong learning. Consequently, the use of portfolios not only broadens the horizons of assessment but also provides a number of valuable pedagogical benefits (11). Portfolios make a valuable contribution to assessment in a number of ways, for example by assessing a wide range of learning outcomes that are often difficult to assess using other methods, such as personal development, self-directed learning, reflective skills, self-assessment of personal development, professionalism and more (12). Portfolios also allow the collection of evidence from different sources, such as a student's ongoing work over time, in different contexts and across different subjects, providing a comprehensive view of a student's development over time, as opposed to the snapshot approach of traditional assessment methods (13).

Through the use of chronological work samples collected at different times, portfolios make it possible to assess a student's progress towards achieving learning outcomes and serve the dual purpose of providing summative statements for promotion or pass/fail decisions, while also providing a detailed profile of a student's abilities. These summative assessments can include insights into a student's strengths and weaknesses, thereby integrating summative decisions with formative feedback (14).

By using e-portfolios to document their reflective written commentary, capturing their journey of self-assessment, and learning experiences over time, students can record their thoughts, insights, professional



development and personal growth (15). Not only do students improve their reflective skills, but they also have a convenient and organised way to document their progress, making it easier for educators to assess their growth as reflective practitioners. This digital approach offers several advantages, such as easy access and a comprehensive view of a student's reflective development (16). The use of e-portfolios in conjunction with reflective writing exercises further supports the nurturing of reflective habits and ultimately assists in the assessment of students' competence as reflective practitioners in medical education (7).

Several studies have aimed to develop tools to support the assessment of reflective writing, a notable example being the Reflection Evaluation for Learners' Enhanced Competencies Tool (REFLECT)(17). REFLECT introduces a matrix that assesses written reflections on the basis of five key characteristics. These assessments are made on a 4-level scale, ranging from 'non-reflective' to 'critically reflective'. It also makes it possible to identify whether the critical level of reflection represents confirmatory or transformative learning (7). Applying the REFLECT rubric to a reflective comment involves a systematic four-step process. First, the entire comment is read to gain an overall understanding. The next step, fragmentation, involves a closer examination of specific details, such as phrases or sentences, to assess the presence and quality of each criterion of the rubric and assign appropriate levels to each criterion. Following this detailed analysis, the process moves to the Gestalt stage, where the evaluator zooms out to consider the overall impression of the comment. Finally, the assignment of levels and learning outcomes is defended with examples from the text, emphasising the importance of not making assumptions or 'reading between the lines' (9). In essence, this tool serves a dual purpose: to standardise the assessment of medical trainees' reflective skills by evaluating their written reflections, and to assist faculty assessors in providing meaningful feedback.

The undergraduate soft skills e portfolio project

In Egypt the National Authority for Quality Assurance and Accreditation in Education (NAQAAE) was established in 2006 to assure the quality, continuous improvement, and efficient performance of Egyptian education institutions in general and medical schools in particular. In 2008, the NAQAAE developed a set of National Academic Reference Standards for the bachelor's degree in medicine (NARS) to ensure that all medical graduates achieve the skills and competencies needed to practice medicine. In 2017, NAQAAE issued the second version of the competency framework NARS to ensure a well-integrated curriculum with early clinical exposure (18-20).

In line with the global trend to ensure quality in medical education and in response to the higher education reform strategy in Egypt, driven by the recommendations of the National Conference on Higher Education and guided by the (NARS) for medical education programmes, the Quality Assurance Unit collaborated with the Medical Education Department at the Alexandria Faculty of Medicine to design and implement an elective course for final year undergraduate medical students (18). The e-portfolio for the elective course "Steps towards Accreditation of Medical Schools" has been designed as a comprehensive and cost-effective tool to facilitate student learning, reflection, and self-assessment in line with specific course lectures and topics. Within each section, students have access to self-administered questionnaires tailored to the specific topics: leadership style, communication skills and conflict management style. Students complete these questionnaires which allow them to self-assess their competencies in these areas. The questionnaires are designed to help students objectively assess their strengths and weaknesses.

The portfolio is organised into different sections, each corresponding to the key topics and lectures covered in the course which are aligned with the undergraduate medical education program and the six competency domains of the NARS.

In this first section of the e-portfolio, students can articulate their course expectations and outline their course plan, which is not only a valuable exercise in self-reflection, but also a crucial step towards achieving their educational goals. By starting their e-portfolio with this general section, students establish a strong foundation for their course experience and foster a sense of ownership, direction, and responsibility for their learning journey. It also provides a valuable reference point for self-assessment and progress tracking as the course progresses.

In alignment with the NARS and the undergraduate medical education program specifications and the elective course specifications, the e portfolio is divided into different sections, as described in the methods section.

After completing the self-assessment questionnaires in each section, students engage in reflective practice. Through reflective comments, they interpret their questionnaire results and identify areas of strength and areas for improvement. This reflective process encourages critical thinking about their competencies and areas for development.

The final part of the e-portfolio is the action plan. This is where students create a short plan based on their self-assessment results and insights. They outline specific steps they intend to take to further develop their skills.



These steps might include setting goals, seeking mentorship, or participating in additional training or practice.

The e-portfolio is designed as a user-friendly Word document that students can conveniently download, complete and return by email as part of their course requirements. Due to resource constraints, we have chosen not to use online platforms or specialised software for the pilot implementation of this e-portfolio. This choice is in keeping with the course's focus on resource-efficient, low-cost tools, while still facilitating a comprehensive approach to student learning, reflection, and self-assessment in line with specific course lectures and topics. By using a downloadable Word document for the e-portfolio, we have made it accessible to students without the need for additional online tools or platforms. This approach allows for a seamless integration of reflection and self-assessment into the course curriculum, while respecting resource limitations. The e-portfolio continues to serve as a dynamic and effective tool to support the development of students' skills and competences in an accessible and practical way.

