A model of engagement in reflective writing-based portfolios: Interactions between points of vulnerability and acts of adaptability

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Abstract

Background: Portfolios are widely used for meeting new accreditation standards in the age of competency-based medicine. However, the method of learning through portfolio has been suggested to be vulnerable.
Aim: The aim of this study was to explore conditions affecting the experience of teaching and learning from the perspective of both students and mentors in a reflective writing-based portfolio initiative.
Method: Using mixed-methods rooted in grounded theory, 139 students and 13 mentors completed questionnaires, 23 students participated in four focus groups and 9 mentors in individual interviews.
Results: The overarching theme in our data was student–mentor engagement. Our results confirm previous literature describing portfolio as a vulnerable method of learning, extend this concept by identifying and categorizing specific points of vulnerability, and contribute new knowledge regarding acts of adaptability, which serve to strengthen the student–mentor relationship.
Conclusion: Engagement is central to the success of portfolio and is shaped by a dynamic interaction between points of vulnerability and acts of adaptability. We propose a model of engagement in portfolio that can be used for faculty development to optimize student–mentor engagement.

Introduction

The international shift toward competency-based medical education has necessitated major curricular innovation in order to satisfy new accreditation standards of teaching and assessing intrinsic skill development during medical training (Royal College of Physicians and Surgeons of Canada 1996; General Medical Counsel 2000; Frank 2005; Norcini et al. 2008; Albanese et al. 2010). Portfolios are designed to promote intrinsic competency (Sherbino et al. 2011) development through self-directed learning (Buckley et al. 2009; Sandars 2009; Tochel et al. 2009; Van Tartwijk & Driessen 2009) and reflection (Schon 1987; Sandars 2009; Dekker et al. 2013) and have become the primary strategy with which medical educators are addressing these requirements (Snadden et al. 1999; Friedman Ben David et al. 2001; Dekker et al. 2009; Van Tartwijk & Driessen 2009). Literature supporting the initial uptake of portfolio was largely theoretical (Andrews 2005; Mann et al. 2009), with self-directed learning and reflection cited as related skills (Ettrmer & Newby 1996; Sandars 2009) essential to the development of competency (Ettrmer & Newby 1996; Korthagen 2001; Quirk 2006; Mann et al. 2009; Sandars 2009) and reflective capacity, which was felt to be a necessary

Practice points

- Competency-based medical education has led to wide-spread uptake of portfolios; when used as a means of promoting and assessing intrinsic skill development, the portfolio method has been suggested to be vulnerable.
- Our study identifies reflective writing-based portfolios as a highly relational learning method dependent on student–mentor engagement, which is a critical but fragile phenomenon influenced by dynamic interaction between vulnerability and adaptability.
- We propose a model for portfolio-based reflective writing wherein student–mentor engagement is central to learning outcomes and shaped by points of vulnerability, which degrade student–mentor engagement, and acts of adaptability, which enhance engagement.
- This model can be used in faculty development sessions and student orientation to acknowledge and navigate vulnerabilities inherent to reflective writing in portfolios and to capitalize on adaptabilities that imbue this learning strategy with resilience.

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attribute of competent health professionals (Boud et al. 1985; Schon 1987; Moon 1999; Epstein & Hundert 2002). Over the next 10 years, portfolios, reflection and reflective writing (RW) became intertwined concepts that saw significant uptake in medical curricula, becoming compulsory in some regions (Carr & Carmody 2006; Scheele et al. 2008; Dekker et al. 2009; Kind et al. 2009) and required for licensing and maintenance of competency in others (General Medical Council 2005; College of Family Physicians of Canada 2007). Following that widespread uptake, however, literature began to emerge that the implementation of these learning strategies was fraught (Driessen et al. 2005, 2007; Buckley et al. 2009; Tochel et al. 2009; Van Tartwijk & Driessen 2009), with Driessen et al. reporting in 2005 that “portfolios can be a powerful tool for learning and assessment, but the method is vulnerable to adverse conditions and may easily lead to disappointment” (p. 1235).

