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"*I did not check if the teacher gave feedback*": A qualitative analysis of Taiwanese post-graduate-year-one trainees' e-portfolio feedback-seeking behaviours

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RHF conceived the study. RHF and LVM designed the work. YHC contributed to the acquisition of the data. All authors contributed to the analysis and interpretation of data. RHF, FQ and LVM drafted the initial manuscript. All authors revised the manuscript critically for important intellectual content. LVM and RHF substantially revised the paper. All authors gave their final comments and approval of the version to be published. LVM is the guarantor, agrees to be accountable for all aspects of the manuscript, has access to the data, made the final decision to submit and will ensure that any questions relating to the accuracy or integrity of any part of the manuscript are appropriately investigated and resolved.

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Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

Ethical Approval

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Transparency declaration

Lynn V Monrouxe (the manuscript's guarantor) affirms that the manuscript is an honest,

accurate, and transparent account of the study being reported; no important aspects of the study have been omitted; and any discrepancies from the study as planned have been explained.

Copyright/licence for publication

Patient consent

Not applicable.

Data sharing statement

The raw data for this research comprises audio-recordings of interviews. The principal investigator (R.H. Fu) has access to this specific data set, including interview transcripts, in addition to participant contact details and signed consent forms. All authors have access to anonymised data from this set. All data are securely stored in on password-protected and encrypted computers. Participants have not given their permission for data sharing outside the research group. Thus, no additional data is available.

Abstract

Objectives: Despite feedback being an extensively researched and essential component of teaching and learning, there is a paucity of research examining feedback within a medical education e-portfolio setting including feedback-seeking behaviours (FSBs). FSBs can be understood within a cost-value perspective. The objective of this research is to explore the factors that influence post-graduate year-one (PGY1) trainee doctors' FSBs via e-portfolios.

Setting: Post-graduate education provision in the largest teaching hospital in Taiwan.

Participants: Seventy-one PGY1s (66% male).

Methods: A qualitative semi-structured one-to-one interview method was adopted. Interviews were audio-recorded, transcribed verbatim, anonymized and checked for completeness. Data were analysed inductively via thematic Framework Analysis and deductively informed they FSB theory. The process comprised: data familiarization, identification of the themes, charting and data interpretation.

Results: Two main themes of FSB-related and e-portfolio-related were identified. We present the theme focussing on FSB here to which n=32 (22 males, 10 females) of the n=71 participants contributed meaningfully. Sub-themes include factors variously affecting PGY1s′ positive and negative FSBs via e-portfolios at the individual, process and technological levels. These factors include learner-related (internal values vs. social influence, forced reflection); teacher-related (committed educators vs. superficial feedback); technology-related (face-saving vs. lagging systems; inadequate user-interface); and process-related (delayed feedback, too frequent feedback) factors.

Conclusions: Our findings reveal the complexity of PGY1s' FSBs in an e-portfolio context and the interaction of numerous facilitating and inhibiting factors. Further research is required to understand the range of facilitating and inhibiting factors involved in healthcare learners' FSBs across different learning, social, institutional and national cultural settings.

ARTICLE SUMMARY

Strengths and limitations of this study

- To the best of our knowledge, this study is pioneering in that it explores the issues of trainee doctors' feedback seeking behaviours within the context of e-portfolios
- The qualitative interview method adopted, alongside our understanding of current theoretical perspectives of feedback seeking enabled us to unpack the learner, teacher, technological and process-related factors impacting on trainees' willingness to seek out and utilise teachers' feedback within an e-portfolio setting
- Although only n=32 participants meaningfully contributed to our findings. This is a substantial number for a qualitative study of this kind, considering the detailed information that each participant provided.
- The context of feedback seeking behaviours within e-portfolios in a Taiwanese teaching hospital is likely to have emphasized some of our findings, including the face-saving utility

Introduction

Feedback is an essential component of the teaching and learning process and has been extensively researched in this decade.[1] Giving learners feedback means letting them know, in a timely and on-going way, how they are progressing.[2,3] Indeed, during clinical placements, the provision of feedback is an integral part of the learning process, enriching students' learning experience.[3] Constructive feedback from educators enables learners to gain insight into their actions and consequences, and this allows both learners and teachers to successfully achieve personal and program-related objectives.[4]

Furthermore, research suggests that some forms of feedback (e.g., reinforcement, video/audio feedback, computer-assisted instructional feedback) can be more effective than others, with effective and regular feedback having the potential to reinforce good practice and motivate the learner toward the desired outcome.[5] However, feedback is a two-way process. Although a general complaint heard from students and trainees is often that "*I never receive any feedback*",[6] some clinical teachers believe that students and trainees often lack motivation for seeking feedback.[3,7] To investigate whether it is just a matter of motivation, our study focuses on trainee doctors' feedback-seeking behaviour (FSB) within e-portfolios.

Feedback-seeking behaviour

Feedback-seeking behaviour (FSB) has been defined as "[a] conscious devotion of effort towards determining the correctness and adequacy of behaviours for attaining values and states".[8] For this to happen, it requires both conscious effort and motivation to change.

A recent scoping review of the literature around feedback for learners in medical education failed to identify any studies on learners' FSB.[1] Indeed, although we identified a small number of papers on FSB within medical education, the vast majority of research was conducted in organisational contexts adopting existing FSB theories without challenging their validity.[9]

FSB seems to occur in two primary ways: requesting feedback from another (typically senior) colleague or observing others' behaviours.[10] Ashford and colleagues proposed that the cost and value of any given action are the primary determinants of FSB.[11] Nevertheless, a number of factors affect cost and value of actions. For example, one key perceived cost is *self-presentation*, including the potential embarrassment of revealing one's lack of knowledge, thereby drawing attention to personal deficiencies. Other costs include *ego costs*

(i.e., the risk of being the recipient of negative information), and *effort costs* (i.e., the risk of wasting energy and time with little return value).

Value is the perceived worth of FSB in learning new behaviours/skills to improve performance.[10] As such, the *expectancy* of this value has been shown to increase the frequency of FSB.[12] Furthermore, self-preservation is associated with value: through requesting feedback we can create or enhance a positive image of ourselves.[10] This theoretical work appears to transfer well into a medical education context. A qualitative study examining FSB in veterinary students during their clinical years found their FSB to be affected by perceived ego (e.g., feeling incompetent through negative feedback), image (e.g., the presence of peers) and costs and benefits (utility of feedback).[13]

Goal orientation theory (personal goal preferences in achievement situations) has also been used to understand influences on the feedback-seeking process and comprises two main orientations: *performance* and *learning* goal orientations.[10] *Performance goal orientation* focuses on demonstrating and validating one's competence by seeking favourable (and avoiding negative) judgments. Here individuals focus on the cost of feedback-seeking, leading to low FSB. *Learning goal orientation* emphasizes developing competence: increasing FSB to benefit their job performance and for self-enhancement.[10] Situational factors have been shown to have a strong impact on which orientation is used.[10]

Research in medical education has considered resident doctors' goal orientation around feedback-seeking.[14] A positive relationship between the value placed on feedback and FSB frequency was identified.[14] Additionally, the situational factor of having a supportive supervisor influenced residents' likelihood to place a high value on feedback and see fewer costs for FSB.[14] Furthermore, research with residents in Switzerland also supported the influence of situational factors on FSB: supervisors' promotion of feedback-seeking was the sole predictor of residents' FSB through inquiry and increased their learning goal orientation.[15] Finally, this situational factor was associated with lower ego-protection and impression management concerns.[15]

Other research in organizational and educational settings suggests that national culture can influence FSB.[3,7] Motives underlying FSB include: an *instrumental* motive (high FSB to facilitate personal goal achievement and develop behaviours); an *image-defense* motive (FSB is tied up with a wish to maintain a high social image); and an *ego-defense* motive (in an attempt to maintain one's ego individuals avoid seeking feedback or do so strategically)[7]. Individuals from Western and Eastern (particularly Chinese) cultures are thought to react differently to such influences. Indeed, research with Chinese management students suggests

that FSB is strongly related to the issue of face (i.e. the fear of losing face before others), resulting in FSB being low when others are present.[3]

Feedback via e-portfolios in medical education

Portfolios assess what a learner does when functioning independently in the clinical workplace and are designed to stimulate learning from experience.[16,17] Nowadays, portfolios are mostly digital (e-portfolios), with content that can be prescribed or left to the learners' discretion. Despite variations, their role is to record work undertaken, feedback received, progress made and plans for improvement.[18]

Although staff and trainees do not always share a common understanding of the role of feedback in supporting learning,[19] evidence suggests that well-implemented portfolios are effective and practical, increase personal responsibility for learning and support professional development.[20] Furthermore, e-portfolios seem to encourage reflection among users.[20] On the downside, scepticism about the purpose of the e-portfolio and lack of time in filling are also reported.[21] However, despite the plethora of research that has been undertaken examining FSB in an organizational setting,[22] and the potential of e-portfolios for supporting the feedback loop, to our knowledge there is no research to date that has examined FSB in the context of e-portfolios.

Aim and research question

The aim of our research is to understand postgraduate year one medical trainees' (PGY1s') FSB in the context of an e-portfolio. PGY1 trainees are in the transitional period between medical student and clinical physician. Specifically we wish to answer the following research question (RQ):

RQ: What are the factors that influence PGY1s' FSB within an e-portfolio context?

Methods

Study context

The study was conducted at the largest teaching hospital in Taiwan. PGY1s are licensed physicians who receive a training program as they transition from medical students to specialty residents. The PGY1 training program of general medicine was implemented by the Taiwanese government for professional training in general practice in 2011. E-portfolios were introduced in 2013,[22] and gradually substituted paper-based portfolios. The portfolio in this

setting is a collection of evidence of the PGY1s' learning experience during their training. It comprises a default template for several assessment and evaluation criteria including a quantitative assessment (e.g. Mini-Clinical Evaluation Exercise (Mini-CEX), Direct Observation of Procedural Skills (DOPS), Case-based Discussion (CbD)) and qualitative, reflective writing sections (e.g. Medical Ethics and Legislation Report, Medical Care Quality Report and Personal Development Report). According to Taiwanese regulations for e-portfolios, trainees are expected to fill the e-portfolios numerous times over the course of their training (14 objective assessments and 22 reflective writing reports during the PGY1 training). Clinical teachers are required to provide feedback about trainees' reports following each submission. Thus, PGY1s receive feedback for different assessments and from different rotations during the same training period.

Patient involvement

No patients were involved in the design or instigation of this study.

Design

A qualitative study with one-to-one, semi-structured interviews was employed to explore the perception and experience of PGY1 trainees about their engagement with clinical teachers' feedback provided in their e-portfolio. Following the piloting of the interview questions (n=5 PGY1) only slight changes were made. Several questions were asked in the interview, including: There are numerous reports and assessments in the e-portfolio which are followed by clinical teachers' feedback, did you read them all? If so, why? If not, why not? Do you think you have received appropriate feedback in your e-portfolio? Is there any difference between paper-based, e-portfolio and face-to-face feedback? Do you find it helpful to receive clinical teachers' feedback through the e-portfolio? Does feedback affect you in any aspect of your clinical practice? Do you change your behaviour or advance your knowledge following feedback?

Participants

Following ethical approval, all 118 (65% male) PGY1 trainees from the 2014 cohort were approached to participate. Participants were self-selected using purposive sampling. When the researcher contacted the trainees, a brief introduction including the purposes and methodology of the research project was given to the trainees. They were told that the research was investigated by physician educator. However, there were nine physician educators in our hospital. The trainees were assured that the interview would be anonymized after transcription. The research team members only analyzed anonymized data. The

researcher that performed the interview didn't know any of the trainees before they met. All participation was voluntary. Participants comprised n=71 PGY1 (60% of cohort; 66% male) trainees. Informed consent was obtained. The interviews were arranged within the last three months of their training courses so that all participants were familiar with the e-portfolio system.

Procedure

A researcher, who was a previous medical technologist (YHC) external to the hospital with interview experience, conducted all interviews. Interviews were conducted in a quiet room at participants' convenience. Interviews were audio-recorded, transcribed verbatim, anonymized and checked for completeness. Each interview lasted around 20-30 minutes and took place in a private room at the hospital.