This study seeks to evaluate the effectiveness of the pilot reflective implementation of the e-portfolio, using the REFLECT rubric as an evaluation framework. In pursuit of this aim, the research question seeks to explore the nature and depth of reflective writing demonstrated by final year medical students participating in the elective. Investigating the nature and depth of their reflective writing will contribute to a broader understanding of the potential impact of e-portfolios in enhancing reflective skills within the context of medical education.

Methods

Study setting and participants

This study involved final year medical students attending a two-week elective online course entitled 'Steps towards Accreditation of Medical Schools'. The course aimed to equip students with knowledge and skills related to quality management and accreditation as well as soft skills of management and leadership, communication skills and conflict management. The study was conducted between December 2021 and April 2023 during the academic years 2021/2022 and 2022/2023 at the Alexandria Faculty of Medicine. Two consecutive cohorts of 5th and 6th year medical students were included in the study.

Study design

After completing the elective course, participating students were required to submit e-portfolios containing reflections on various aspects. These reflections

included their perceptions of their role in quality management and accreditation, self-assessment of their strengths and weaknesses in communication, leadership, and conflict management.

We approached this descriptive qualitative study from a constructivist perspective and analysed the reflective comments provided by the students in the free text section of their e-portfolios. We used purposeful maximum variation sampling including (117) e-portfolios from different cohorts across two academic years (21). We also sought variation in demographic factors such as age and gender to ensure a broad representation of perspectives within the study population. This approach is consistent with the study's aim of capturing a wide range of experiences and perspectives, thereby contributing to the rigour and validity of the research findings.

Data collection

The e-portfolio is divided into the following sections:

1. Role of medical students in accreditation

In this section, students document their understanding of the role of medical students in the accreditation process. They may include reflections, insights and any relevant materials that demonstrate their understanding of this critical aspect of medical education. They also reflect on the value of the NARS in shaping their learning experience.

2. Communication skills

This section focuses on the development of students' communication skills. Here students describe their experiences, challenges, and progress in developing their communication skills as discussed in the course lectures. After completing the Self-Assessment Communication Survey students write reflective comments about their perceived strengths and weaknesses and their action plan (22).

3. Leadership Skills

The Leadership Skills section encourages students differentiate between management and leadership and reflect on their leadership skills that have been discussed throughout the course. They are asked to reflect on good and bad leaders they have met in their lives and to complete the leadership style quiz (23). After that they are asked to reflect on the quiz results in terms of their strengths and weaknesses and their action plan.

4. Conflict Management Skills

In this part of the e-portfolio, students explore their understanding and application of conflict management skills, a key theme of the course. Students can share



their experiences of dealing with conflict, their approaches and any lessons learnt from the course content. They complete the Conflict Management Styles Quiz (24) and write reflective comments on the results of the quiz in terms of their strengths and weaknesses and their action plan.

The REFLECT tool

The Reflection Evaluation for Learners' Enhanced Competencies Tool (REFLECT) is the culmination of rigorous development and provides a robust framework for assessing learners' reflective capacities (25). This rubric includes four distinct levels of reflective capacity, ranging from habitual action to critical reflection, each delineated by focused criteria. In addition to assessing reflective writing (RW), the REFLECT rubric extends its assessment to include transformative reflection and learning, as well as affirmative learning.

The REFLECT has emerged as a carefully crafted and theoretically informed analytical rubric. Its demonstrated adequacy in terms of interrater reliability, face validity, feasibility and acceptability underscore its utility in assessing reflective capacity. Beyond mere assessment, the REFLECT rubric serves as an innovative tool to promote the development of reflective clinicians through formative assessment. In addition, it facilitates the improvement of faculty feedback and contributes to a nuanced understanding and refinement of reflective comments(26).

Data Analysis

The reflective comments from the e-portfolios were subjected to qualitative analysis using the Reflection Evaluation for Learner's Enhanced Competencies (REFLECT) rubric as a pre-defined framework for identifying themes and patterns within the data. The REFLECT tool was developed to assess the reflective capacity of students according to four reflective capacity levels: habitual action, thoughtful action, reflection, and critical reflection.

The analysis process included the following four essential steps (9):

i. Comprehensive reading:

We began the analysis with a thorough reading of all the reflective comments in the e-portfolio to ensure a comprehensive understanding of their content.

ii. Fragmentation:

In this step we conducted a detailed examination, zooming in to analyse phrases and sentences within the reflective comments. We systematically assessed the

presence and quality of each criterion, and identified the specific level at which each criterion was met.

iii. Gestalt:

Following the detailed analysis in step 2, we zoomed out to evaluate the overall gestalt of the reflective comments, with the aim of determining the overall level achieved by the narrative.

iv. Defending the assignments:

To reinforce the rigour of our analysis, we supported the assigned level with concrete examples of reflective comments taken directly from the e-portfolios. We maintained a rigorous approach, avoiding assumptions or interpretations beyond the explicit examples presented in the reflective comments. Our focus remained on the clarity and transparency of the examples provided.

The ATLAS.ti (a computerized indexing system, GmbH, Berlin, Germany) was employed for analysis. In a collaborative analysis process, the first assessor and principal researcher (MS) produced the initial analysis based on the first cohort of e-portfolios. The second assessor and author AB revised the analysis and a consensus process followed. Discrepancies in the collaborative analysis process were addressed through a structured approach. After the initial analysis by the first assessor (MS), the second assessor (AB) revised the findings, leading to a consensus-building process between the assessors. Any differences in interpretation or assessment were resolved through in-depth discussion, ensuring agreement on the assigned levels of reflection. Finally, analysis of the remaining e-portfolios was continued in the same way by MS and AB.