Specifically, it has been shown that portfolios do not guarantee that reflective learning occurs (Wade & Yarboourgh 1996; Pearson & Heywood 2004), in part, because medical students do not necessarily recognize or value reflection as a learning strategy (Mann et al. 2009; Sandars 2009; Van Tartwijk & Driessen 2009; Amtfield et al. 2013; Van Schaik et al. 2013) may not know how to engage in reflective learning without considerable guidance (Ertmer & Newby 1996; Driessen et al. 2008; Aronson 2011) and may feel threatened by the time, effort and learning required (Mann et al. 2009; Van Tartwijk & Driessen 2009). Mentors are widely acknowledged to be essential for portfolio learning (Knowles 1975; Schon 1987; Pearson & Heywood 2004; Driessen et al. 2005, 2007; Mansvelder-Longayroux et al. 2006; McMullan 2007; Dekker et al. 2009; Sandars 2009); however, faculty members may not understand their role as mentors (Atkins & Williams 1995; Neary 2000; Bray & Nettleson 2007; Stenfors-Hayes et al. 2011) may not engage in reflection personally, and as a result, may not sufficiently motivate students (Sandars 2009; Van Schaik et al. 2013) and may not have the time or interest to invest in learning how to facilitate student learning through reflection (Wade & Yarboourgh 1996; Pearson & Heywood 2004; Sandars 2009). Accordingly, faculty development is a frequently and strongly cited need for successful portfolio implementation (Driessen et al. 2007; Dekker et al. 2009; Sandars 2009; Van Tartwijk & Driessen 2009; Lesser et al. 2010; Aronson 2011; Dekker et al. 2013; Van Schaik et al. 2013).

Emerging alongside and through these studies has been a body of literature describing the conditions necessary for success when using portfolios; these include a clearly communicated purpose, priming of learners, a flexible learner-centered structure, effective mentorship, consideration of summative assessments along with their limitations and impact, effective written feedback and longitudinal, mandatory integration into the curriculum (Wade & Yarboourgh 1996; Roberts et al. 2003; Shumway & Harden 2003; Pearson & Heywood 2004; Driessen et al. 2005; Sandars 2009; Van Tartwijk & Driessen 2009; Reis et al. 2010; Aronson 2011; Donato & George 2012; Wald et al. 2012; Dekker et al. 2013; Van Schaik et al. 2013; Dannefer 2013). When such conditions are satisfied, learners and educators report positive experiences (Gordon 2003; Donato & George 2012). Despite these advances in understanding, a major gap regarding the use of portfolios in undergraduate medical education is a dedicated exploration of factors influencing the student–mentor relationship when using RW as a learning strategy. Although a substantial literature exists regarding mentorship in other domains of medical education, these do not sufficiently inform educators about the social processes influencing the experience of learning with RW. Given that the learning environment is one of the most important predictors of portfolio success (Driessen et al. 2005; Dekker et al. 2009; Sandars 2009; Donato & George 2012; Van Schaik et al. 2013) and that RW is an increasingly common component of portfolios, addressing this research gap is important and timely.

The purpose of this study was to explore, using mixed methods, the social process of teaching and learning in an undergraduate medical education portfolio initiative using mentor-facilitated RW. The goal of this study was to develop a theoretical framework of the experiences of both learners and mentors with a focus on the modality of learning, course structure, the role of the mentor, the impact of mentor feedback and overall student–mentor relationship.

Methods

Course design

One-hundred eighty third-year medical students at a major Canadian medical school were enrolled in a new reflective portfolio course, the purpose of which was to stimulate professional development and reflective capacity through mentor-facilitated RW. Students were divided into 26 groups of 7–8 students and assigned a faculty mentor, all of whom were clinically active physicians with academic appointments at Western University. Students were expected to submit four RW entries to their mentor electronically via secure server over the course of the year, in response to RW prompts based on principles of Narrative Medicine (Table 1) (Charon 2001, 2006), as well as a CV and personal statement in preparation for Canadian Resident Matching Service (CaRMS). Mentors were required to provide written feedback within two weeks of each RW entry to promote further reflection, and students were required to respond to feedback within two weeks of receipt, creating a three-part written dialogue. To help facilitate student–mentor interactions, three face-to-face meetings were also scheduled through the year: an initial group introductory meeting, for formative feedback and for summative feedback. Students received two one-hour introductory sessions on the nature, purpose, logistics and goals of the course (Appendix A, available as supplementary material online). Mentors received a 1.5 h introductory training session for the same, as well as experiential skills training on crafting written responses to reflective student writing (Appendix B, available as supplementary material online). Throughout the year, three super-mentors skilled in RW provided support to faculty mentors, reviewing the mentor–student exchange at least twice, and providing optional supplementary RW skills training mid-way through the year. Mentors were provided two optional rubrics to assist in identifying the level of RW produced in order to
construct feedback; rubrics were not formally used for assessment. Formative and summative feedback was provided to all students (Appendix C, available as supplementary material online). The course was mandatory and the qualifications used were pass/fail.