Data analysis

Data were analysed using inductive thematic Framework Analysis,[23] comprising: data familiarization, identification of the themes, charting and data interpretation. Additionally, as cost-value and goal orientation theories were known to the researchers, it is acknowledged that they also influenced data analysis deductively (although data were not specifically mapped to these theories). Four researchers (RH, YHC, CCC, PWH) read the transcripts, distributing them among each other so that all transcripts were read by at least two people. Following this, two researchers (FQ, LVM) joined the team to further develop the thematic focus of FSB. Data were translated from Mandarin to English by the CG-MERC official translator (see Acknowledgements). The researchers came together several times to discuss the coding framework development. Data were coded by one person. As the data were coded, further developments of the themes were discussed with the wider team and incorporated into the final analysis.

Results

Two main themes were identified, of which one is FSB-related and the other one is specifically related to the e-portfolio in use (i.e. comparison between e-portfolio and paper-based portfolios). This research reports on the theme of "Inhibiting and facilitating factors around FSB", which comprises four sub-themes (see Table 1). Thirty-two (22 males and 10 females) of the 71 participants contributed meaningfully to this theme, presented here. The remaining n=39 participants mainly focussed their talk around the e-portfolio in general (e.g. their engagement with it and with reflection) and comparisons between online and paper-based portfolios: and while responding to the direct questions around feedback seeking, they

did so superficially and therefore failed to contribute meaningfully to the issue of feedback-seeking behaviours.

Table 1: Learner, teacher, technology and process-related factors for trainees' feedback-seeking behaviours

	Inhibiting factors	Facilitating factors
1: Learner-focussed	Poor learning-needs assessment (*what to have feedback on*) Emotional reactions (*about teachers*)	Value placed on feedback (*feedback as a gift to be saved*) Value placed on teachers (*learning from seniors*)
2: Teacher-focussed	Delayed feedback (*irrelevant*) Generic feedback (*irrelevant*)	Relevant feedback (*high utility; facilitates self-regulation*) Dedication to teaching (*high utility; trainee respect*)
3: Technology-focussed	Poor user-interface (*time-wasting; irrelevant material upload*) Lack of reminders (*forgetting to check*)	Online versus face-to-face (*face-saving utility*)
4: Process-focussed	Timing (*repetition*) Frequency (*workload*)	None mentioned

Inhibiting and facilitating factors around trainees' feedback seeking behaviours (FSB)

Participants discussed their engagement with feedback in terms of if and when they sought it within the e-portfolio. They discussed the various factors that influenced their engagement that we report as sub-themes: (1) learner-focussed factors; (2) teacher-focussed factors; (3) technology-focussed factors; and (4) process-focussed factors.

Sub-theme 1: learner-focussed factors

This sub-theme focuses on the inhibiting and facilitating learner-related factors to participants' FSB. In terms of inhibiting factors, some participants pointed out that the lack of guidance and clear directions on how to complete the e-portfolio and what to write in it, resulted in them making inauthentic submissions. They expressed problems in terms of their own learning-needs assessment that eventually impacted on the perceived utility of the feedback for personal development:

> *The parts on guidance and discussion are not enough […] the thing is, if you organize the things on your own, the breadth and the depth of the feedback will be limited. Sometimes you need to have discussions with your peers and educators*

[…] So I think, if it's a small group discussion, probably the teacher could do a more detailed guidance…probably the students would get more. (PGY#5)

The issue of superficial feedback, or generic feedback, was further discussed and linked to participants' relative engagement with the patient cases they encounter. Thus, feedback was directly related to their own input whereby brief case reports received brief feedback. Some participants related this to their engagement with the clinical setting, whereas others related it to the relative importance individual PGYs placed on the e-portfolio process itself:

It goes back to the point. Not every division has many cases to write. If there were a case really worth of discussion, then the teacher's feedback would also be richer. (PGY#17)

Of course, it is related to whether you write your e-portfolio seriously. If the teacher found it seriously written, then he would spend some time to provide feedback. (PGY#16)

Finally, emotional aspects of receiving feedback were also highlighted as a factor that inhibited participants from seeking out or reading their feedback. This emotional aspect also included how participants might perceive the feedback providers according to the type of feedback received:

I almost never see it [the feedback from the supervisor]! Because I think that after seeing it, you would develop a stereotype about the teacher […] then suppose he gives you a high score, you would feel this teacher is good. And if he gives you a low score, you would consider the teacher is not kind. (PGY#7)

Yes, it is embarrassed for us to say the clinical teacher's feedback is too short. That doesn't feel good. Therefore, I would rather not to look at it. (PGY#2)

Other participants (the minority) simply lacked internal motivation to seek feedback online. Reasons for this included going along with perceived social norms:

I have never seen the teacher's feedback (PGY#3)

I think no one would check the feedback in the e-portfolios. (PGY#13)

However, despite there being numerous inhibiting factors for participants' FSB, there were

also learner-focussed factors that were cited as facilitating feedback seeking. The value that participants placed on feedback was a key motivating factor for seeking feedback out. Thus, feedback was seen by some as being a *gift for learning*, something to be actively sought out and kept. Some participants talked about feedback within e-portfolios as being the most important part of the process, facilitating practice improvement:

> *If teachers give feedback based on our reports, I will have a different way of thinking about my future practice. Then, in some aspects, I would improve my clinical practice. I think 'this is good' […] of course the teacher's feedback should be saved. If we spend time writing up, we need to learn something out of it[…] I think teacher's feedback should be kept.* (PGY#16)

> *I would read the teacher's comments in the last part. I think that part is the most important*. (PGY#18)

The high value placed on feedback includes valuing their clinical teachers' experience, even if they felt there was a generational gap around how things are done now versus how they used to be done. Essentially it is around an openness to listen and learn from seniors:

> *The teacher's feedback to me is […] also […] you could see how the experienced teacher handled this part. Maybe our thinking is different from the way the teachers deal with things. At that time, it's not necessary about who is right or wrong but about how you can...you can integrate the practical experiences from different aspects and make further progress.* (PGY#19)

Sub-theme 2: *Teacher-focussed factors*

The issue of teachers' remembering comprised the main teacher-focussed inhibiting factor for FBS. Thus, some participants reported that they were unable to link feedback to their specific experiences if it was delayed. Indeed, they believed that when feedback was delayed, even their educators would have forgotten the event, resulting in the feedback being construed as overly generic and 'nonsense':

> *If the feedback was delayed, it became not so specific to my case report. I can't remember what happened to the case after I reported it. I don't think my clinical teacher remembered it either. Therefore, the report and feedback became nonsense.* (PGY#20)

The issue of forgetting on the part of the teacher also interacted with forgetting on the part of the trainee:

> *Sometimes my teacher forgets to give feedback, or is delayed in uploading feedback. I guess he is too busy in clinical loading. Several days later, I might also forget to check the feedback.* (PGY#2)

Not only did participants refer to the issue of their teacher remembering specific events, but they also questioned whether their clinical teachers could even remember specific students. When feedback is delayed from the face-to-face event, and delivered online at a later point, it is imperative that the teacher can match a face to a name as well as recall the event. Due to the number of PGYs who rotate through each department, and the generic nature of feedback received, some participants doubted the authenticity of what they read:

> *I have seen some. But the feedback I have seen is very generic, because I think that the teacher may not remember […] that many students. When he sees your name, he might not know […] he may not be able to link it [to the person]*. (PGY#14)

> *I am not sure if the teacher will read it carefully, because he also needs to lead many students, and he has patients, the work at the clinic, and some research and administration work […] I think it is difficult to ask every physician to read them [e-portfolios] carefully.* (PGY#6)

On the flipside, some participants reported that they not only received generic, nonsensical feedback, but they also received quality feedback. Quality includes teachers feeding back on specific cases reported (relevant feedback) which were used by participants both prospectively (reading feedback and changing practice) and retrospectively (reading feedback after encountering problems to seek solutions). Further, ego factors and value intertwined. For example, reading feedback promoted new thought and action, leading to a positive self-image:

> *Of course, actually it is not only limited in this part. When I have some clinical problems, I would check it up [the feedback] and do changes afterwards […] during the process of checking, you would find out some- some new things.* (PGY#5)

> *Some clinical teachers would give me feedback specific to the cases that I reported, such as the care quality report, or the ethical report. This kind of feedback always gives me new thoughts on how to manage the cases. In some way, I think it will*

change my way of doing practice in the future. I like to read this kind of feedback. (PGY#16)

Some participants also highlighted teachers' dedication to educating them. Educators taking feedback seriously, giving time to the trainees to improve, which further motivates trainees' positive FSB:

Then, my mentor happened to be [names doctor], on this aspect [feedback] he works really hard […] most of the teachers, when they are doing the e-portfolio, they just deal with it by writing two or three words. But [names doctor] takes it seriously. He gives feedback seriously […] It's helpful. It's helpful. (PGY#8)

Sub-theme 3: *Technology-focussed factors*

The existing technological infrastructure in use at the hospital, the e-portfolio's default template and functions, alongside the requirements for completion (i.e. all objective assessments and writing reports were compulsory) often discouraged trainees in finishing the task, or in them doing it properly. For example, the lack of technology infrastructure led participants to complete their submissions at home after work, causing time delays and difficulty in writing. Technology-focused factors affect the general engagement of PGY trainees with e-portfolio. They also affect the feedback system and seeking of feedback. These factors dovetail with earlier issues (inadequate submissions leading to inadequate feedback) resulting in a lack of engagement with the feedback process:

Firstly, the computers in the hospital are not always enough, and the interface is not intuitive to use. Because after you go home […] it's lagging and then […] (PGY#14)

Some participants also uttered their dissatisfaction with the lack of a reminder function to alert teachers and trainees to give and receive feedback. This interacted with the issue of teachers' heavy clinical workload:

I think a reminder mechanism could be set [for teachers], otherwise, [it will be] like last time [when] they did not review the e-portfolios for over six months. This is horrible. (PGY#2)

At the time, I did not check if the teacher gave feedback, because some doctors were busy, and they wouldn't give feedback that quickly. I am thinking […] when they

give it, maybe we could receive an email or something? (PGY#6)

Or maybe, after the teacher gives feedback, something could pop out when you log into the e-portfolio the next time to remind us that the teacher given some feedback, so we could go there and read it. Otherwise, we won't remember to click [...] We won't. We only click the place where we need to write. (PGY#15)

However, not everyone felt that the infrastructure was the issue: quite simply, if you want to learn, you will and if you don't want to lean, you won't – linking with the issue of learner-focussed factors:

So I said, it is a problem about people, because those who want to learn will learn for sure […] they will learn anyway […] for the people who don't want to learn […] they will not learn. It's a problem about people, nothing to do with the system! (PGY#13)

However, the fact that feedback takes place in an online space, rather than physically face-to-face, was considered to be a technology-focussed facilitating factor for FSB. Indeed, participants talked about feedback being mainly around their deficits, rather than for praise. Receiving negative information about one's practice is never easy, and even more so within an Eastern face-saving culture. Thus, the online nature of e-portfolios facilitates the necessary face-saving requirements, whist enabling participants to learn from mistakes:

Except when I have something that I really […] for example, I don't want to […] I felt embarrassed to discuss it [for feedback] with the teacher in person, so I would put it there in words. (PGY#13)

I think it is not bad to have feedback in e-portfolio. After all, we are all working at the same place. It would be embarrassing to tell us directly what was wrong. Because I maybe follow orders from other staff, one could lose his face to hear negative feedback. However, we need to know what was wrong. To write it in e-portfolio is a good idea to avoid losing face. (PGY#20)

Sub-theme 4: *Process-focussed factors*

The process of the e-portfolio itself, including the timing and frequency of feedback, appeared to affect participants' FSB negatively (we have no data regarding positive aspects

for this sub-theme). Trainees highlighted how they are expected to reflect on the cases they experience, obtaining written feedback from their teacher/mentor via the e-portfolio. However, in objective assessments, the clinical teacher often provides immediate feedback directly following the presentation of a clinical case typically by arranging discussions and teaching at the patients' bedside. The repetition of this feedback exercise was a key factor in participants' decreased e-portfolios FSB:

> *Yes! [the] clinical teacher has given me a paper form feedback after our CbD* [case-based discussion*], the feedback in the e-portfolio appears to be redundant. I didn't look at that. […] Yeah- yeah- yeah- yeah! [...] because when you have individual meetings with your teacher, you have already submitted a form.* (PGY#1)

Indeed, some participants talked about how such doubling up of feedback resulted in superficial engagement on both sides:

> *Well after the writing, you just review the situation! He (the teacher) just re-reads [it…] and [talks about] any problems in-between [written feedback]*. (PGY#15)

The frequency with which participants are required to fill in their e-portfolios appears to impact negatively on trainees' FSB. Many participants asserted that feedback lacks utility when it is provided too often:

> *I think the frequency could be every 6 months or every year […] you only have that picture for your personal plan, and writing it every month won't change something. Actually, I think it is a bit too frequent.* (PGY#3)

Further, this frequency increased their already high clinical workload resulting in both an impediment to using the e-portfolio in the first place (for both participants and their teachers), as well as the additional work resulting from the e-portfolio feedback (i.e. being required to act on it).