Reflexivity

Reflexivity was achieved by keeping a research diary, which included notes and comments on the relationship and interaction between the researchers and the participants (27). In this case, the investigators act as insiders, taking on the role of course leaders for the 'Steps towards Accreditation of Medical Schools'. They took responsibility for teaching all the participants and providing ongoing support throughout the course. While this positioning facilitated a deeper understanding of the contextual nuances, potential drawbacks emerged, primarily in terms of the power dynamics between the researchers and the participating students. Measures were taken to mitigate this, including anonymising the e-portfolios and ensuring that students' academic performance was completely unaffected by their involvement in the study. We also recognise that the researchers' intense involvement in the course may have



potentially influenced the data analysis process (28). This was avoided by anonymising the e-portfolios and by carefully reviewing the analysis and engaging in collaborative discussions to reach consensus and maintain the integrity of the research findings.

Results

Participants

A total number of 177 final year medical students participated in the elective course "Steps towards Accreditation of Medical Schools" in the academic years 2021/2022 and 2022/2023 and submitted a total number of 177 E-portfolios as a requirement to pass the course (Table 1).

Table (1): Overview of the academic year, the study cohorts, and the number of e- portfolios received.

	Cohort	Date	Portfolios received	Male/Female ratio
Academic year 2021/2022 6th year medical students	1st cohort	October 2021	24	11/13
	2nd cohort	November 2021	30	20/10
Academic year 2022/2023 5th year medical students	3rd cohort	November 2022	26	12/14
	4th cohort	January 2023	20	10/10
	5th cohort	January 2023	15	8/7
	6th cohort	March 2023	18	10/8
	7th cohort	Mai 2023	31	22/9
	8th cohort	July 2023	13	6/7
Total	177			99/78

The REFLECT rubric

The REFLECT rubric was used as a framework to analyse participants' reflective comments in the e-portfolio sections along the spectrum of 4 levels, ranging from habitual action at the bottom to critical reflection at the top. Within that framework, specific criteria are established to assess and distinguish the four levels. These criteria include writing spectrum, presence, description of conflicts or dilemmas, attention to emotions and analysis of meaning making.

The first category, habitual action, often referred to as unreflective, embodies a default mode of behaviour that lacks deep introspection. It involves the use of superficial, descriptive language primarily for factual reporting, thereby offering vague impressions without deeper reflection or scrutiny. Our analysis of

participants' reflective comments shows that the vast majority of these reflective comments are at the habitual action level across all criteria from the writing spectrum to analysis of meaning making. In these reflections, the writing predominantly adheres to a spectrum of factual reporting, often lacking the depth of analytical inquiry. In particular, the majority of participants' narratives are characterised by a limited presence of personal engagement, with rare consideration of conflict or dilemma. Emotional facets tend to remain largely unexplored, and analysis of the process of meaning making is notably minimal. Participants' reflections mainly consisted of statements about recognising the need to improve communication and conflict resolution skills, with a predominantly factual and straightforward writing style (Table 2, comments 1 and 2). Some



participants acknowledged that they had never engaged in self-reflection before but expressed a desire to become more assertive in group settings, indicating a growing presence in their narratives (Table 2, comments 3 and 4). Other participants shared dilemmas from their secondary school years, illustrating conflicts with bad leaders (Table 2, comment 5 and 7).

Participants engaged with emotions and analysis of meaning making through expressing surprise at their own communication skills, suggesting an intention to engage in more conversations and self-improvement

(Table 2, comment 6). Conversely, other participants shared instances of variance in leadership styles, demonstrating a deeper level of engagement in their reflections with experiences that had elements of both reflective and critical reflection (Table 2, comment 7). This narrative demonstrated a deeper analysis of leadership dynamics.

Overall, the varying degrees of reflective capacity observed in these narratives provide valuable insights into the participants' self-awareness and personal growth in the context of our study.

Table (2): Participants' comments at the level of habitual action

No.	Criterion	Comment
	Writing spectrum	
1		"I don't think it was important to me to be leader for group of people in this age. I want to improve my skills in communication especially in conflict to make people know what my opinion is clearly so I will try to read more about communication skills." Male student, 5 th year, 8 th cohort
2		"I wasn't interested in communication skills before. I know my communication skills not good enough and I will try to improve it. I will listen carefully to people and think before talking and look for reaction of people when talking." Male student, 5 th year, 6 th cohort
	Presence	
3		"I did not take such surveys since it never occurred to me to perform any sort of self-reflection. I always viewed myself as a passive person with little to no passion about anything so I thought I would end up being delegative but turns out in most cases I am democratic. I will try to push myself out my comfort zone more and make sure I have a greater say in any group I'll be a part of in the future." Male student, 5 th year, 8 th cohort
4		"I like the avoidance style because it saves me time, so I don't think I need to improve my skills in that regard." Female student, 5 th year, 8 th cohort
	Description of conflicts or dilemmas	
5		"When I was in the first year of secondary school, the class leader had the responsibility to collect money for exam's paper, but he lost it by a way then he give up and don't take the responsibility of his fault." Female student, 5 th year, 6 th cohort
	Attention to emotions	
6		"I am a bit a bit surprised as I am by nature a quiet person who keeps communication to a minimum, but I did a bit better than I expected. Since I did better than expected, I should engage more in conversation and talk since I am not as bad as I thought which will help me get better." Male student, 5 th year, 7 th cohort