Ethics approval

Ethics approval for this study was granted through the local research ethics board (REB# 103549). Opting out at any stage was permitted; participation had no impact on evaluation, which was completed prior to the initiation of this study.

Study design, recruitment and sampling

This study followed a constructivist grounded theory methodology as described by Charmaz (2006). Following the course, all students and mentors were invited to participate in a two-part mixed-methods study using convenience sampling regarding their experience. Completion of the first stage (questionnaire – see Appendix D and E, available as supplementary material online) implied consent that participating students and mentors wished to be contacted for the second stage (student focus groups session or mentor interviews).

Participants

One-hundred thirty-nine of 180 students (77% response rate) completed the paper and pencil questionnaire. Of the 139 participating students, 23 chose to go on to participate in a focus group session following common classroom/clinical hours (12% response rate).

Thirteen of 26 mentors (50% response rate) completed the questionnaire, and nine of these went on to participate in individual mentor interviews (35% response rate). Given that all mentors had competing clinical demands and schedules, interviews rather than focus groups were used for this population in order to improve capture rates. Theoretical saturation was reached with both groups.

Questionnaires

Student and mentor responses to questionnaires served as a foundation to develop and refine the focus group and interview guides. Results of the short answer responses were analyzed and coded in combination with the focus group and interview data.

Focus groups

Focus group discussions were facilitated using an open-ended guide that explored themes emerging from questionnaire results (Appendix F, available as supplementary material online). All focus group sessions were one hour and run by an independent research assistant. Responses were audio recorded and subsequently anonymized. Analysis of each transcribed focus group informed the researcher team on how to best revise the question guide for subsequent sessions in order to develop emerging themes.

Interviews

Individual interviews were conducted with portfolio course mentors either in person or by telephone. An open-ended interview guide, developed from the questionnaire results, student focus group responses and researcher discussion, was used (Appendix G, available as supplementary material online). All one-hour interviews were conducted by the same independent research assistant who ran the focus groups, audio recorded and anonymized.

Qualitative analysis

Data collection for this study ceased when the authors felt that theoretical sufficiency was reached, as described by Charmaz (2006). Focus group and interview recordings were transcribed verbatim by a professional transcribing service. Completed transcripts and questionnaire results were imported into NVivo 10 qualitative data management software (QSR International, Cambridge, MA). The independent researchers, who had no involvement in the construction, implementation or teaching of the portfolio course, conducted initial and focused coding through NVivo to identify patterns within the data. The constant comparative method of analysis was used to compare codes and identify relationships between codes, as is recommended for a grounded theory study (Charmaz 2006). The three investigators discussed the analysis together at multiple stages; differences were discussed and resolved, and quotations in the data were identified that supported the emergent

| Timing of prompts | Prompts                                                                 |
|-------------------|-------------------------------------------------------------------------|
| First iteration   | i. Write about a time you felt lost.                                    |
|                   | ii. Reflect on the scene the first time you saw someone diagnosed with a serious illness. |
|                   | iii. Write about a time you or someone you know needed a translator (paired with reading: Hulyer, Frank. The Blood of Strangers: The Short Arm of Chromosome 4). |
| Second iteration  | i. Write about a time you affected the management of a situation by speaking up. |
|                   | ii. Tell the story of a patient whose cultural or socioeconomic orientation altered their course of treatment. |
|                   | iii. Describe a time that you saw a tense situation diffused.            |
| Third iteration   | i. Record the chief complaint of a memorable case. Then retell the case from the patient’s perspective. |
|                   | ii. Describe a tense situation you were in but from the perspective of the nurse you were working with. |
|                   | iii. Describe a time someone trusted you during clerkship.               |
|                   | iv. Open prompt: Student directed writing on an experience of their choice. |
| Fourth iteration  | i. Describe something you know now that you wish you knew at the beginning of the year. |
|                   | ii. Reflect on a lesson you were taught by one of your patients.         |