> *This [acting on it] might not be possible, because we are very busy. If I have 20 patients for that day, then I won't do any writing. I don't even have time to finish my stuff.* (PGY#9)

> *Monthly reports are better. We can write a more detailed reflection. Clinical teachers can then receive meaningful reports and give proper feedback. The workload will not*

be too heavy […] when I think about the loading, I don't want to see the feedback. (PGY#12)

Discussion

Our findings highlight the complexity of aspects affecting FSBs that include individual, social, technological and organizational factors working as catalysts or inhibitors in congruence with cost-value perceptions of individuals.[24] That FSB is influenced by the perceived utility of that feedback, albeit for a variety of different reasons, resonates with other research that highlights how learners' FSB motivations focuses on performance improvement:[11,24] if the learner anticipates that the feedback will be worthless, FSB will be low. So when learners believe that the submissions on which the feedback is based lacks authenticity, arrives too late, or is highly generic, FSB motivation reduces. But when feedback is considered relevant and delivered by dedicated educators, high FSB motivation is sustained. This finding links with research that points to learners' relationships with their seniors (including expertise and trustworthiness) as being a key aspect underlying FSB and subsequent feedback efficacy.[24-26] Other learner-centred findings such as perceived social norms (i.e. no one else seeks feedback) and the strategic use of feedback (i.e. prospectively and retrospectively) appear to be quite novel in the FSB literature. This might be due to the context in which we have examined FSB: although feedback utility has been explored, it has not considered the inadequacy of the work on which the feedback is focused.

In our study, poor user interface, slow connectivity and a lack of reminders interrelated with participants' low FSB. Higher FSB is associated with the online nature of the e-portfolio and how it facilitates learners' face-saving. This is particularly important within the setting of our study – Taiwan – where face-saving is of utmost importance culturally. This finding resonates with other research undertaken in an Eastern culture with management students[3], with face-saving being considered a value within a cost-value model of FSB.[24] However, it should be noted that this face-saving benefit is not specific to Eastern cultures and manifests itself globally, albeit to a different extent.

Finally, we turn to organisational-related factors for FSB. When feedback is too late, particularly if it perceived as already having been received in a face-to-face setting in the interim, FSB is low. Furthermore, high frequency of feedback interacts with learners' high workload leading to a reduction in FSB. Although timing and frequency of feedback has been examined in the medical education literature, previous studies concentrated on feedback

efficacy, rather than its impact on FSB.[27] As such, this is a unique finding that can inform curricula development above and beyond the e-portfolio setting within which a study sits.

As with all studies, our research has limitations. Firstly, the data has been collected at a single institution in a single country so caution must be taken for the transferability of our findings. For example, as we have highlighted, the face-saving effect might be exaggerated within a Taiwanese culture. Secondly, we have used a qualitative individual interview method. Such face-to-face data collection might motivate participants to present themselves positively. We are therefore careful not to quantify our data, and make no claims regarding the relative importance of factors and the magnitude of their influence. However, our study has strengths. The setting in which it was conducted is the largest teaching hospital in Taiwan, we have a relatively large participant group and have used theory to facilitate the transferability of findings within a medical education context.

Our study has implications for educational practice. Providing learners with information on how to address their learning needs, thus facilitating the relevance of their reflective writing, could result in higher levels of FSB. Faculty development focusing on the provision of relevant, focused and high-quality feedback, is recommended. We also advise e-portfolio developers to work with students and educators when developing their user systems. Finally, the implementation of an e-portfolio should be considered in the wider context of both learners' and teachers' existing workload and opportunities for face-to-face feedback to ensure that the timing and frequency of feedback does not impede learners' FSB or create additional work for busy teachers and their trainees.

Our research also highlights the need for further work in terms of researching learners' FSB within healthcare settings. In an era in which feedback studies are prevalent, too much attention has been placed on the efficacy and the delivery of the feedback itself, rather than learners FSB, which is assumed to occur. However, this is not always the case. Without fully understanding the relative factors that facilitate and impede learners' FSB across a range of learning situations, the goals of feedback in healthcare education cannot be fully achieved.

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Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

No. Item	Guide questions/description	Response / Reported on Page #
Domain 1: Research team and reflexivity		
Personal Characteristics		
1. Interviewer/facilitator	Which author/s conducted the interview or focus group?	***See 'data collection' in Methods (page 9)***
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	***See title page (page 1)***
3. Occupation	What was their occupation at the time of the study?	***See title page (page 1)*** REN-HUEI FU is general practitioner at Chung Gang Memorial Hospital, Department of Neonatology; medical educator at Chung Gang Medical Education Research Centre (CG-MERC), Linkou, Taiwan. CHIAO-CHIN CHIANG is a Neonatology nursing practitioner of Chang Gung Memorial Hospital. PENG-WEI HSU is an Assistant Professor of Neuro-surgery and previous physician educator of CG-MERC, Chang Gung Memorial Hospital, Linkou, Taiwan. YU-HSUEH CHO is a Master of Chinese Medicine and researcher of the CG-MERC, Chang Gung Memorial Hospital, Linkou, Taiwan. QUATTRI FRAN, PhD, is a linguist and Post-Doctoral Researcher at the CG-MERC, Chang Gung Memorial Hospital, Linkou, Taiwan. MONROUXE LYNN, PhD, is a cognitive psychologist and Director of CG-MERC, Chang Gung Memorial Hospital, Linkou, Taiwan.
4. Gender	Was the researcher male or female?	**KHF, PWH:** Male **LVM, FQ, YHC, CCC:** Female
5. Experience and training	What experience or training did the researcher have?	**LVM** has vast experience of conducting qualitative research and analysis (over 15 years each). **FQ** has previous experience in qualitative research and analysis. **KHF** has previous experience in research but not qualitative **CCC** had **YHC** had LVM supported the team throughout the analysis, coding and writing process.
Relationship with participants		The interviewer, **YHC**, and **LVM** and **FQ** had no prior relationship with the students

		KHF (who was not present during interviews) had a role in developing the e-portfolio
6. Relationship established	Was a relationship established prior to study commencement?	***See 'Design' in Methods (page 9)***
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	***See Data Collection section in Methods (page 10)***
8. Interviewer characteristics	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	***Described on page 9***
Domain 2: study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	***See 'Design' in Methods (page 9).*** We used a qualitative interview design, we explain our analytical process.
Participant selection		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	***See 'recruitment' in Methods (page 9).*** Participants were self-selected using purposive sampling. All participation was voluntary.
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	***See 'data collection' in Methods (page 9).***
12. Sample size	How many participants were in the study?	***See 'Participants' in Methods (page 9)*** "Participants comprised n=71 PGY1 (60% of cohort; 66% male)"
13. Non-participation	How many people refused to participate or dropped out? Reasons?	Participation was voluntary and participants were not considered to take part until they participated in the interviews. No participants withdrew from the study after participating in interviews.
Setting		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	***See 'Data collection' in Methods (page 9)*** "Interviews were conducted in a quiet room at participants' convenience." –
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	***No***
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	***See 'Participants' (page 9)*** The gender has been reported.
Data collection		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	***See 'Data collection' in Methods (page 9)***
18. Repeat interviews	Were repeat inter views carried out? If yes, how many?	***No***
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	***See 'Data collection' in Methods (page 9)***

20. Field notes	Were field notes made during and/or after the interview or focus group?	***None made.***
21. Duration	What was the duration of the interviews or focus group?	**Individual semi-structural interview, 20-30 min each, "procedure" page 11**
22. Data saturation	Was data saturation discussed?	We do not report this as we do not consider this to appropriate for our research position (Varpio L, Ajjawi R, Monrouxe LV, O'Brien B, Rees CE (2017) Shedding the cobra effect: problematising thematic emergence, triangulation, saturation and member checking. Medical Education. 51(1)40-50.)
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	We do not report this as we do not consider this to appropriate for our research position (Varpio L, Ajjawi R, Monrouxe LV, O'Brien B, Rees CE (2017) Shedding the cobra effect: problematising thematic emergence, triangulation, saturation and member checking. Medical Education. 51(1)40-50.)
Domain 3: analysis and findings		
Data analysis		
24. Number of data coders	How many data coders coded the data?	***See 'Data analysis' in Methods (page 10)***
25. Description of the coding tree	Did authors provide a description of the coding tree?	***See Results Section, Table 1 (page 10)***
26. Derivation of themes	Were themes identified in advance or derived from the data?	***See 'Data analysis' in Methods (page 9)*** Themes were inductively and deductively developed.
27. Software	What software, if applicable, was used to manage the data?	***See 'Data analysis' in Methods (page 9)***
28. Participant checking	Did participants provide feedback on the findings?	We do not report this as we do not consider this to appropriate for our research position (Varpio L, Ajjawi R, Monrouxe LV, O'Brien B, Rees CE (2017) Shedding the cobra effect: problematising thematic emergence, triangulation, saturation and member checking. Medical Education. 51(1)40-50.)
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	***Yes***.
30. Data and findings consistent	Was there consistency between the data presented and the findings?	We have ensured consistency between the data presented and the findings of the study through thoroughly reviewing the manuscript.
31. Clarity of major themes	Were major themes clearly presented in the findings?	***See 'Results' (page 10-17)*** The results section is organized around the major themes of the study, which are described under specific headings.

32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	***See 'Results' (page 10-17)*** The results section includes discussion of major themes, and nuances within these were covered.

BMJ Open

"I did not check if the teacher gave feedback": A qualitative analysis of Taiwanese postgraduate trainees' talk around e-portfolio feedback-seeking behaviours

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"*I did not check if the teacher gave feedback*": A qualitative analysis of Taiwanese postgraduate trainees' talk around e-portfolio feedback-seeking behaviours

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RHF conceived the study. RHF and LVM designed the work. YHC contributed to the

acquisition of the data. All authors contributed to the analysis and interpretation of data. RHF, FQ and LVM drafted the initial manuscript. All authors revised the manuscript critically for important intellectual content. LVM and RHF substantially revised the paper. All authors gave their final comments and approval of the version to be published. LVM is the guarantor, agrees to be accountable for all aspects of the manuscript, has access to the data, made the final decision to submit and will ensure that any questions relating to the accuracy or integrity of any part of the manuscript are appropriately investigated and resolved.

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Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

Ethical Approval

The research was approved by the research ethics committee of Chang Gung Memorial Hospital.

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Transparency declaration

Lynn V Monrouxe (the manuscript's guarantor) affirms that the manuscript is an honest, accurate, and transparent account of the study being reported; no important aspects of the study have been omitted; and any discrepancies from the study as planned have been explained.

Patient consent

Not applicable.

Data sharing statement

The raw data for this research comprises audio-recordings of interviews. The principal investigator (R.H. Fu) has access to this specific data set, including interview transcripts, in addition to participant contact details and signed consent forms. All authors have access to anonymised data from this set. All data are securely stored in on password-protected and encrypted computers. Participants have not given their permission for data sharing outside the research group. Thus, no additional data is available.

Abstract

Objectives: Despite feedback being an extensively researched and essential component of teaching and learning, there is a paucity of research examining feedback within a medical education e-portfolio setting including feedback-seeking behaviours (FSBs). FSBs can be understood within a cost-value perspective. The objective of this research is to explore the factors that influence post-graduate year-one (PGY1) trainee doctors' FSBs via e-portfolios.

Setting: Post-graduate education provision in the largest teaching hospital in Taiwan.

Participants: Seventy-one PGY1s (66% male).

Methods: A qualitative semi-structured one-to-one interview method was adopted. Interviews were audio-recorded, transcribed verbatim, anonymized and checked for completeness. Data were analysed inductively via thematic Framework Analysis and deductively informed they FSB theory. The process comprised: data familiarization, identification of the themes, charting and data interpretation.