		<p>“I may display what appears to be inconsistent behaviour when faced with similar situations repeatedly. However, this behaviour is not unfavourable and is founded on the lessons I have learned from previous experiences in similar circumstances. I acknowledge that I could improve my ability to exhibit greater patience when tackling problems and accepting that certain things may necessitate more time. I sense that demonstrating patience is a challenge for me in different facets of my life.”</p> <p>Male student, 5th year, 5th cohort</p>
	Analysis of meaning making	
7		<p>“I have a friend from high school. I will call him ‘W’ for privacy. Anyway, W was great and a bad leader when I think about. He was a great captain and leader to our school basketball team. He had amazing skills and willingly taught the team whenever someone asked him too and lastly encouraged us to play better and not be shackled by mistakes that occur while playing. However, when it came to group projects, he had a very authoritarian streak in him. He always had to be the leader and his ideas are always the best. It is fascinating how his persona oscillates between the two.”</p> <p>Male student, 5th year, 8th cohort</p>

The second category, thoughtful action, represents a move up the continuum, indicating a shift towards more elaborate descriptive writing with an increased presence in the reflective comments. While still lacking full reflection, this level involves a more detailed consideration of impressions and experiences. Conflicts and dilemmas are acknowledged but may not be fully explored. Emotions are acknowledged to some extent and there are the beginnings of analysis of the meaning of experiences.

Analysis revealed an emerging awareness and willingness to reflect on personal development and experiences. Without going into detail, the participants' reflective comments indicate a growing understanding of the importance of these aspects in different life contexts, such as sport, personal relationships, and health care. This suggests an evolving capacity for introspection and self-awareness as they progress on their journeys of self-improvement and understanding.

In their writing spectrum, participants highlighted the difference between good and bad leaders in a local football match, emphasising the positive impact of inspiring and encouraging leadership (Table 3, comment 1). Other comments underline the importance of the presence of self-reflection for personal growth, with the student expressing surprise at the depth of self-discovery and commitment to ongoing self-improvement (Table 3, comment 2).

In the reflection of a fifth-year student, there is a compelling authenticity in her acknowledgement of past communication challenges and her sincere desire to develop. The detailed account of her past tendencies and the genuine desire to be a more open-minded listener demonstrate an authentic voice, inviting the reader into the writer's mind and fostering a meaningful connection. This is in keeping with the idea of bringing the whole self to the situation and engaging the reader in a powerful way (Table 3, comment 3).

Similarly, a sixth-year student authentically articulates an ongoing commitment to improving communication skills, particularly in the medical context. The detailed plan for improvement, including adapting to different cultures and making effective use of the clinical curriculum, shows an authentic commitment to the reflective process (Table 3, comment 4). Participants recognise a deficit in conflict resolution skills, express a commitment to improve, reflect on their passive nature, aspire to become more active in their community and see potential conflicts as opportunities for personal growth (Table 3, comment 5).

Other comments highlight the importance of emotional intelligence and effective communication in the medical context. Participants express sensitivity, emphasising careful choice of words and a commitment to improved communication (Table 3, comment 6). Reflections on conflict management highlight a desire to be more proactive and to anticipate potential conflict as an opportunity for personal growth (Table 3, comment 7).



There is also a commitment to listen openly to conflicting ideas and opinions to improve conflict resolution (Table 3, comment 8). A focus on practicing communication with patients, taking into account their different ages, highlights the potential for increased empathy and understanding, and emphasises the psychological impact of good communication on patients (Table 3, comment 9).

Taken together, these reflections explore themes of conflict management, sensitivity, personal growth, effective communication, and the meaningful interpretation of experience in a medical context. In essence, these reflections embody an authentic voice, convey a genuine sense of self-discovery and successfully draw the reader into the intricate details of the students' experiences, fostering a powerful and meaningful connection between writer and reader.

Table (3): Participants' comments at the level of thoughtful action

No.	Criterion	Comment
	Writing spectrum	
1		<p>“During a football match in my local area, I came across a real-life example of a bad leader versus a good leader. The bad leader was shouting and nervous all the time. He tried to tell other team members what to do. He ignored what they said or tried to find something to criticise them about. The good leader encouraged the team members, he was very inspiring, which resulted in winning the match.”</p> <p>Male student, 5th year, 4th cohort</p>
	Presence	
2		<p>“Self-reflection is something that exists, and it can help a person improve. I am surprised to learn a lot of things about myself even though I’m me. I will fill this again when I feel that I improved or changed in my behaviours to know myself a bit more.”</p> <p>Male student, 5th year, 8th cohort</p>
3		<p>“I was not good at communication when I was younger and wanted to do better after getting into university and studying communication as a longitudinal curriculum. I know I always make sure people don’t misunderstand me and often initiate conversations during a fallout and I only get advices over not listening to opinions that I don’t redeem right in my perspective. I want to be a better listener to opinions that I don’t see right and hear them without objecting against them and taking it as an attack to my own opinion.”</p> <p>Female student, 5th year, 8th cohort</p>
4		<p>“I am always planning to improve my communication skills. Especially in the area of communicating with patients and how to educate my patients in a simple way that can be adapted to different cultures. I plan to improve by learning more about how to communicate information and interact with my colleagues and patients in an effective way and by using my clinical curriculum in the final year of medicine as a good tool to develop my communication skills with patients, for example by taking an effective history.”</p> <p>Female student, 6th year, 2nd cohort</p>