Table 1. Reflective writing prompts.
themes. Once the coding was refined, analysis was conducted to further explore the relationships between codes and to elevate the data to a conceptual level. Finally, an interpretive model was developed to provide a meaningful representation of the data.

Results

The dominant theme from analysis of both student and mentor experiences of a RW-based portfolio was student–mentor engagement, where engagement was perceived to be a critical but fragile phenomenon that was susceptible to the influence of points of vulnerability and acts of adaptability.

Points of vulnerability and acts of adaptability

Points of vulnerability worked to degrade student–mentor engagement, and acts of adaptability worked to enhance engagement. Through analysis of the focus groups and mentor interviews, we identified five distinct points of vulnerability inherent to this model of mentor-facilitated RW: (1) structural, (2) aptitudinal, (3) cultural, (4) temporal and (5) relational. We also identified acts of adaptability that arose either responsively or pre-emptively and supported the development of student–mentor engagement.

Student–mentor engagement

When engagement was achieved, students and mentors formed a valuable relationship, participated fully in the course and achieved the positive outcomes of portfolio. Students identified that with an approachable mentor who is willing to share their own experiences, the engagement process could begin as early as the initial meeting.

Mine was very approachable, right from the beginning when we had our first meeting. We went around at that time and just talked about experiences we had...she shared some of her own experiences in that first meeting. I felt already a little bit closer to her (Student, FG#2).

Another student elaborated on their mentor’s willingness to share experiences and the reassurance this provided.

My mentor was very good about her responses and she would either validate things or even come up with her own examples and identify with me. And that was really reassuring to have a physician say, ‘I have been in your shoes and I have felt this way before, these are some suggestions as to what you could do if you wanted to’ (Student, FG#1).

Given the complex relationship between points of vulnerability and acts of adaptability, participants had very different experiences of student–mentor engagement. As one mentor summarized

I think it’s a valuable part of their education. In kind of intangible ways, but I also think it’s a little bit

mentor driven, so you could have the same course, two different mentors and two different approaches and have a very different kind of outcome for the student (Mentor #8).

Students also echoed this notion by summarizing the power of engagement, or a lack thereof, “I think if you have a good group and you have had good feedback then you are more positive about it. And if you haven’t, it seems a bit like a useless exercise” (Student, FG#1).

Points of vulnerability

(1) Structural

Structural vulnerabilities are vulnerabilities inherent to the design of the RW in the portfolio curriculum. One form of structural vulnerability identified by a number of students was the format of RW prompts. Although some students appreciated the focus provided by the prompts, others indicated that these prompts restricted their ability to engage with the writing by choosing an experience that held personal meaning. Many students identified that they would have preferred more open-ended prompts:

I was initially really excited, because I do a lot of writing outside of this. So, I thought this is a chance to do something, but also in a medical setting. But it was restrictive to me to have to answer a prompt...I would have preferred if it was open-ended...It felt a little bit fake to me sometimes versus what I might just write freely (Student, FG #2).

Another source of structural vulnerability surrounded the ability of students to be honest in RW that was for an audience. While some students felt that they could be more honest through written reflection, others indicated being “selective” in what they wrote because of a lack of perceived anonymity beyond the student–mentor relationship, “It’s not anonymous, the portfolio is not made to be anonymous. With lacking anonymity there comes a bit of guardedness by nature” (Student, FG#2). Another student elaborated, “There were some points where I might have felt like there were some things I wouldn’t want to talk about because it would be too personal...I definitely didn’t feel like I could share [just] anything” (Student, FG#1).