Results: Two main themes of FSB-related and e-portfolio-related were identified. We present the theme focussing on FSB here to which n=32 (22 males, 10 females) of the n=71 participants contributed meaningfully. Sub-themes include factors variously affecting PGY1s′ positive and negative FSBs via e-portfolios at the individual, process and technological levels. These factors include learner-related (internal values vs. social influence, forced reflection); teacher-related (committed educators vs. superficial feedback); technology-related (face-saving vs. lagging systems; inadequate user-interface); and process-related (delayed feedback, too frequent feedback) factors.

Conclusions: Our findings reveal the complexity of PGY1s' FSBs in an e-portfolio context and the interaction of numerous facilitating and inhibiting factors. Further research is required to understand the range of facilitating and inhibiting factors involved in healthcare learners' FSBs across different learning, social, institutional and national cultural settings.

ARTICLE SUMMARY

Strengths and limitations of this study

- Our qualitative approach has facilitated the exploration of feedback-seeking as an unexpected phenomenon within our study (i.e. as highlighted by participants during the interviews rather than being the main focus of the original study)
- The multi-cultural, multi-disciplinary make-up of the research team – including expertise in psychology, linguistics, medical education and medicine – facilitated a deeper understanding of both the process and the content of the data
- The use of current theoretical perspectives of feedback seeking nabled us to unpack the learner, teacher, technological and process-related factors impacting on trainees' willingness to seek out and utilise teachers' feedback within an e-portfolio setting that can be transferable outside the study context
- Although only n=32 participants meaningfully contributed to our findings. This is a substantial number for a qualitative study of this kind, considering the detailed information that each participant provided.
- The context of feedback seeking behaviours within e-portfolios in a Taiwanese teaching hospital is likely to have emphasized some of our findings, including the face-saving utility

Introduction

Feedback is an essential component of the teaching and learning process and has been extensively researched in this decade.[1] Giving learners feedback means letting them know, in a timely and on-going way, how they are progressing.[2,3] Indeed, during clinical placements, the provision of feedback is an integral part of the learning process, enriching students' learning experience.[3] Constructive feedback from educators enables learners to gain insight into their actions and consequences, and this allows both learners and teachers to successfully achieve personal and program-related objectives.[4]

Furthermore, research suggests that some forms of feedback (e.g., reinforcement, video/audio feedback, computer-assisted instructional feedback) can be more effective than others, with effective and regular feedback having the potential to reinforce good practice and motivate the learner toward the desired outcome.[5] However, feedback is a two-way process. Although a general complaint heard from students and trainees is often that "*I never receive any feedback*",[6] some clinical teachers believe that students and trainees often lack motivation for seeking feedback.[3,7] To investigate whether it is just a matter of motivation, our study focuses on trainee doctors' feedback-seeking behaviour (FSB) within e-portfolios.

Feedback-seeking behaviour

Feedback-seeking behaviour (FSB) has been defined as "[a] conscious devotion of effort towards determining the correctness and adequacy of behaviours for attaining values and states".[8] For this to happen, it requires both conscious effort and motivation to change.

A recent scoping review of the literature around feedback for learners in medical education failed to identify any studies on learners' FSB.[1] Indeed, although we identified a small number of papers on FSB within medical education, the vast majority of research was conducted in organisational contexts adopting existing FSB theories without challenging their validity.[9]

FSB seems to occur in two primary ways: requesting feedback from another (typically senior) colleague or observing others' behaviours.[10] In the case of an e-portfolio, however, the 'request' comes in the form of returning to the online forum and reading the feedback provided. Ashford and colleagues proposed that the cost and value of any given action are the primary determinants of FSB.[11] Nevertheless, a number of factors affect cost and value of actions. For example, one key perceived cost is *self-presentation*, including the potential embarrassment of revealing one's lack of knowledge, thereby drawing attention to personal

deficiencies. Other costs include *ego costs* (i.e., the risk of being the recipient of negative information), and *effort costs* (i.e., the risk of wasting energy and time with little return value).

Value is the perceived worth of FSB in learning new behaviours/skills to improve performance.[10] As such, the *expectancy* of this value has been shown to increase the frequency of FSB.[12] Furthermore, self-preservation is associated with value: through requesting feedback we can create or enhance a positive image of ourselves.[10] This theoretical work appears to transfer well into a medical education context. A qualitative study examining FSB in veterinary students during their clinical years found their FSB to be affected by perceived ego (e.g., feeling incompetent through negative feedback), image (e.g., the presence of peers) and costs and benefits (utility of feedback).[13]

Goal orientation theory (personal goal preferences in achievement situations) has also been used to understand influences on the feedback-seeking process and comprises two main orientations: *performance* and *learning* goal orientations.[10] *Performance goal orientation* focuses on demonstrating and validating one's competence by seeking favourable (and avoiding negative) judgments. Here individuals focus on the cost of feedback-seeking, leading to low FSB. *Learning goal orientation* emphasizes developing competence: increasing FSB to benefit their job performance and for self-enhancement.[10] Situational factors have been shown to have a strong impact on which orientation is used.[10]

Research in medical education has considered resident doctors' goal orientation around feedback-seeking.[14] A positive relationship between the value placed on feedback and FSB frequency was identified.[14] Additionally, the situational factor of having a supportive supervisor influenced residents' likelihood to place a high value on feedback and see fewer costs for FSB.[14] Furthermore, research with residents in Switzerland also supported the influence of situational factors on FSB: supervisors' promotion of feedback-seeking was the sole predictor of residents' FSB through inquiry and increased their learning goal orientation.[15] Finally, this situational factor was associated with lower ego-protection and impression management concerns.[15]

Other research in organizational and educational settings suggests that national culture can influence FSB.[3,7] Motives underlying FSB include: an *instrumental* motive (high FSB to facilitate personal goal achievement and develop behaviours); an *image-defense* motive (FSB is tied up with a wish to maintain a high social image); and an *ego-defense* motive (in an attempt to maintain one's ego individuals avoid seeking feedback or do so strategically)[7]. Individuals from Western and Eastern (particularly Chinese) cultures are thought to react

differently to such influences. Indeed, research with Chinese management students suggests that FSB is strongly related to the issue of face (i.e. the fear of losing face before others), resulting in FSB being low when others are present.[3]

Feedback via e-portfolios in medical education

Portfolios assess what a learner does when functioning independently in the clinical workplace and are designed to stimulate learning from experience.[16,17] In the postgraduate arena, portfolios can be used for a number of different, yet interrelated, purposes including: as a tool for training in which a collection of skills and competencies, alongside reflective comments on development, are held; as a reflective tool of personal development for promotion selection; and as a person development tool containing reflective valuations progress over time.[18] Portfolios in postgraduate education tend to be mandatory. To serve the purpose of education, it is suggested that portfolios should contain evidence of how learners fulfil tasks and how their competence is progressing. Nowadays, portfolios are mostly digital (e-portfolios), with content that can be prescribed or left to the learners' discretion. Despite variations, their role is to record work undertaken, feedback received, progress made and plans for improvement.[19] In medical education, the content of trainees' e-portfolios may include quantitative assessments (such as the Mini-Clinical Evaluation Exercise, Direct Observation of Procedural Skills, Case based Discussion, and 360 degree evaluation), reflective writing (such as medical ethics and legislation report, health care quality report, and personal development report), and Evidence-Based Medicine report. Clinical teachers are required to assess the trainee and provide appropriate feedback on their assessment and reports in their e-portfolios. The utilization of e-portfolios has the potential to change the nature of learning environments and the ways in which trainee learning is promoted through different modes of learning.[20] As such, the work collected in the e-portfolio provides material for the trainee to review their learning and can be used as a basis for future assessment.

Feedback is a key element of any e-portfolio: feedback information is needed so the learner can reflect and formulate their future plans and develop learning objectives in order to improve their performance and competencies.[17] Furthermore, in the age of competency-based education, continuous, detailed and targeted feedback is essential.[21] Although staff and trainees do not always share a common understanding of the role of feedback in supporting learning,[20] evidence suggests that well-implemented portfolios are effective and practical, increase personal responsibility for learning and support professional development and so engaging in feedback via e-portfolios is of utmost importance.[22] On a positive note, feedback

via e-portfolios has been shown to encourage reflection among users.[22] On the downside, scepticism about the purpose of the e-portfolio and lack of time for completion are also reported.[23] However, despite the plethora of research that has been undertaken examining FSB in an organizational setting,[24] and the potential of e-portfolios for supporting the feedback loop, to our knowledge there is no research to date that has examined FSB in the context of e-portfolios. This is an obvious omission given the often-compulsory nature of e-portfolios in the post-graduate setting and the importance of feedback for the development of professionalism and competencies in the clinical setting. Indeed, given the key role of feedback in the learning process, understanding why learners sometimes fail to take the first step and seek out their feedback is an important, yet under-studied issue in the e-portfolio context.[25]

Aim and research question

The aim of our research is to understand postgraduate year one medical trainees' (PGY1s') feedback seeking behaviours in the context of an e-portfolio, which, for the purposes of this study, we define as 'motivations and behaviours towards looking for, reading, or mentally engaging with feedback delivered via an online portfolio'. Specifically we wish to answer the following research question (RQ):

> RQ: What are the factors that influence postgraduate year one medical trainees' feedback seeking behaviours within an e-portfolio context?

Methods

Study context

The study was conducted at the largest teaching hospital in Taiwan. PGY1 trainees are in the transitional period between medical student and clinical physician. They are licensed physicians who receive a training program as they transition from medical students to specialty residents. The PGY1 training program of general medicine was implemented by the Taiwanese government for professional training in general practice in 2011. E-portfolios were introduced in 2013, and gradually substituted paper-based portfolios. The portfolio in this setting is a collection of evidence of the PGY1s' learning experience during their training. It comprises a default template for several assessment and evaluation criteria including a quantitative assessment (e.g. Mini-Clinical Evaluation Exercise (Mini-CEX), Direct Observation of Procedural Skills (DOPS), Case-based Discussion (CbD)) and qualitative,

reflective writing sections (e.g. Medical Ethics and Legislation Report, Medical Care Quality Report and Personal Development Report). According to Taiwanese regulations for e-portfolios, trainees are expected to fill the e-portfolios numerous times over the course of their training (14 objective assessments and 22 reflective writing reports during the PGY1 training). In terms of the objective assessment (e.g. Mini-CEX, DOPS, and CbD), clinical teachers are required to evaluate the performance of the PGY1 trainee and provide them with a score and feedback immediately following their bedside teaching. Clinical teachers are required to upload feedback to the trainees' e-portfolio afterwards. For the reflective writing reports, clinical teachers provide feedback about trainees' reports following each submission. Thus, PGY1s receive feedback for different assessments and from different rotations during the same training period.

Patient involvement

No patients were involved in the design or instigation of this study.

Design

A qualitative study with one-to-one, semi-structured interviews was employed to explore the perception and experience of PGY1 trainees about their engagement with clinical teachers' feedback provided in their e-portfolio. Following the piloting of the interview questions (n=5 PGY1) only slight changes were made. Several questions were asked in the interview, including: There are numerous reports and assessments in the e-portfolio which are followed by clinical teachers' feedback, did you read them all? If so, why? If not, why not? Do you think you have received appropriate feedback in your e-portfolio? Is there any difference between paper-based, e-portfolio and face-to-face feedback? Do you find it helpful to receive clinical teachers' feedback through the e-portfolio? Does feedback affect you in any aspect of your clinical practice? Do you change your behaviour or advance your knowledge following feedback?

Participants

Following ethical approval, all 118 (65% male) PGY1 trainees from the 2014 cohort were approached to participate. Participants were self-selected using convenience sampling. When the researcher contacted the trainees, a brief introduction including the purposes and methodology of the research project was given to the trainees. They were told that the research was being led by a physician educator: there were nine physician educators in the hospital at the time. The trainees were assured that the interview would be anonymized after transcription. The research team members only analyzed anonymized data. The researcher

that performed the interview did not know any of the trainees before they met. All participation was voluntary. Informed consent was obtained. Participants comprised n=71 PGY1 (60% of cohort; 66% male) trainees. A larger participation group than originally intended was recruited due to the fact that a number of participants' interviews were brief as they had not accessed the feedback section of their e-portfolio (the first question of the interview). Given that our original focus to was to examine engagement with feedback and differences between paper and electronic feedback we continued to accept participants into the study until we felt that sufficient data had been obtained to address these issues.[26] The interviews were arranged within the last three months of their training courses so that all participants were familiar with the e-portfolio system.