	Description of conflicts or dilemmas	
5		<p>“I didn't know that things like conflict management could be learned and that you could improve your sucking skills. I think of myself as someone who behaves in a way that does not create conflict, and I know that I react differently to the same conflict depending on who the other party is, so I remember using all the styles mentioned above.</p> <p>I haven't been in many conflicts due to me being a passive person and I think I am such is because I have little passion about things people around love like football for example. I want to be more active person in my community even if it means there will so some conflicts arising.”</p> <p>Male student, 5th year, 7th cohort</p>
	Attention to emotions	
6		<p>“I am a sensitive person as I tend to choose my words very carefully. I always try my best to communicate well as I usually expect the same from the other person and I always look forward to being a better person in general. I believe that experience is the best teacher.”</p> <p>Male student, 6th year, cohort 2</p>
	Analysis of meaning making	
7		<p>“I haven't been in many conflicts due to me being a passive person and I think I am such is because I have little passion about things people around love like football for example. I want to be more active person in my community even if it means there will so some conflicts arising.”</p> <p>Male student, 5th year, 6th cohort</p>
8		<p>“I will try to listen to conflicting ideas and opinions better and more openly without getting defensive and figure out how to choose an ideal conflict management process to have least damage whether in work or personal life.”</p> <p>Female student, 5th year, 6th Cohort</p>
9		<p>“Practicing communicating with others especially patients of different ages while being attentive to receiver response will improve doctors' empathy and understanding of patients suffering. On the other hand, good communication may help patients psychologically.”</p> <p>Female student, 6th year, 1st cohort</p>

The reflective comments within the e-portfolio, while valuable in capturing different aspects of the participants' experiences, did not consistently reach the pinnacle of reflective capacity as described in the REFLECT rubric. Genuine reflection, characterised by an attempt to understand, question, or analyse events in order to gain deeper insights, was not consistently evident. The reflective comments often remained in the realm of reporting and descriptive writing, reflecting a stage that falls short of the nuanced understanding inherent in true reflection.

Furthermore, the culmination of reflective capacity, known as critical reflection, was not uniformly

achieved. Critical reflection involves a comprehensive examination and critique of one's own assumptions, values, beliefs, and prejudices, as well as an exploration of the consequences of actions. This level of reflection, essential for deeper understanding and possible transformation, was not consistently achieved in the reflective comments. The e-portfolio entries, while insightful, did not consistently go to the depth required for a comprehensive critique of underlying assumptions and beliefs, indicative of the critical reflection stage of the reflective process.



Discussion

The inclusion of reflective writing exercises to teach soft skills in undergraduate medical education is growing, but there's a clear need for tools to support assessment and feedback in this context. The present study uses an innovative tool to assess the reflective capacity of final year medical students participating in the elective course 'Steps towards Accreditation' at the Alexandria Faculty of Medicine. In the following section, we will discuss our findings according to the depth of students' reflections and in the light of the literature. In addition, we will discuss the qualitative use of the REFLECT rubric and finally derive recommendations that could facilitate reflective capacity based on the problems identified in our sample of final year medical students.

The e-portfolio provided students with guiding questions to structure reflection and encourage them to avoid the pitfall of remaining in the descriptive superficial level (29). However, the guiding questions did not always have the desired effect of leading to critical levels of reflection. The results of this study show different depths of reflective capacity among the participants, mainly categorised into habitual action and thoughtful action. Habitual action, which refers to unreflective behaviour, predominates, with participants often using superficial, factual reporting in their reflections. This level lacks the depth of analytical inquiry and is characterised by limited personal engagement and infrequent consideration of conflict or dilemma. This is consistent with the findings of other studies, which have also found that unreflective behaviour, characterised by superficial, factual reporting, predominates among participants (29). On the other hand, a positive aspect of this finding is that factual description corresponds to the initial stage observed in many established models of reflection. This underlines the fact that the students successfully achieved the basic step of factual description in their reflective comments (30, 31). Emotional exploration and analysis of meaning making is particularly minimal. This is consistent with other studies that have used the same rubric and found that emotions were the least addressed by participants in their reflections. One reason for this is the inherent difficulty in engaging with emotions, particularly in an academic context (32).

Several tools have been developed to assess and guide levels of reflection in educational contexts (29, 33-35).

Mezirow's classification of non-reflective, reflective and critical reflection, Boud et al. presented a seven-level conceptual framework for assessing reflection in journals and blogs and Tsingos-Lucas et al. introduced a reflective tool for assessing pharmacy students, adapted from a dental education tool, with three levels and seven stages of reflection. Kember et al. modified a tool to assess students' levels of reflection, categorising them as 'habitual action, understanding, reflection and critical reflection'.

Although the various tools and frameworks provide educators with valuable resources for assessing and guiding students' reflective practices in a variety of educational settings, we chose the Reflection Evaluation for Learners' Enhanced Competencies Tool (REFLECT) rubric for the purpose of this study because of its robust credentials (9). The advantages of this psychometric tool are that it has undergone rigorous validation, demonstrating interrater reliability, face validity, feasibility, and acceptability. The unique feature of the rubric is its ability to encourage student reflection by categorising it into four different levels providing explicit criteria for each level and including five essential writing components within narratives. This makes it a valuable qualitative and formative assessment tool, providing learners with written feedback to support their personal and academic growth and development.

As a contribution to the existing literature, our study offers a distinctive approach by incorporating a qualitative use of the REFLECT rubric. In contrast to previous studies, our research approach deliberately moved away from quantitative inter-rater scoring methods, given the recognised shortcomings of measuring reflection through numbers (7). Instead, we opted for a qualitative analysis of reflective comments. Most theories of reflection advocate an imaginative exploration that includes cognitive, affective, and verbal dimensions in deriving meaning from ambiguous and uncertain circumstances. The limitations of oversimplifying reflection into quantifiable scores can inhibit learners' capacity for expansive introspection. Furthermore, such quantification may inadvertently encourage a tendency for learners to tailor their reflective writing towards the goal of achieving high scores, potentially deviating from the authentic philosophical underpinnings of reflection. This qualitative application of the REFLECT rubric represents a novel contribution and provides a valuable



perspective that is more in line with the holistic nature of reflection as advocated by prevailing theories.