Students uploaded their RW pieces to a password-protected, secure server, and each reflection was only viewed by their individual mentor. Despite these safeguards, some students still did not feel safe enough to reflect openly. One student indicated this could be influenced by the fact that some mentors were influential members of departments that students may be interested in applying to for residency programs

I was talking to one person...they modified what they wrote based on who their preceptor was and what role that preceptor had in administration. Mainly, if this person has any sort of role on a residency selection committee, then why should this [student] divulge their internal debates about what
they want to do [for residency] when they want to come across as confident that they want to be in whatever specialty that this person is part of the selection committee for? (Student, FG#2)

Other points of structural vulnerability arose with the use of electronic dialogue as the predominant form of communication for student-mentor dialogue and mentor feedback about the written reflection. As one student explained, “It was hard to really communicate with mentors via email. The discussions were quite limited” (Student via questionnaire). A mentor elaborated by saying, “Although I’m very used to working through email, I sense that the lack of my ability to see body language in a way hindered me. I was trying to not over interpret communications through email, but it is hard not to” (Mentor #7).

(2) Aptitudinal

Aptitudinal vulnerabilities refer to variability in the innate skill sets of mentors and students. The aptitude of participants was observed to play a major role in their experience of portfolio. Students entered the course with varying skill levels in both writing and reflection. “…Because maybe that is one element as to why not everybody likes it, not everybody is a writer or likes to put their thoughts on paper” (Student, FG#1). Similarly, not all mentors were equal in their aptitude for providing effective feedback. Students pointed out that there was little to gain from feedback that was vague and simply statement-based, “…if I’m writing something to someone, I’d hope for more of a response than, ‘Good job, I appreciate your reflection’” (Student, FG#2).

Aptitudinal vulnerability also arose when mentors focused on mechanical aspects of the RW entry, such as grammar and spelling, rather than addressing the content of the reflection. As one student reported “…the only pieces of advice on my reflections were grammatical corrections. I was like, ‘I guess I should probably know how to spell things.’ But this is unhelpful for this learning purpose” (Student, FG#4).

Insufficient or unhelpful mentor feedback was capable of producing negative consequences, even for previously interested students. One student describes the impact of sparse feedback by saying

I think at the beginning I really felt kind of excited about it, like I said, I like to write. I met my mentor and thought she was a reasonable person and then the feedback wasn’t there, it was kind of like one sentence. Then I wasn’t as excited (Student, FG#2).

(3) Cultural

Cultural vulnerabilities were observed when the attitudes of peers, colleagues and teachers locally, or the attitudes within the global medical community, influenced student attitudes toward portfolio. For example, students who entered portfolio with enthusiasm were vulnerable to the negative attitudes amongst their peers:

I guess in my group it was mostly negative if I can be frank and honest….And I think part of that does impact how much effort you put in, because if everyone else looks at it as an invaluable tool, then ultimately it does impact you (Student, FG#3).

Another form of cultural vulnerability was observed through students commenting that the class had a sense of being “lab rats” or “guinea pigs” because portfolio was a new course that year:

…it was mentioned that it’s supposed to be a longitudinal thing throughout our school years. So, I feel like part of the reason that we had such [expletive] buy-in was the fact that it’s new to us. Like, last year’s group didn’t have to do this, and now we all have to write (Student, FG#4).

Attitudes of mentors were another aspect of cultural vulnerability. A student explained, “…I think you just need faculty buy-in, as well as student buy-in. And I think when the students get a bad taste from the faculty initially, then the students are going to be less motivated” (Student, FG#4).

For a student whose “preceptor basically said she didn’t think reflecting like this was important and didn’t want to be doing this” (Student via questionnaire), the overarching culture was not conducive to a meaningful RW experience.

(4) Temporal

Temporal vulnerabilities were variables inherent to the timing of assignments, the timing of feedback, and on a larger scale, the timing of the portfolio course within the medical school curriculum. When students received mentor feedback months later, they were less likely to value the feedback, less motivated to complete their RW pieces and less likely to feel as though they benefitted from the course. One student described her reaction to feedback months after the submission by saying, “I didn’t even bother thinking about it because it was three months down the line. I was like, ‘I don’t even remember what the situation was’” (Student, FG#4). In some instances, feedback was not only delayed, but entirely absent. For many students who approached the course with an open mind and enthusiasm, late or absent feedback was enough to “turn them off” the process entirely.