Procedure

A researcher, who was a previous medical technologist (YHC) external to the hospital with interview experience, conducted all interviews. Interviews were conducted in a quiet room at participants' convenience. Interviews were audio-recorded, transcribed verbatim, anonymized and checked for completeness. Each interview lasted around 20-30 minutes and took place in a private room at the hospital.

Team reflexivity

The research team comprised a multilingual (Mandarin, Italian and English), multi-professional (clinicians a linguist, and a psychologist) and multicultural (Taiwanese, Italian and English) group. Although the non-Taiwanese members of the research team had some proficiency in Mandarin, some of the data needed to be translated into English so that LVM could fully participate in the data analysis process. Discussions around the data were held in both Mandarin and English, and translational and cultural issues were addressed. Discussion around team members' approaches to the data, and their relative closeness to the focus of the research (e-portfolio, postgraduate participants) were held as data were analysed.

Data analysis

Data were analysed using inductive thematic Framework Analysis,[27] comprising: data familiarization, identification of the themes, charting and data interpretation. Additionally, as cost-value and goal orientation theories were known to the researchers, it is acknowledged that they also influenced data analysis deductively (although data were not specifically mapped to these theories). Four researchers (RH, YHC, CCC, PWH) read the transcripts, distributing them among each other so that all transcripts were read by at least two people. Following this, two researchers (FQ, LVM) joined the team to further develop the thematic focus of FSB. Data were translated from Mandarin to English by the CG-MERC official

translator (see Acknowledgements). The researchers came together several times to discuss the coding framework development. The framework was written as a document to facilitate coding consistency and analytical development. Data were coded by one person. As the data were coded, further developments of the themes were discussed with the wider team and incorporated into the final analysis in the framework document.

Results

Two main themes were identified, of which one is FSB-related and the other one is specifically related to the e-portfolio in use (i.e. comparison between e-portfolio and paper-based portfolios). This research reports on the theme of "Inhibiting and facilitating factors around FSB", which comprises four sub-themes (see Table 1). Thirty-two (22 males and 10 females) of the 71 participants contributed meaningfully to this theme, presented here. The remaining n=39 participants mainly focussed their talk around the e-portfolio in general (e.g. their engagement with it and with reflection) and comparisons between online and paper-based portfolios: and while responding to the direct questions around feedback seeking, they did so superficially and therefore fail to contribute meaningfully to the issue of feedback-seeking behaviours.

Table 1: Learner, teacher, technology and process-related factors for trainees' feedback-seeking behaviours

	Inhibiting factors	**Facilitating factors**
1: Learner-focussed	Poor learning-needs assessment (*what to have feedback on*) Emotional reactions (*about teachers*)	Value placed on feedback (*feedback as a gift to be saved*) Value placed on teachers (*learning from seniors*)
2: Teacher-focussed	Delayed feedback (*irrelevant*) Generic feedback (*irrelevant*)	Relevant feedback (*high utility; facilitates self-regulation*) Dedication to teaching (*high utility; trainee respect*)
3: Technology-focussed	Poor user-interface (*time-wasting; irrelevant material upload*) Lack of reminders (*forgetting to check*)	Online versus face-to-face (*face-saving utility*)
4: Process-focussed	Timing (*repetition*) Frequency (*workload*)	None mentioned

Inhibiting and facilitating factors around trainees' feedback seeking behaviours (FSB)

Participants discussed their engagement with feedback in terms of if and when they sought it within the e-portfolio. They discussed the various factors that influenced their engagement

that we report as sub-themes: (1) learner-focussed factors; (2) teacher-focussed factors; (3) technology-focussed factors; and (4) process-focussed factors.

Sub-theme 1: learner-focussed factors

This sub-theme focuses on the inhibiting and facilitating learner-related factors to participants' FSB. In terms of inhibiting factors, some participants pointed out that the lack of guidance and clear directions on how to complete the e-portfolio and what to write in it, resulted in them making inauthentic submissions. They expressed problems in terms of their own learning-needs assessment that eventually impacted on the perceived utility of the feedback for personal development, further inhibiting feedback seeking. The following participant highlighted this issue, calling for more initial guidance during their face-to-face meetings about how to complete the e-portfolio to make the subsequent feedback more relevant (so facilitating feedback seeking motivation):

> *The parts on guidance and discussion are not enough […] the thing is, if you organize the things on your own, the breadth and the depth of the feedback will be limited. Sometimes you need to have discussions with your peers and educators […] So I think, if it's a small group discussion, probably the teacher could do a more detailed guidance…probably the students would get more.* (PGY#5)

The issue of superficial feedback, or generic feedback, was further discussed and linked to participants' relative engagement with feedback seeking around the patient cases they encountered. Thus, feedback was directly related to their own input whereby brief case reports received brief feedback. Some participants related this to their engagement with the clinical setting, whereas others related it to the relative importance individual PGYs placed on the e-portfolio process itself: a lack of engagement with the e-portfolio resulted in feedback that was of little importance and therefore ignored whereas high levels of engagement motivated feedback seeking:

> *It goes back to the point. Not every division has many cases to write. If there were a case really worth of discussion, then the teacher's feedback would also be richer.* (PGY#17)

> *Of course, it [feedback seeking] is related to whether you write your e-portfolio seriously. If the teacher found it seriously written, then he would spend some time to provide feedback.* (PGY#16)

Finally, emotional aspects of receiving feedback were also highlighted as a factor that inhibited participants from seeking out or reading their feedback. This emotional aspect also included how participants might perceive the feedback providers according to the type of feedback received:

> *I almost never see it [the feedback from the supervisor]! Because I think that after seeing it, you would develop a stereotype about the teacher […] then suppose he gives you a high score, you would feel this teacher is good. And if he gives you a low score, you would consider the teacher is not kind.* (PGY#7)

> *Yes, it is embarrassed for us to say the clinical teacher's feedback is too short. That doesn't feel good. Therefore, I would rather not to look at it.* (PGY#2)

Other participants (the minority) simply lacked internal motivation to seek feedback online. Reasons for this included going along with perceived social norms [i.e. others do not do it so they also do not]:

> *I have never seen the teacher's feedback* (PGY#3)
> *I think no one would check the feedback in the e-portfolios*. (PGY#13)

However, despite there being numerous inhibiting factors for participants' FSB, there were also learner-focussed factors that were cited as facilitating feedback seeking. The value that participants placed on feedback was a key motivating factor for seeking feedback out. Thus, feedback was seen by some as being a *gift for learning*, something to be actively sought out and kept. Some participants talked about feedback within e-portfolios as being the most important part of the process, facilitating practice improvement and therefore something to be sought out and even kept:

> *If teachers give feedback based on our reports, I will have a different way of thinking about my future practice. Then, in some aspects, I would improve my clinical practice. I think 'this is good' […] of course the teacher's feedback should be saved. If we spend time writing up, we need to learn something out of it[…] I think teacher's feedback should be kept.* (PGY#16)

> *I would read the teacher's comments in the last part. I think that part is the most important*. (PGY#18)

The high value placed on feedback includes valuing their clinical teachers' experience, even if they felt there was a generational gap around how things are done now versus how they used to be done. Essentially it is around an openness to listen and learn from seniors, and when that openness is present, feedback is sought and valued:

> *The teacher's feedback to me is […] also […] you could see how the experienced teacher handled this part. Maybe our thinking is different from the way the teachers deal with things. At that time, it's not necessary about who is right or wrong but about how you can...you can integrate the practical experiences from different aspects and make further progress.* (PGY#19)

Sub-theme 2: *Teacher-focussed factors*

The issue of teachers' remembering comprised the main teacher-focussed inhibiting factor for FBS. Thus, some participants reported that they were unable to link feedback to their specific experiences if it was delayed resulting in them disengaging with feedback seeking after an initial period of engagement. Indeed, they believed that when feedback was delayed, even their educators would have forgotten the event, resulting in the feedback being construed as overly generic and 'nonsense', further inhibiting their feedback seeking motivation:

> *If the feedback was delayed, it became not so specific to my case report. I can't remember what happened to the case after I reported it. I don't think my clinical teacher remembered it either. Therefore, the report and feedback became nonsense.* (PGY#20)

The issue of forgetting on the part of the teacher also interacted with forgetting on the part of the trainee:

> *Sometimes my teacher forgets to give feedback, or is delayed in uploading feedback. I guess he is too busy in clinical loading. Several days later, I might also forget to check the feedback.* (PGY#2)

> *I haven't seen it yet. I tried clicking before, but … er, it seems that most of them [the teachers] haven't given [the feedback], so I didn't check particularly afterwards.* (PGY#21)

Not only did participants refer to the issue of their teacher remembering specific events, but

they also questioned whether their clinical teachers could even remember specific students. When feedback is delayed from the face-to-face event, and delivered online at a later point, it is imperative that the teacher can match a face to a name as well as recall the event. Due to the number of PGYs who rotate through each department, and the generic nature of feedback received, some participants doubted the authenticity of what they read. Inauthentic feedback inhibits later feedback seeking motivation:

> *I have seen some. But the feedback I have seen is very generic, because I think that the teacher may not remember […] that many students. When he sees your name, he might not know […] he may not be able to link it [to the person]*. (PGY#14)

> *I am not sure if the teacher will read it carefully, because he also needs to lead many students, and he has patients, the work at the clinic, and some research and administration work […] I think it is difficult to ask every physician to read them [e-portfolios] carefully.* (PGY#6)

On the flipside, some participants reported that they not only received generic, nonsensical feedback, but they also received quality feedback. Quality includes teachers feeding back on specific cases reported (relevant feedback) which were used by participants both prospectively (reading feedback and changing practice) and retrospectively (reading feedback after encountering problems to seek solutions). Further, ego factors and value intertwined. For example, reading feedback promoted new thought and action, leading to a positive self-image and therefore high levels of FSB engagement:

> *Of course, actually it is not only limited in this part. When I have some clinical problems, I would check it up [the feedback] and do changes afterwards […] during the process of checking, you would find out some- some new things.* (PGY#5)

> *Some clinical teachers would give me feedback specific to the cases that I reported, such as the care quality report, or the ethical report. This kind of feedback always gives me new thoughts on how to manage the cases. In some way, I think it will change my way of doing practice in the future. I like to read this kind of feedback*. (PGY#16)

Some participants also highlighted teachers' dedication to educating them. Educators taking feedback seriously, giving time to the trainees to improve, which further motivates trainees'

positive FSB:

> *Then, my mentor happened to be [names doctor], on this aspect [feedback] he works really hard […] most of the teachers, when they are doing the e-portfolio, they just deal with it by writing two or three words. But [names doctor] takes it seriously. He gives feedback seriously […] It's helpful. It's helpful…maybe sometimes I would take a look when I feel interested.* (PGY#8)

Sub-theme 3: *Technology-focussed factors*

The existing technological infrastructure in use at the hospital, the e-portfolio's default template and functions, alongside the requirements for completion (i.e. all objective assessments and writing reports were compulsory) often discouraged trainees in finishing the task, or in them doing it properly. For example, the lack of technology infrastructure led participants to complete their submissions at home after work, causing time delays and difficulty in writing. Technology-focused factors affect the general engagement of PGY trainees with e-portfolio. They also affect the feedback system and seeking of feedback. These factors dovetail with earlier issues (inadequate submissions leading to inadequate feedback) resulting in a lack of engagement with the feedback process:

> *Because if it's paper, you can bring it with you anywhere. And you can immediately see the feedback the teacher gave to you. If it's e-portfolio, if you are in the hospital, basically you don't have time to use the computer…firstly, the computers in the hospital are not always enough, and the interface is not intuitive to use. Because after you go home […] it's lagging and then [you don't check]* (PGY#14)

Some participants also uttered their dissatisfaction with the lack of a reminder function to alert teachers and trainees to give and receive feedback. This interacted with the issue of teachers' heavy clinical workload. As such, after checking for feedback a number of times, participants reported giving up or forgetting to check:

> *I think a reminder mechanism could be set [for teachers], otherwise, [it will be] like last time [when] they did not review the e-portfolios for over six months. This is horrible.* (PGY#2)

> *At the time, I did not check if the teacher gave feedback, because some doctors were busy, and they wouldn't give feedback that quickly. I am thinking […] when they give it, maybe we could receive an email or something?* (PGY#6)

Or maybe, after the teacher gives feedback, something could pop out when you log into the e-portfolio the next time to remind us that the teacher given some feedback, so we could go there and read it. Otherwise, we won't remember to click [...] We won't. We only click the place where we need to write. (PGY#15)