Several studies have highlighted the positive impact of teaching reflection through writing, emphasising its potential to enhance self-awareness, and to promote soft skills in addition to the development of clinical skills (39). However, the availability of tools for both teaching and assessing reflective narratives is limited (40). Portfolio-based learning is a widely used approach to promote students' reflective practice, requiring them to critically reflect on and structure their thoughts about personal and clinical experiences (41). E-portfolios have gained prominence in teaching, learning and assessment of reflective skills and also soft skills (42). This multifaceted tool is designed to encapsulate a student's educational journey and provide a comprehensive representation of their growth and competence. The theoretical underpinnings of e-portfolios emphasise their potential to promote reflective learning, self-regulation and deeper understanding of subject matter (42). However, the integration of e-portfolios into educational practice has not been without its challenges, leading to tensions in both theory and practice. In our study, most reflective comments fall predominantly into the two lower levels of the REFLECT rubric and are characterised by their superficial, descriptive nature, rather than engaging with reflective, critical, or introspective dimensions. This observation is consistent with findings from other studies in the literature (29, 40), and below we outline possible reasons for the prevalence of superficial reflections in our study.

Firstly, we recognise the need to provide students with dedicated time and motivation to engage in reflective practice; in our pilot, participants had only 2 weeks to complete the e-portfolio, which may have affected the depth of their reflection because they didn't have enough time (41). Second, the role of the reflective task as an assessment tool for passing the elective course may have influenced the depth and quality of the reflections, as suggested in the literature (41). There is some debate in the literature about the efficacy of this approach, with some authors claiming that the quality of students' reflections diminishes when they are undertaken for an assessment task (43), while others argue that reflective practice may not occur at all unless it is requested as an assessment task (44).

Thirdly, the language of reflection may have played a role in the depth of the reflective comments. Egyptian medical students use English as a foreign language in

the context of e-portfolios, writing in a foreign language leads to significant deficiencies in the application of higher order thinking, their reflective writing is predominantly at a lower level, characterised by an emphasis on habitual action and basic understanding. This phenomenon is consistent with observations from parallel studies of Iranian medical students engaged in academic activities in English, which revealed a tendency towards lower-order thinking, particularly habitual actions, and basic understanding (45, 46). Notably, the adoption of English in medical education introduces the potential for a clinical communication gap in countries where the native language differs from the language of medical education (47). This distinct observation adds a valuable dimension to the discourse on reflective practices in the specific context of Egyptian medical education, shedding light on the nuanced challenges and patterns associated with the use of a foreign language in reflective writing within the e-portfolio environment.

Several methods were used to ensure the quality of the current research: reflexivity (discussed in the methods section), transferability, credibility and reliability (21). The sample setting and results were described in detail to ensure transferability (external validity). The credibility (internal validity) of the current research has been ensured through a detailed collection of evidence, including prolonged observation of participants on multiple occasions throughout the course (21). Validity was also achieved through the constructive alignment between the research question (what is the nature and depth of reflective writing exhibited by final year medical students participating in the elective course 'Steps towards Accreditation of Medical Schools') and the social constructivist epistemology, in which participants are seen as actively and collaboratively constructing experience and meaning (48, 49). The dependability (reliability) of the current research was maximised through the application of rigorous and systematic procedures of sampling, data collection and analysis, using debriefing and discussion of findings from data collection and analysis (21).

A limitation of this study relates to generalisability: the fact that it was conducted at a single institution (Alexandria Faculty of Medicine) may limit the generalisability of the findings to a wider context. Medical education programmes can vary significantly between institutions, and the results may not be representative of different educational settings. The study focuses on the preliminary evaluation of the e-



portfolio implemented during the academic years 2021/2022 and 2022/2023. However, the short duration of the study may not capture the long-term impact of the e-portfolio on students' reflective skills and overall learning outcomes. Future research could benefit from a longitudinal approach to assess the sustained effectiveness of e-portfolios in promoting reflective practice over time.

Conclusions

In conclusion, there is no denying that habitual action serves as a first step in reflective practice, but effective reflective practice involves going beyond mere factual description. To truly reap the benefits of reflective writing exercises, students should be guided and encouraged to go further and deeper in their reflections. Beyond academic development, these exercises can play a pivotal role in enhancing the overall well-being of physicians by acknowledging the interconnectedness of personal and professional dimensions. Using the REFLECT rubric as a formative assessment tool has the advantage of shifting the focus from merely understanding students' thought processes to a more proactive stance on how we can best support students to navigate and refine their cognitive and emotional landscapes. Looking to the future, the planned piloting of the e portfolio in conjunction with reflective exercises opens up new possibilities for a comprehensive and dynamic approach to student development and provides an opportunity to explore the wider impact of these initiatives on the holistic growth and resilience of future health professionals.

Statements and declarations

Ethics approval and consent

Ethical approval for this study was obtained from the Ethics Committee of the Faculty of Medicine,

Alexandria University, under serial number 0305934, IRB NO: 00012098, FWA NO: 00018699. Students consented to participate in the study which had no impact on the course outcome, as their academic performance was unaffected. A written informed consent section was included in the portfolio. Confidentiality and privacy of student data were rigorously maintained throughout the study. All student portfolios were thoroughly anonymised by the author (MS) prior to the start of the review process. The anonymisation protocol involved the removal of any identifiable information such as names, addresses or other personal details that could potentially compromise the confidentiality of the students. Anonymity was assured; a consent form was signed by participants.

Availability of data and material

Data supporting the current study are available from the corresponding author upon a reasonable request.