I bought in initially. I put a lot of effort into my first one. And then, when I heard nothing back, I was kind of like….Hmmm, that was a lot of my time….and clerkship is crazy. So I don’t think you could get that buy-in back (Student, FG#4).

However, students did acknowledge reciprocity in this process,

…it’s a two-way street. I wasn’t good at my deadlines…there was no way I could expect her to give meaningful feedback, given the amount of time I gave her to do it….I think my preceptor, she would have done a better job if I had done a better job in giving her my stuff earlier…(Student, FG#4).
Mentors also identified time management as a point of vulnerability, saying, “Sometimes it was difficult to find the time to read the reflections, formulate my observations/questions and respond to the students within a few days. Again, this assignment was a late addition for me thus the competing interest for my time” (Mentor via questionnaire).

(5) Relational

Relational vulnerabilities were categorized as interpersonal interactions that influenced the ability of participants to form a successful student–mentor relationship. When students perceived mentor effort or enthusiasm to be low, this had a negative impact on their ability to form a student–mentor relationship. One student explained the consequences of waning mentor involvement by saying, “as they put in less effort, I was less motivated to do work” (Student, FG#4).

As a result, not all of the relationships developed successfully. Difficulties arose if there was a mismatch between student and mentor interest or comfort level sharing personal experiences. As one student described, “…you’re talking about a lot of fairly personal things to someone who you have possibly met once. And you may not even have formed any form of a relationship in that meeting” (Student, FG#4).

Another student emphasized that the process was vulnerable to a lack of feedback due to the very personal nature of reflection, “if you pour your heart out, and then no one gets back to you, it’s kind of a really bad experience” (Student, FG#4). Mentors recognized this vulnerability as well, and one elaborated by saying

They’re conveying in many ways their thoughts and feelings. I think there’s an added element of sensitivity and a specialized approach that the teacher, the faculty member, needs to make. If people are baring their souls, we want to be able to provide feedback in a very supportive way. I think that’s a critical difference from the traditional teaching role (Mentor #5).

Mentors also identified that the student–mentor relationship was vulnerable if they were made to “chase” or “hound” students for late submissions. As one mentor described

…a couple of the students were just totally resistant to the whole course. And feeling like here I am spending my volunteer time and I’m not going to hound you guys to hand in your results. You’re grown up adults. You can sink or swim (Mentor #8).

Acts of adaptability

Acts of adaptability occurred either responsively or preemptively to points of vulnerability and could occur at the individual or system level. For instance, the structural vulnerability of writing prompts as “restrictive”. This emerged as an act of adaptability at the level of course administrators who acted responsively to provide “open” prompts that allowed students to write about any clinical event that they felt was relevant and worthy of reflection. Students recognized this change and reported that the third and fourth time “we had open-ended prompts and that I found much more freeing” (Student, FG#2).

Another act of system adaptability occurred when course administrators acted to replace a mentor early in the year. Students commented on the stark contrast in their experience between the two different mentors:

[We actually had a different [mentor] who met with us for our first meeting and kind of said, ‘I don’t know why they’re making you guys do this. If you write anything at all I’m not going to fail you’… We were all like, ‘That doesn’t sound very useful’. But then we got Dr. X and it was just like, ‘Oh wow, this is going to be a good experience’… Then having someone who was really engaged in the process with us and actually gave us very meaningful feedback… and met with us personally, it made it feel like your time was well spent (Student, FG#2).

This responsive act of adaptability impressed another student and had a major impact on their experience of portfolio, “Our mentor experience was very poor at the beginning, I was very impressed by how quickly this was addressed when we brought it to faculty. The experience was great in the end” (Student via questionnaire).

At the same time, students could also act adaptively. For example, students frequently identified a level of anxiety toward the upcoming Canadian Residency Matching System (CaRMS) process. Adaptability emerged when students recognized ways Portfolio could help prepare them for the application process; these students often placed a higher value on the course. As one student explained how their perception changed over the year,

I think it took a couple of prompts for me to get into the swing of it. When it started to click was around the time that I started considering electives and residency applying… I thought how useful these are because these things may come up in interviews in terms of sharing this experience or that experience. And that is when I said, oh okay I see; this is a little bit more than a mindless activity we are doing, this actually has a purpose (Student, FG#1).