However, not everyone felt that the infrastructure was the issue: quite simply, if you want to learn, you will and if you don't want to learn, you won't – linking with the issue of learner-focussed factors:

So I said, it is a problem about people, because those who want to learn will learn for sure […] they will learn anyway […] for the people who don't want to learn […] they will not learn. It's a problem about people, nothing to do with the system! (PGY#13)

However, the fact that feedback takes place in an online space, rather than physically face-to-face, was considered to be a technology-focussed facilitating factor for FSB. Indeed, participants talked about feedback being mainly around their deficits, rather than for praise which inhibited their desire to seek it out. Receiving negative information about one's practice is never easy, and even more so within an Eastern face-saving culture. Thus, the online nature of e-portfolios facilitates the necessary face-saving requirements around seeking out feedback, whilst enabling participants to learn from mistakes:

Except when I have something that I really […] for example, I don't want to […] I felt embarrassed to discuss it [for feedback] with the teacher in person, so I would put it there in words. (PGY#13)

I think it is not bad to have feedback in e-portfolio. After all, we are all working at the same place. It would be embarrassing to tell us directly what was wrong. Because I maybe follow orders from other staff, one could lose his face to hear negative feedback. However, we need to know what was wrong. To write it in e-portfolio is a good idea to avoid losing face. (PGY#20)

Sub-theme 4: *Process-focussed factors*

The process of the e-portfolio itself, including the timing and frequency of feedback, appeared to affect participants' FSB negatively (we have no data regarding positive aspects

for this sub-theme). Trainees highlighted how they are expected to reflect on the cases they experience, obtaining written feedback from their teacher/mentor via the e-portfolio. However, in objective assessments, the clinical teacher often provides immediate feedback directly following the presentation of a clinical case typically by arranging discussions and teaching at the patients' bedside. The repetition of this feedback exercise was a key factor in participants' decreased e-portfolios FSB:

> *Yes! [the] clinical teacher has given me a paper form feedback after our CbD* [case-based discussion*], the feedback in the e-portfolio appears to be redundant. I didn't look at that. […] Yeah- yeah- yeah- yeah! [...] because when you have individual meetings with your teacher, you have already submitted a form.* (PGY#1)
>
> *I haven't seen it yet. Seriously. Because in the clinical setting, he would directly give me the feedback* (PGY#13)

Indeed, some participants talked about how such doubling up of feedback resulted in superficial engagement on both sides:

> *Well after the writing, you just review the situation! He (the teacher) just re-reads [it…] and [talks about] any problems in-between [written feedback]*. (PGY#15)

The frequency with which participants are required to fill in their e-portfolios appears to impact negatively on trainees' FSB. Many participants asserted that feedback lacks utility when it is provided too often:

> *I think the frequency could be every 6 months or every year […] you only have that picture for your personal plan, and writing it every month won't change something. Actually, I think it is a bit too frequent.* (PGY#3)

Further, this frequency increased their already high clinical workload resulting in both an impediment to using the e-portfolio in the first place (for both participants and their teachers), as well as the additional work resulting from the e-portfolio feedback (i.e. being required to act on it) This translated into a reluctance for some to seek out their feedback as engaging with it impacts on their workload.

> *This [acting on it] might not be possible, because we are very busy. If I have 20 patients for that day, then I won't do any writing. I don't even have time to finish my stuff.* (PGY#9)

Monthly reports are better. We can write a more detailed reflection. Clinical teachers can then receive meaningful reports and give proper feedback. The workload will not be too heavy […] when I think about the loading, I don't want to see the feedback. (PGY#12)

Discussion

Our findings highlight the complexity of aspects affecting FSBs that include individual, social, technological and organizational factors working as catalysts or inhibitors in congruence with cost-value perceptions of individuals.[28] That FSB is influenced by the perceived utility of that feedback, albeit for a variety of different reasons, resonates with other research that highlights how learners' FSB motivations focuses on performance improvement:[11,28] if the learner anticipates that the feedback will be worthless, FSB will be low. So when learners believe that the submissions on which the feedback is based lacks authenticity, arrives too late, or is highly generic, FSB motivation reduces. But when feedback is considered relevant and delivered by dedicated educators, high FSB motivation is sustained. This finding links with research that points to learners' relationships with their seniors (including expertise and trustworthiness) as being a key aspect underlying FSB and subsequent feedback efficacy.[28-30] Other learner-centred findings such as perceived social norms (i.e. no one else seeks feedback) and the strategic use of feedback (i.e. prospectively and retrospectively) appear to be quite novel in the FSB literature, although a consideration of the organisational culture and its impact on feedback giving and expectations has been acknowledged.[25] This might be due to the context in which we have examined FSB: although feedback utility has been explored, it has not considered the inadequacy of the work on which the feedback is focused.

In our study, poor user interface, slow connectivity and a lack of reminders interrelated with participants' low FSB. Higher FSB is associated with the online nature of the e-portfolio and how it facilitates learners' face-saving. This is particularly important within the setting of our study – Taiwan – where face-saving is of utmost importance culturally. This finding resonates with other research undertaken in an Eastern culture with management students[3], with face-saving being considered a value within a cost-value model of FSB.[24] However, it should be noted that this face-saving benefit is not specific to Eastern cultures and manifests itself globally, albeit to a different extent. For example, Ginsburg et al.,[31]

analysed face-saving strategies in written feedback for low- and high- rated Canadian PGY1 doctors. They found that feedback providers used more terms addressing PGY1s' positive face in the high-rated group (e.g. 'absolutely outstanding', 'a pleasure to work with') and more hedges when providing feedback for the low-rated group ('could have', 'a little more', 'fairly'). Furthermore, feedback providers also used hedges to 'shield' themselves ('probably', 'perhaps') thereby protecting their own face, particularly in the context of providing feedback to the low-rated group.

Finally, we turn to organisational-related factors for FSB. When feedback is too late, particularly if it perceived as already having been received in a face-to-face setting in the interim, FSB is low. Furthermore, high frequency of feedback interacts with learners' high workload leading to a reduction in FSB. Although timing and frequency of feedback has been examined in the medical education literature, previous studies concentrated on feedback efficacy, rather than its impact on FSB.[32] As such, this is a unique finding that can inform curricula development above and beyond the e-portfolio setting within which a study sits.

As with all studies, our research has limitations. Firstly, the data has been collected at a single institution in a single country so caution must be taken for the transferability of our findings. For example, as we have highlighted, the face-saving effect might be exaggerated within a Taiwanese culture. Secondly, we have used a qualitative individual interview method. Such face-to-face data collection might motivate participants to present themselves positively. We are therefore careful not to quantify our data, and make no claims regarding the relative importance of factors and the magnitude of their influence. However, our study has strengths. The setting in which it was conducted is the largest teaching hospital in Taiwan, we have a relatively large participant group and have used theory to facilitate the transferability of findings within a medical education context.

Our study has implications for educational practice. Providing learners with information on how to address their learning needs, thus facilitating the relevance of their reflective writing, could result in higher levels of FSB. Faculty development focusing on the provision of relevant, focused and high-quality feedback, is recommended. We also advise e-portfolio developers to work with students and educators when developing their user systems. Finally, the implementation of an e-portfolio should be considered in the wider context of both learners' and teachers' existing workload and opportunities for face-to-face feedback to ensure that the timing and frequency of feedback does not impede learners' FSB or create additional work for busy teachers and their trainees.

Our research also highlights the need for further work in terms of researching learners'

FSB within healthcare settings. In an era in which feedback studies are prevalent, too much attention has been placed on the efficacy and the delivery of the feedback itself, rather than learners FSB, which is assumed to occur. However, this is not always the case. Without fully understanding the relative factors that facilitate and impede learners' FSB across a range of learning situations, the goals of feedback in healthcare education cannot be fully achieved.

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Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

No. Item	Guide questions/description	Response / Reported on Page #
Domain 1: Research team and reflexivity		
Personal Characteristics		
1. Interviewer/facilitator	Which author/s conducted the interview or focus group?	***See 'data collection' in Methods (page 9)***
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	***See title page (page 1)***
3. Occupation	What was their occupation at the time of the study?	***See title page (page 1)*** REN-HUEI FU is general practitioner at Chung Gang Memorial Hospital, Department of Neonatology; medical educator at Chung Gang Medical Education Research Centre (CG-MERC), Linkou, Taiwan. YU-HSUEH CHO is a Master of Chinese Medicine and researcher of the CG-MERC, Chang Gung Memorial Hospital, Linkou, Taiwan. QUATTRI FRAN, PhD, is a linguist and Post-Doctoral Researcher at the CG-MERC, Chang Gung Memorial Hospital, Linkou, Taiwan. MONROUXE LYNN, PhD, is a cognitive psychologist and Director of CG-MERC, Chang Gung Memorial Hospital, Linkou, Taiwan.
4. Gender	Was the researcher male or female?	**KHF:** Male **LVM, FQ, YHC:** Female
5. Experience and training	What experience or training did the researcher have?	**LVM** has vast experience of conducting qualitative research and analysis (over 15 years each). **FQ** has previous experience in qualitative research and analysis. **KHF** has previous experience in research but not qualitative **YHC** had training in interviewing LVM supported the team throughout the analysis, coding and writing process.
Relationship with participants		The interviewer, **YHC**, and **LVM** and **FQ** had no prior relationship with the students **KHF** (who was not present during interviews) had a role in developing the e-portfolio
6. Relationship established	Was a relationship established prior to study commencement?	***See 'Design' in Methods (page 9)***
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	***See Data Collection section in Methods (page 10)***

8. Interviewer characteristics	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	***Described on page 9***
Domain 2: study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	***See 'Design' in Methods (page 9).*** We used a qualitative interview design, we explain our analytical process.
Participant selection		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	***See 'recruitment' in Methods (page 9).*** Participants were self-selected using purposive sampling. All participation was voluntary.
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	***See 'data collection' in Methods (page 9).***
12. Sample size	How many participants were in the study?	***See 'Participants' in Methods (page 9)*** "Participants comprised n=71 PGY1 (60% of cohort; 66% male)"
13. Non-participation	How many people refused to participate or dropped out? Reasons?	Participation was voluntary and participants were not considered to take part until they participated in the interviews. No participants withdrew from the study after participating in interviews.
Setting		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	***See 'Data collection' in Methods (page 9)*** "Interviews were conducted in a quiet room at participants' convenience." –
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	***No***
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	***See 'Participants' (page 9)*** The gender has been reported.
Data collection		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	***See 'Data collection' in Methods (page 9)***
18. Repeat interviews	Were repeat inter views carried out? If yes, how many?	***No***
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	***See 'Data collection' in Methods (page 9)***
20. Field notes	Were field notes made during and/or after the interview or focus group?	***None made.***
21. Duration	What was the duration of the interviews or focus group?	**Individual semi-structural interview, 20-30 min each, "procedure" page 11**
22. Data saturation	Was data saturation discussed?	We do not report this as we do not consider this to appropriate for our research position (Varpio L, Ajjawi R, Monrouxe LV, O'Brien B,

		Rees CE (2017) Shedding the cobra effect: problematising thematic emergence, triangulation, saturation and member checking. Medical Education. 51(1)40-50.)
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	We do not report this as we do not consider this to appropriate for our research position (Varpio L, Ajjawi R, Monrouxe LV, O'Brien B, Rees CE (2017) Shedding the cobra effect: problematising thematic emergence, triangulation, saturation and member checking. Medical Education. 51(1)40-50.)
Domain 3: analysis and findings		
Data analysis		
24. Number of data coders	How many data coders coded the data?	***See 'Data analysis' in Methods (page 10)***
25. Description of the coding tree	Did authors provide a description of the coding tree?	***See Results Section, Table 1 (page 10)***
26. Derivation of themes	Were themes identified in advance or derived from the data?	***See 'Data analysis' in Methods (page 9)*** Themes were inductively and deductively developed.
27. Software	What software, if applicable, was used to manage the data?	***See 'Data analysis' in Methods (page 9)***
28. Participant checking	Did participants provide feedback on the findings?	We do not report this as we do not consider this to appropriate for our research position (Varpio L, Ajjawi R, Monrouxe LV, O'Brien B, Rees CE (2017) Shedding the cobra effect: problematising thematic emergence, triangulation, saturation and member checking. Medical Education. 51(1)40-50.)
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	***Yes***.
30. Data and findings consistent	Was there consistency between the data presented and the findings?	We have ensured consistency between the data presented and the findings of the study through thoroughly reviewing the manuscript.
31. Clarity of major themes	Were major themes clearly presented in the findings?	***See 'Results' (page 10-17)*** The results section is organized around the major themes of the study, which are described under specific headings.
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	***See 'Results' (page 10-17)*** The results section includes discussion of major themes, and nuances within these were covered.