Authors contributions

MS designed the study, collected, and analysed the data. AB supervised the design and data collection. Both authors contributed to data interpretation. MS wrote the first draft of manuscript. Both authors contributed to revisions of manuscript. Both authors read and approved the final manuscript.

Conflict of interests

The authors declare that they have no conflict of interests.

Funding

None



Appendix

The REFLECT (Reflection Evaluation For Learners' Enhanced Competencies Tool) Rubric adapted from Wald et al, 2012.

Criterion	Level			
	Habitual action (Nonreflective)	Thoughtful action or introspection	Reflection	Critical reflection
Writing spectrum	Superficial descriptive writing approach (fact reporting, vague impressions) without reflection or introspection	Elaborated descriptive writing approach and impressions without reflection	Movement beyond reporting or descriptive writing to reflecting (i.e., attempting to understand, question, or analyze the event)	Exploration and critique of assumptions, values, beliefs, and/or biases, and the consequences of action (present and future)
Presence	Sense of writer being partially present	Sense of writer being partially present	Sense of writer being largely or fully present	Sense of writer being fully present
Description of conflict or disorienting dilemma	No description of the disorienting dilemma, conflict, challenge, or issue of concern	Absent or weak description of the disorienting dilemma, conflict, challenge, or issue of concern	Description of the disorienting dilemma, conflict, challenge, or issue of concern	Full description of the disorienting dilemma, conflict, challenge, or issue of concern that includes multiple perspectives, exploring alternative explanations, and challenging assumptions
Attending to emotions	Little or no recognition or attention to emotions	Recognition but no exploration or attention to emotions	Recognition, exploration, and attention to emotions	Recognition, exploration, attention to emotions, and gain of emotional insight
Analysis and meaning making	No analysis or meaning making	Little or unclear analysis or meaning making	Some analysis and meaning making	Comprehensive analysis and meaning making
Optional minor criterion: Attention to assignment (when relevant)	Poorly addresses the assignment question and does not provide a compelling rationale for choosing an alternative	Partial or unclear addressing of assignment question; does not provide a compelling rationale for choosing an alternative	Clearly answers the assignment question or, if relevant, provides a compelling rationale for choosing an alternative	Clearly answers the assignment question or, if relevant provides a compelling rationale for choosing an alternative

Acknowledgment

The authors would like to express their sincere gratitude to the final year medical students who participated in this study.

References

1. Belcher R, Jones A, Smith L-J, Vincent T, Naidu SB, Montgomery J, et al. Qualitative study of the impact of an authentic electronic portfolio in undergraduate medical education. BMC medical education. 2014;14(1):1-7.
2. Van Tartwijk J, Driessen EW. Portfolios for assessment and learning: AMEE Guide no. 45. Medical Teacher. 2009;31(9):790-801.
3. Iorio S, Cilione M, Martini M, Tofani M, Gazzaniga V. Soft Skills Are Hard Skills—A Historical Perspective. Medicina. 2022;58(8):1044.
4. Rotenstein LS, Huckman RS, Cassel CK. Making doctors effective managers and leaders: a matter of health and well-being. Academic Medicine. 2020;96(5):652-4.
5. Mamede S, Schmidt HG, Penaforte JC. Effects of reflective practice on the accuracy of medical diagnoses. Med Educ. 2008;42(5):468-75.
6. Sandars J. The use of reflection in medical education: AMEE Guide No. 44. Medical teacher. 2009;31(8):685-95.
7. Grierson L, Winemaker S, Taniguchi A, Howard M, Marshall D, Zazulak J. The reliability characteristics of the

- REFLECT rubric for assessing reflective capacity through expressive writing assignments: A replication study. Perspectives on Medical Education. 2020;9:281-5.
8. Driessen E, van Tartwijk J, Dornan T. The self critical doctor: helping students become more reflective. Bmj. 2008;336(7648):827-30.
9. Wald HS, Borkan JM, Taylor JS, Anthony D, Reis SP. Fostering and evaluating reflective capacity in medical education: developing the REFLECT rubric for assessing reflective writing. Acad Med. 2012;87(1):41-50.
10. Plack MM, Driscoll M, Marquez M, Cuppernull L, Maring J, Greenberg L. Assessing reflective writing on a pediatric clerkship by using a modified Bloom's taxonomy. Ambulatory Pediatrics. 2007;7(4):285-91.
11. David MFB, Davis M, Harden R, Howie P, Ker J, Pippard M. AMEE Medical Education Guide No. 24: Portfolios as a method of student assessment. Medical teacher. 2001;23(6):535-51.
12. Joshi A, Virk A, Saiyad S, Mahajan R, Singh T. Online assessment: Concept and applications. Journal of Research in Medical Education & Ethics. 2020;10(2):49-59.
13. van der Vleuten C, van den Eertwegh V, Giroldi E. Assessment of communication skills. Patient Education and Counseling. 2019;102(11):2110-3.
14. Singh T. Principles of assessment in medical education: Jaypee Brothers Medical Publishers; 2021.
15. Franco CAG, Franco RS, Cecilio-Fernandes D, Severo M, Ferreira MA, de Carvalho-Filho MA. Added value of