Although the quality of feedback served as a point of aptitudinal vulnerability, an act of adaptability occurred when mentors took the time to work with students to actually explore their reflections. Students appreciated mentors who pushed them to pursue their reflections in more depth, “My mentor was instrumental to the process and provoked us to explore deeper issues” (Student via questionnaire).

There was a missed opportunity for greater adaptability, as both students and mentors identified that there are other modalities suitable for reflection, for example, poetry or art. At the request of one student, a mentor commented, “I gave freedom to one of them to write in poetry – this was very helpful although more difficult for me to ‘tease out’ the reflection” (Mentor via questionnaire).
Some mentors went beyond expectations by providing students with examples of their own written reflections. A mentor described their personal decision to complete their own reflections:

> So every time a prompt came out, I chose one and I did my own reflective writing and submitted it to my students... for me I felt like I shouldn't ask people to do something I wasn't willing to do myself (Mentor #4).

Students agreed with this sentiment and many expressed an appreciation for this level of commitment displayed by some mentors:

> ...it really allows them to maybe showcase some of their vulnerabilities or their difficult experiences with you and as such maybe you feel more comfortable sharing some of your own with them... it's easier to do that to disclose personal feelings to somebody if you have some reciprocity (Student, FG#2).

A potential act of adaptability was proposed by students to address the personal nature of reflection and counteract the cultural vulnerabilities of portfolio in the future. Some students suggested that a more longitudinal process during medical school might provide a better opportunity to bond with mentors:

> So, you start off with having this relationship established in first and second year. And then, by the time you get to clerkship, it's already longitudinal. So, there would be somebody that you feel comfortable going to (Student, FG#4).

### Discussion and conclusion

The overarching theme of our data was student–mentor engagement, which we were well positioned to explore due to the educational design of our RW based portfolio course, which purposefully required written dialogue between mentor and student, and because our research design enabled an examination of the perspectives of both students and mentors. Our results confirm previous literature describing portfolio as a vulnerable method of learning, extend this concept by identifying and categorizing specific points of vulnerability and contribute new knowledge regarding acts of adaptability, which serve to strengthen the student–mentor relationship. We propose a model for portfolio-based learning (Figure 1) in which student–mentor engagement is central to creating a positive learning experience and shaped by the dynamic interaction between points of vulnerability, which work to degrade student–mentor engagement, and acts of adaptability, which work to enhance engagement. This model shares similarities to Engagement Theory, where the fundamental concept is that students must be meaningfully engaged in learning activities through interaction with others and worthwhile tasks (Kearsley & Schneiderman 1999). We suggest that medical educators use our model of engagement when conducting faculty development and student orientation sessions for RW-based portfolios, in order to recognize and...

Figure 1. A model of student–mentor engagement in portfolio. Student–mentor engagement is a critical but fragile phenomenon in portfolio and influenced by points of vulnerability, which work to degrade student–mentor engagement, and acts of adaptability, which work to enhance engagement.
navigate vulnerabilities inherent to this learning strategy, as well as to capitalize on adaptabilities that imbue portfolio with resilience.

Driessen et al. (2005) were the first to describe portfolio as a “vulnerable” method of learning and reported that adverse conditions such as poor mentoring, undefined curricular structure, lack of student assessment and lack of meaningful experiences on which to reflect contributed to disappointing outcomes. Driessen et al.’s (2005) corollary list of conditions required for successful reflective use of portfolios was subsequently expanded upon by others, with many groups reporting on the importance of mentorship, feedback and supportive cultures of learning (Westberg & Jason 2001; Mann et al. 2009; Tochel et al. 2009; Stenfors-Hayes et al. 2011; Arntfield et al. 2013; Dekker et al. 2013; Van Schaik et al. 2013). This study confirms, extends and synthesizes the factors that negatively influence the experience of portfolio learning into five specific points of vulnerability: (1) structural, (2) aptitudinal, (3) cultural, (4) temporal and (5) relational. Unlike earlier reports, our findings reflect the perspectives of both students and mentors, and as such, lend support to previous findings that were based on only one of these groups (Dekker et al. 2013; Arntfield et al. 2013; Van Schaik et al. 2013). In addition, our study adds new dimensions to previous reports, such as the importance of the temporal aspect of mentor feedback, where late or absent feedback disrupts the potential for a dialogue to occur, de-values RW as a legitimate learning strategy and weakens engagement.