BMJ Open

"I did not check if the teacher gave feedback": A qualitative analysis of Taiwanese post-graduate year-one trainees' talk around e-portfolio feedback-seeking behaviours

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"*I did not check if the teacher gave feedback*": A qualitative analysis of Taiwanese post-graduate year-one trainees' talk around e-portfolio feedback-seeking behaviours

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RHF conceived the study. RHF and LVM designed the work. YHC contributed to the

acquisition of the data. All authors contributed to the analysis and interpretation of data. RHF, FQ and LVM drafted the initial manuscript. All authors revised the manuscript critically for important intellectual content. LVM and RHF substantially revised the paper. All authors gave their final comments and approval of the version to be published. LVM is the guarantor, agrees to be accountable for all aspects of the manuscript, has access to the data, made the final decision to submit and will ensure that any questions relating to the accuracy or integrity of any part of the manuscript are appropriately investigated and resolved.

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Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

Ethical Approval

The research was approved by the research ethics committee of Chang Gung Memorial Hospital.

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Transparency declaration

Lynn V Monrouxe (the manuscript's guarantor) affirms that the manuscript is an honest, accurate, and transparent account of the study being reported; no important aspects of the study have been omitted; and any discrepancies from the study as planned have been explained.

Patient consent

Not applicable.

Data sharing statement

The raw data for this research comprises audio-recordings of interviews. The principal investigator (R.H. Fu) has access to this specific data set, including interview transcripts, in addition to participant contact details and signed consent forms. All authors have access to anonymised data from this set. All data are securely stored in on password-protected and encrypted computers. Participants have not given their permission for data sharing outside the research group. Thus, no additional data is available.

Abstract

Objectives: Despite feedback being an extensively researched and essential component of teaching and learning, there is a paucity of research examining feedback within a medical education e-portfolio setting including feedback-seeking behaviours (FSBs). FSBs can be understood within a cost-value perspective. The objective of this research is to explore the factors that influence post-graduate year-one (PGY1) trainee doctors' FSBs via e-portfolios.

Setting: Post-graduate education provision in the largest teaching hospital in Taiwan.

Participants: Seventy-one PGY1s (66% male).

Methods: A qualitative semi-structured one-to-one interview method was adopted. Interviews were audio-recorded, transcribed verbatim, anonymized and checked for completeness. Data were analysed inductively via thematic Framework Analysis and deductively informed they FSB theory. The process comprised: data familiarization, identification of the themes, charting and data interpretation.

Results: Two main themes of FSB-related and e-portfolio-related were identified. We present the theme focussing on FSB here to which n=32 (22 males, 10 females) of the n=71 participants contributed meaningfully. Sub-themes include factors variously affecting PGY1s' positive and negative FSBs via e-portfolios at the individual, process and technological levels. These factors include learner-related (internal values vs. social influence, forced reflection); teacher-related (committed educators vs. superficial feedback); technology-related (face-saving vs. lagging systems; inadequate user-interface); and process-related (delayed feedback, too frequent feedback) factors.

Conclusions: Our findings reveal the complexity of PGY1s' FSBs in an e-portfolio context and the interaction of numerous facilitating and inhibiting factors. Further research is required to understand the range of facilitating and inhibiting factors involved in healthcare learners' FSBs across different learning, social, institutional and national cultural settings.

ARTICLE SUMMARY

Strengths and limitations of this study

- Our qualitative approach has facilitated the exploration of feedback-seeking as an unexpected phenomenon within our study (i.e. as highlighted by participants during the interviews rather than being the main focus of the original study)
- The multi-cultural, multi-disciplinary make-up of the research team – including expertise in psychology, linguistics, medical education and medicine – facilitated a deeper understanding of both the process and the content of the data
- The use of current theoretical perspectives of feedback seeking nabled us to unpack the learner, teacher, technological and process-related factors impacting on trainees' willingness to seek out and utilise teachers' feedback within an e-portfolio setting that can be transferable outside the study context
- Although only n=32 participants meaningfully contributed to our findings. This is a substantial number for a qualitative study of this kind, considering the detailed information that each participant provided.
- The context of feedback seeking behaviours within e-portfolios in a Taiwanese teaching hospital is likely to have emphasized some of our findings, including the face-saving utility

Introduction

Feedback is an essential component of the teaching and learning process and has been extensively researched in this decade.[1] Giving learners feedback means letting them know, in a timely and on-going way, how they are progressing.[2,3] Indeed, during clinical placements, the provision of feedback is an integral part of the learning process, enriching students' learning experience.[3] Constructive feedback from educators enables learners to gain insight into their actions and consequences, and this allows both learners and teachers to successfully achieve personal and program-related objectives.[4]

Furthermore, research suggests that some forms of feedback (e.g., reinforcement, video/audio feedback, computer-assisted instructional feedback) can be more effective than others, with effective and regular feedback having the potential to reinforce good practice and motivate the learner toward the desired outcome.[5] However, feedback is a two-way process. Although a general complaint heard from students and trainees is often that "*I never receive any feedback*", [6] some clinical teachers believe that students and trainees often lack motivation for seeking feedback.[3,7] To investigate whether it is just a matter of motivation, our study focuses on trainee doctors' feedback-seeking behaviour (FSB) within e-portfolios.

Feedback-seeking behaviour

Feedback-seeking behaviour (FSB) has been defined as "[a] conscious devotion of effort towards determining the correctness and adequacy of behaviours for attaining values and states".[8] For this to happen, it requires both conscious effort and motivation to change.

A recent scoping review of the literature around feedback for learners in medical education failed to identify any studies on learners' FSB.[1] Indeed, although we identified a small number of papers on FSB within medical education, the vast majority of research was conducted in organisational contexts adopting existing FSB theories without challenging their validity.[9]

FSB seems to occur in two primary ways: requesting feedback from another (typically senior) colleague or observing others' behaviours.[10] In the case of an e-portfolio, however, the 'request' comes in the form of returning to the online forum and reading the feedback provided. Ashford and colleagues proposed that the cost and value of any given action are the primary determinants of FSB.[11] Nevertheless, a number of factors affect cost and value of actions. For example, one key perceived cost is *self-presentation*, including the potential embarrassment of revealing one's lack of knowledge, thereby drawing attention to personal

deficiencies. Other costs include *ego costs* (i.e., the risk of being the recipient of negative information), and *effort costs* (i.e., the risk of wasting energy and time with little return value).

Value is the perceived worth of FSB in learning new behaviours/skills to improve performance.[10] As such, the *expectancy* of this value has been shown to increase the frequency of FSB.[12] Furthermore, self-preservation is associated with value: through requesting feedback we can create or enhance a positive image of ourselves.[10] This theoretical work appears to transfer well into a medical education context. A qualitative study examining FSB in veterinary students during their clinical years found their FSB to be affected by perceived ego (e.g., feeling incompetent through negative feedback), image (e.g., the presence of peers) and costs and benefits (utility of feedback).[13]

Goal orientation theory (personal goal preferences in achievement situations) has also been used to understand influences on the feedback-seeking process and comprises two main orientations: *performance* and *learning* goal orientations.[10] *Performance goal orientation* focuses on demonstrating and validating one's competence by seeking favourable (and avoiding negative) judgments. Here individuals focus on the cost of feedback-seeking, leading to low FSB. *Learning goal orientation* emphasizes developing competence: increasing FSB to benefit their job performance and for self-enhancement.[10] Situational factors have been shown to have a strong impact on which orientation is used.[10]

Research in medical education has considered resident doctors' goal orientation around feedback-seeking.[14] A positive relationship between the value placed on feedback and FSB frequency was identified.[14] Additionally, the situational factor of having a supportive supervisor influenced residents' likelihood to place a high value on feedback and see fewer costs for FSB.[14] Furthermore, research with residents in Switzerland also supported the influence of situational factors on FSB: supervisors' promotion of feedback-seeking was the sole predictor of residents' FSB through inquiry and increased their learning goal orientation.[15] Finally, this situational factor was associated with lower ego-protection and impression management concerns.[15]

Other research in organizational and educational settings suggests that national culture can influence FSB.[3,7] Motives underlying FSB include: an *instrumental* motive (high FSB to facilitate personal goal achievement and develop behaviours); an *image-defense* motive (FSB is tied up with a wish to maintain a high social image); and an *ego-defense* motive (in an attempt to maintain one's ego individuals avoid seeking feedback or do so strategically)[7]. Individuals from Western and Eastern (particularly Chinese) cultures are thought to react

differently to such influences. Indeed, research with Chinese management students suggests that FSB is strongly related to the issue of face (i.e. the fear of losing face before others), resulting in FSB being low when others are present.[3]

Feedback via e-portfolios in medical education

Portfolios assess what a learner does when functioning independently in the clinical workplace and are designed to stimulate learning from experience.[16,17] In the postgraduate arena, portfolios can be used for a number of different, yet interrelated, purposes including: as a tool for training in which a collection of skills and competencies, alongside reflective comments on development, are held; as a reflective tool of personal development for promotion selection; and as a person development tool containing reflective valuations progress over time.[18] Portfolios in postgraduate education tend to be mandatory. To serve the purpose of education, it is suggested that portfolios should contain evidence of how learners fulfil tasks and how their competence is progressing. Nowadays, portfolios are mostly digital (e-portfolios), with content that can be prescribed or left to the learners' discretion. Despite variations, their role is to record work undertaken, feedback received, progress made and plans for improvement.[19] In medical education, the content of trainees' e-portfolios may include quantitative assessments (such as the Mini-Clinical Evaluation Exercise, Direct Observation of Procedural Skills, Case based Discussion, and 360 degree evaluation), reflective writing (such as medical ethics and legislation report, health care quality report, and personal development report), and Evidence-Based Medicine report. Clinical teachers are required to assess the trainee and provide appropriate feedback on their assessment and reports in their e-portfolios. The utilization of e-portfolios has the potential to change the nature of learning environments and the ways in which trainee learning is promoted through different modes of learning.[20] As such, the work collected in the e-portfolio provides material for the trainee to review their learning and can be used as a basis for future assessment.

Feedback is a key element of any e-portfolio: feedback information is needed so the learner can reflect and formulate their future plans and develop learning objectives in order to improve their performance and competencies.[17] Furthermore, in the age of competency-based education, continuous, detailed and targeted feedback is essential.[21] Although staff and trainees do not always share a common understanding of the role of feedback in supporting learning,[20] evidence suggests that well-implemented portfolios are effective and practical, increase personal responsibility for learning and support professional development and so engaging in feedback via e-portfolios is of utmost importance.[22] On a positive note, feedback

via e-portfolios has been shown to encourage reflection among users.[22] On the downside, scepticism about the purpose of the e-portfolio and lack of time for completion are also reported.[23] However, despite the plethora of research that has been undertaken examining FSB in an organizational setting,[24] and the potential of e-portfolios for supporting the feedback loop, to our knowledge there is no research to date that has examined FSB in the context of e-portfolios. This is an obvious omission given the often-compulsory nature of e-portfolios in the post-graduate setting and the importance of feedback for the development of professionalism and competencies in the clinical setting. Indeed, given the key role of feedback in the learning process, understanding why learners sometimes fail to take the first step and seek out their feedback is an important, yet under-studied issue in the e-portfolio context.[25]

Aim and research question

The aim of our research is to understand postgraduate year one medical trainees' (PGY1s') feedback seeking behaviours in the context of an e-portfolio, which, for the purposes of this study, we define as 'motivations and behaviours towards looking for, reading, or mentally engaging with feedback delivered via an online portfolio'. Specifically we wish to answer the following research question (RQ):

> RQ: What are the factors that influence postgraduate year one medical trainees' feedback seeking behaviours within an e-portfolio context?