- assessing medical students' reflective writings in communication skills training: a longitudinal study in four academic centres. *BMJ open*. 2020;10(11):e038898.
16. Hatem D. Reflection and Narrative in Remediation. *Remediation in Medical Education: A Mid-Course Correction*: Springer; 2023. p. 183-95.
17. Brown A, Jauregui J, Ilgen JS, Riddell J, Schaad D, Strote J, et al. Does the medium matter? Evaluating the depth of reflective writing by medical students on social media compared to the traditional private essay using the REFLECT rubric. *Western Journal of Emergency Medicine*. 2020;21(1):18.
18. Badrawi N, Hosny S, Ragab L, Ghaly M, Eldeek B, Tawdi AF, et al. Radical reform of the undergraduate medical education program in a developing country: the Egyptian experience. *BMC Medical Education*. 2023;23(1):143.
19. NARS: National Academic Reference Standards, Medicine. 2017.
20. Sabry W, ElNaggar Z, Shourab E, Mohamed S, Shehata M, Morsy M, et al. A Behavioural & social sciences core curriculum for Egyptian undergraduate medical education at the Armed Forces College of Medicine.
21. Hanson JL, Balmer DF, Giardino AP. Qualitative research methods for medical educators. *Academic pediatrics*. 2011;11(5):375-86.
22. Agency TE. Self-Assessment Communication Survey 2014 [Available from: https://www.txcte.org/sites/default/files/resources/documents/Self-Assessment-Communication-Survey_0.pdf].
23. Leadership Style Quiz: Southern New Hampshire University; 2023 [08.11.2023]. Available from: <https://www.coursesidekick.com/management/5877>.
24. Reginald (Reg) Adkins P, Elemental Truths. Conflict Management Styles Assessment 2015 [Available from: <https://facultyombuds.ncsu.edu/files/2015/11/Conflict-management-styles-quiz.pdf>].
25. Wald HS, Reis SP, Borkan JM. Reflection rubric development: evaluating medical students' reflective writing. *Medical education*. 2009;43(11):1110-1.
26. Wald HS, Borkan JM, Taylor JS, Anthony D, Reis SP. Fostering and evaluating reflective capacity in medical education: developing the REFLECT rubric for assessing reflective writing. *Academic Medicine*. 2012;87(1):41-50.
27. Kuper A, Lingard L, Levinson W. Critically appraising qualitative research. *Bmj*. 2008;337.
28. Schwandt TA. *Qualitative inquiry: A dictionary of terms*: Sage Publications, Inc; 1997.
29. McNeill H, Brown JM, Shaw NJ. First year specialist trainees' engagement with reflective practice in the e-portfolio. *Advances in health sciences education*. 2010;15:547-58.
30. Gibbs G. *Learning by doing: A guide to teaching and learning methods*. Further Education Unit. 1988.
31. Driscoll J, Teh B. The potential of reflective practice to develop individual orthopaedic nurse practitioners and their practice. *Journal of orthopaedic nursing*. 2001;5(2):95-103.
32. Tracey MW, Hutchinson A, Grzebyk TQ. Instructional designers as reflective practitioners: Developing professional identity through reflection. *Educational Technology Research and Development*. 2014;62:315-34.
33. O'Sullivan P, Aronson L, Chittenden E, Niehaus B, Learman L. Reflective ability rubric and user guide. *MedEdPORTAL*. 2010;6:8133.
34. Kember D, McKay J, Sinclair K, Wong FKY. A four-category scheme for coding and assessing the level of reflection in written work. *Assessment & evaluation in higher education*. 2008;33(4):369-79.
35. Devlin MJ, Mutnick A, Balmer D, Richards BF. Clerkship-based reflective writing: a rubric for feedback. *Medical Education*. 2010;44(11):1143-4.
36. Mezirow J. *Transformative dimensions of adult learning*: ERIC; 1991.
37. Boud D, Keogh R, Walker D. *Promoting reflection in learning a model*. Boundaries of adult learning: Routledge; 2013. p. 32-56.
38. Tsingos-Lucas C, Bosnic-Anticevich S, Schneider CR, Smith L. Using reflective writing as a predictor of academic success in different assessment formats. *American Journal of Pharmaceutical Education*. 2017;81(1).
39. Mann K, Gordon J, MacLeod A. Reflection and reflective practice in health professions education: a systematic review. *Advances in health sciences education*. 2009;14:595-621.
40. Daryazadeh S, Yamani N, Adibi P. A modified tool for "reflective practice" in medical education: Adaptation of the REFLECT rubric in Persian. *Journal of Education and Health Promotion*. 2020;9.
41. Chaffey LJ, de Leeuw EJJ, Finnigan GA. Facilitating Students' Reflective Practice in a Medical Course: Literature Review. *Education for Health*. 2012;25(3):198-203.
42. Walland E, Shaw S. E-portfolios in teaching, learning and assessment: tensions in theory and praxis. *Technology, Pedagogy and Education*. 2022;31(3):363-79.
43. Sargeant J, Eva KW, Armson H, Chesluk B, Dornan T, Holmboe E, et al. Features of assessment learners use to make informed self-assessments of clinical performance. *Medical education*. 2011;45(6):636-47.
44. Grant A, Kinnersley P, Metcalf E, Pill R, Houston H. Students' views of reflective learning techniques: an efficacy study at a UK medical school. *Medical education*. 2006;40(4):379-88.
45. Rajabi Y. Reflection in English for medical purposes. *Education Strategies in Medical Sciences*. 2020;13(5):471-9.
46. Avarzamani F, Farahian M. An investigation into EFL learners' reflection in writing and the inhibitors to their reflection. *Cogent Psychology*. 2019;6(1):1690817.
47. Abi Raad V, Raad K, Daaboul Y, Korjian S, Asmar N, Jammal M, et al. Medical education in a foreign language and history-taking in the native language in Lebanon—a nationwide survey. *BMC medical education*. 2016;16:1-6.
48. Riessman CK. *Narrative methods for the human sciences*: Sage; 2008.
49. Mattick K, Kelly N, Rees C. A window into the lives of junior doctors: narrative interviews exploring antimicrobial prescribing experiences. *Journal of antimicrobial chemotherapy*. 2014;69(8):2274-83.