Positive reports on the use of portfolios have become increasingly common (Donato & George 2012; Gordon 2003; Reis et al. 2010; Aronson 2011; Danneler 2013). This study offers similar encouragement to medical educators using RW-based portfolios through the novel observation that portfolio can be made resilient to vulnerability via dynamic acts of adaptability. A new finding from this study that assists in the evolution of portfolios is the responsive and pre-emptive acts of adaptability could be quite powerful; some students and mentors in the sample who were resistant became fully engaged through these acts of adaptability. Responsiveness and pre-emptive acts of adaptability highlight the disservice that a “one size fits all” mentality can have in portfolio courses, and stress the need to tailor portfolio courses to specific medical education institutions. Fostering the adaptability of a portfolio curriculum to the specific needs of mentors and students can assist educators developing strategies to improve mentor recruitment, training and retention. This conceptual framework may also help educators to design orientation for students new to portfolio-based RW (Van Tartwijk & Driessen 2009).

With respect to student–mentor engagement, we found that engagement was a bi-directional and cyclical process in which a strong mismatch between student and mentor engagement was damaging to outcomes for both parties, while even limited initial engagement, when it came from both participants, fed-forward in a positive fashion. Driessen & Scheele (2013) describe this phenomenon as a relational barrier to mentoring, where there is inadequate match of mentor and mentee. Likewise, Jackson et al. (2003) highlighted the importance of “chemistry” in the mentoring relationship that can be as complex as the relationships with friends or family and as equally personal. Mentors reported their motivation to engage in the process suffered when dealing with students who did not hand in work on time and when they had to struggle to evaluate submissions that were of poor quality. In turn, students reported they did not expect quality feedback from their mentors if they knowingly handed in poor-quality work. Establishing a positive relationship was integral to students developing the trust necessary to disclose personal feelings and experiences during the RW process, and many students appreciated mentors who met individually or as a group with students at the beginning of the process to foster this relationship, or who demonstrated reciprocity by sharing their own reflective work. Engagement was therefore seen as central to the success of portfolio achieving its intended objectives and a by-product of the interaction between points of vulnerability and acts of adaptability.

Portfolios represent the most widespread and well-studied curricular innovation made in response to competence-based medical education movement and its associated need for reflective skills in medical education. Educators have a vested interest in persisting with this method for promoting and assessing reflectivity in undergraduate medical education, but the vulnerability of RW and the consequent potential for negative experiences for both teachers and learners pose a threat to its long-term successful implementation. Given that student and mentor resistance is the primary cause of failure for humanities based curricular interventions (Shapiro et al. 2009), the ability to foster positive, long-term culture change will be a requirement for portfolio to succeed. In keeping with this, the most recent systematic review published on the use of reflection in health professional education (Mann et al. 2009) states that “if culture does not legitimize the strategy, reflection may not be used, potential benefits may be lost, and negative experiences may result” (p. 615). Our novel theoretical framework can be used by medical educators to recognize vulnerabilities inherent to portfolio-based RW and to capitalize on acts of adaptability that imbue RW-based portfolios with resilience.

Limitations of this study include the short duration of the new RW curriculum (one year) with high reliance on written dialogue between mentor and student. Other limitations include the inconsistency in the quality of mentors.

Future research is needed regarding the nature of student–mentor dialogue generated through the RW process in order to further explore the mechanisms that shape student and mentor engagement and the development of reflective capacity. The need to explore and study a longitudinal RW course that continues for several years and fosters stable student–mentor dyads is also needed. As our understanding of this learning modality grows, experimental and psychometric research regarding the utility of portfolio as a learning strategy will also be possible.

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Supplementary material available online

Appendix A–G.