Methods

Study context

The study was conducted at the largest teaching hospital in Taiwan. PGY1 trainees are in the transitional period between medical student and clinical physician. They are licensed physicians who receive a training program as they transition from medical students to specialty residents. The PGY1 training program of general medicine was implemented by the Taiwanese government for professional training in general practice in 2011. E-portfolios were introduced in 2013, and gradually substituted paper-based portfolios. The portfolio in this setting is a collection of evidence of the PGY1s' learning experience during their training. It comprises a default template for several assessment and evaluation criteria including a quantitative assessment (e.g. Mini-Clinical Evaluation Exercise (Mini-CEX), Direct Observation of Procedural Skills (DOPS), Case-based Discussion (CbD)) and

qualitative, reflective writing sections (e.g. Medical Ethics and Legislation Report, Medical Care Quality Report and Personal Development Report). According to Taiwanese regulations for e-portfolios, trainees are expected to fill the e-portfolios numerous times over the course of their training (14 workplace-based assessments and 22 reflective writing reports during the PGY1 training). In terms of the workplace-based assessment (e.g. Mini-CEX, DOPS, and CbD), clinical teachers are required to evaluate the performance of the PGY1 trainee and provide them with a score and feedback immediately following their bedside teaching. Clinical teachers are required to upload feedback to the trainees' e-portfolio afterwards. For the reflective writing reports, clinical teachers provide feedback about trainees' reports following each submission. Thus, PGY1s receive feedback for different assessments and from different rotations during the same training period.

Patient involvement

No patients were involved in the design or instigation of this study.

Design

A qualitative study with one-to-one, semi-structured interviews was employed to explore the perception and experience of PGY1 trainees about their engagement with clinical teachers' feedback provided in their e-portfolio. Following the piloting of the interview questions (n=5 PGY1) only slight changes were made. Several questions were asked in the interview, including: There are numerous reports and assessments in the e-portfolio which are followed by clinical teachers' feedback, did you read them all? If so, why? If not, why not? Do you think you have received appropriate feedback in your e-portfolio? Is there any difference between paper-based, e-portfolio and face-to-face feedback? Do you find it helpful to receive clinical teachers' feedback through the e-portfolio? Does feedback affect you in any aspect of your clinical practice? Do you change your behaviour or advance your knowledge following feedback?

Participants

Following ethical approval, all 118 (65% male) PGY1 trainees from the 2014 cohort were approached to participate. Participants were self-selected using convenience sampling. When the researcher contacted the trainees, a brief introduction including the purposes and methodology of the research project was given to the trainees. They were told that the research was being led by a physician educator: there were nine physician educators in the hospital at the time. The trainees were assured that the interview would be anonymized after transcription. The research team members only analyzed anonymized data. The researcher

that performed the interview did not know any of the trainees before they met. All participation was voluntary. Informed consent was obtained. Participants comprised n=71 PGY1 (60% of cohort; 66% male) trainees. A larger participation group than originally intended was recruited due to the fact that a number of participants' interviews were brief as they had not accessed the feedback section of their e-portfolio (the first question of the interview). Given that our original focus to was to examine engagement with feedback and differences between paper and electronic feedback we continued to accept participants into the study until we felt that sufficient data had been obtained to address these issues.[26] The interviews were arranged within the last three months of their training courses so that all participants were familiar with the e-portfolio system.

Procedure

A researcher, who was a previous medical technologist (YHC) external to the hospital with interview experience, conducted all interviews. Interviews were conducted in a quiet room at participants' convenience. Interviews were audio-recorded, transcribed verbatim, anonymized and checked for completeness. Each interview lasted around 20-30 minutes and took place in a private room at the hospital.

Team reflexivity

The research team comprised a multilingual (Mandarin, Italian and English), multi-professional (clinicians, a linguist, and a psychologist) and multicultural (Taiwanese, Italian and English) group. Although the non-Taiwanese members of the research team had some proficiency in Mandarin, some of the data needed to be translated into English so that LVM could fully participate in the data analysis process. Discussions around the data were held in both Mandarin and English, and translational and cultural issues were addressed. Discussion around team members' approaches to the data, and their relative closeness to the focus of the research (e-portfolio, postgraduate participants) were held as data were analysed.

Data analysis

Data were analysed using inductive thematic Framework Analysis,[27] comprising: data familiarization, identification of the themes, charting and data interpretation. Additionally, as cost-value and goal orientation theories were known to the researchers, it is acknowledged that they also influenced data analysis deductively (although data were not specifically mapped to these theories). Four researchers (RH, YHC, CCC, PWH) read the transcripts, distributing them among each other so that all transcripts were read by at least two people. Following this, two researchers (FQ, LVM) joined the team to further develop the thematic focus of FSB. Data were translated from Mandarin to English by the CG-MERC official

translator (see Acknowledgements). The researchers came together several times to discuss the coding framework development. The framework was written as a document to facilitate coding consistency and analytical development. Data were coded by one person. As the data were coded, further developments of the themes were discussed with the wider team and incorporated into the final analysis in the framework document.

Results

Two main themes were identified, of which one is FSB-related and the other one is specifically related to the e-portfolio in use (i.e. comparison between e-portfolio and paper-based portfolios). This research reports on the theme of "Inhibiting and facilitating factors around FSB", which comprises four sub-themes (see Table 1). Thirty-two (22 males and 10 females) of the 71 participants contributed meaningfully to this theme, presented here. The remaining n=39 participants mainly focussed their talk around the e-portfolio in general (e.g. their engagement with it and with reflection) and comparisons between online and paper-based portfolios: and while responding to the direct questions around feedback seeking, they did so superficially and therefore fail to contribute meaningfully to the issue of feedback-seeking behaviours.

Table 1: Learner, teacher, technology and process-related factors for trainees' feedback-seeking behaviours

	Inhibiting factors	**Facilitating factors**
1: Learner-focussed	Poor learning-needs assessment (*what to have feedback on*) Emotional reactions (*about teachers*)	Value placed on feedback (*feedback as a gift to be saved*) Value placed on teachers (*learning from seniors*)
2: Teacher-focussed	Delayed feedback (*irrelevant*) Generic feedback (*irrelevant*)	Relevant feedback (*high utility; facilitates self-regulation*) Dedication to teaching (*high utility; trainee respect*)
3: Technology-focussed	Poor user-interface (*time-wasting; irrelevant material upload*) Lack of reminders (*forgetting to check*)	Online versus face-to-face (*face-saving utility*)
4: Process-focussed	Timing (*repetition*) Frequency (*workload*)	None mentioned

Inhibiting and facilitating factors around trainees' feedback seeking behaviours (FSB)

Participants discussed their engagement with feedback in terms of if and when they sought it within the e-portfolio. They discussed the various factors that influenced their engagement

that we report as sub-themes: (1) learner-focussed factors; (2) teacher-focussed factors; (3) technology-focussed factors; and (4) process-focussed factors.

Sub-theme 1: learner-focussed factors

This sub-theme focuses on the inhibiting and facilitating learner-related factors to participants' FSB. In terms of inhibiting factors, some participants pointed out that the lack of guidance and clear directions on how to complete the e-portfolio and what to write in it, resulted in them making inauthentic submissions. They expressed problems in terms of their own learning-needs assessment that eventually impacted on the perceived utility of the feedback for personal development, further inhibiting feedback seeking. The following participant highlighted this issue, calling for more initial guidance during their face-to-face meetings about how to complete the e-portfolio to make the subsequent feedback more relevant (so facilitating feedback seeking motivation):

> *The parts on guidance and discussion are not enough […] the thing is, if you organize the things on your own, the breadth and the depth of the feedback will be limited. Sometimes you need to have discussions with your peers and educators […] So I think, if it's a small group discussion, probably the teacher could do a more detailed guidance…probably the students would get more.* (PGY#5)

The issue of superficial feedback, or generic feedback, was further discussed and linked to participants' relative engagement with feedback seeking around the patient cases they encountered. Thus, feedback was directly related to their own input whereby brief case reports received brief feedback. Some participants related this to their engagement with the clinical setting, whereas others related it to the relative importance individual PGYs placed on the e-portfolio process itself: a lack of engagement with the e-portfolio resulted in feedback that was of little importance and therefore ignored whereas high levels of engagement motivated feedback seeking:

> *It goes back to the point. Not every division has many cases to write. If there were a case really worth of discussion, then the teacher's feedback would also be richer.* (PGY#17)

> *Of course, it [feedback seeking] is related to whether you write your e-portfolio seriously. If the teacher found it seriously written, then he would spend some time to provide feedback.* (PGY#16)

Finally, emotional aspects of receiving feedback were also highlighted as a factor that inhibited participants from seeking out or reading their feedback. This emotional aspect also included how participants might perceive the feedback providers according to the type of feedback received:

> *I almost never see it [the feedback from the supervisor]! Because I think that after seeing it, you would develop a stereotype about the teacher […] then suppose he gives you a high score, you would feel this teacher is good. And if he gives you a low score, you would consider the teacher is not kind.* (PGY#7)

> *Yes, it is embarrassed for us to say the clinical teacher's feedback is too short. That doesn't feel good. Therefore, I would rather not to look at it.* (PGY#2)

Other participants (the minority) simply lacked internal motivation to seek feedback online. Reasons for this included going along with perceived social norms [i.e. others do not do it so they also do not]:

> *I have never seen the teacher's feedback* (PGY#3)
> *I think no one would check the feedback in the e-portfolios*. (PGY#13)

However, despite there being numerous inhibiting factors for participants' FSB, there were also learner-focussed factors that were cited as facilitating feedback seeking. The value that participants placed on feedback was a key motivating factor for seeking feedback out. Thus, feedback was seen by some as being a *gift for learning*, something to be actively sought out and kept. Some participants talked about feedback within e-portfolios as being the most important part of the process, facilitating practice improvement and therefore something to be sought out and even kept:

> *If teachers give feedback based on our reports, I will have a different way of thinking about my future practice. Then, in some aspects, I would improve my clinical practice. I think 'this is good' […] of course the teacher's feedback should be saved. If we spend time writing up, we need to learn something out of it[…] I think teacher's feedback should be kept.* (PGY#16)

> *I would read the teacher's comments in the last part. I think that part is the most important*. (PGY#18)

The high value placed on feedback includes valuing their clinical teachers' experience, even if they felt there was a generational gap around how things are done now versus how they used to be done. Essentially it is around an openness to listen and learn from seniors, and when that openness is present, feedback is sought and valued:

> *The teacher's feedback to me is […] also […] you could see how the experienced teacher handled this part. Maybe our thinking is different from the way the teachers deal with things. At that time, it's not necessary about who is right or wrong but about how you can...you can integrate the practical experiences from different aspects and make further progress.* (PGY#19)

Sub-theme 2: *Teacher-focussed factors*

The issue of teachers' remembering comprised the main teacher-focussed inhibiting factor for FBS. Thus, some participants reported that they were unable to link feedback to their specific experiences if it was delayed resulting in them disengaging with feedback seeking after an initial period of engagement. Indeed, they believed that when feedback was delayed, even their educators would have forgotten the event, resulting in the feedback being construed as overly generic and 'nonsense', further inhibiting their feedback seeking motivation:

> *If the feedback was delayed, it became not so specific to my case report. I can't remember what happened to the case after I reported it. I don't think my clinical teacher remembered it either. Therefore, the report and feedback became nonsense.* (PGY#20)

The issue of forgetting on the part of the teacher also interacted with forgetting on the part of the trainee:

> *Sometimes my teacher forgets to give feedback, or is delayed in uploading feedback. I guess he is too busy in clinical loading. Several days later, I might also forget to check the feedback.* (PGY#2)

> *I haven't seen it yet. I tried clicking before, but … er, it seems that most of them [the teachers] haven't given [the feedback], so I didn't check particularly afterwards*. (PGY#21)

Not only did participants refer to the issue of their teacher remembering specific events, but

they also questioned whether their clinical teachers could even remember specific students. When feedback is delayed from the face-to-face event, and delivered online at a later point, it is imperative that the teacher can match a face to a name as well as recall the event. Due to the number of PGYs who rotate through each department, and the generic nature of feedback received, some participants doubted the authenticity of what they read. Inauthentic feedback inhibits later feedback seeking motivation:

> *I have seen some. But the feedback I have seen is very generic, because I think that the teacher may not remember […] that many students. When he sees your name, he might not know […] he may not be able to link it [to the person].* (PGY#14)

> *I am not sure if the teacher will read it carefully, because he also needs to lead many students, and he has patients, the work at the clinic, and some research and administration work […] I think it is difficult to ask every physician to read them [e-portfolios] carefully.* (PGY#6)

On the flipside, some participants reported that they not only received generic, nonsensical feedback, but they also received quality feedback. Quality includes teachers feeding back on specific cases reported (relevant feedback) which were used by participants both prospectively (reading feedback and changing practice) and retrospectively (reading feedback after encountering problems to seek solutions). Further, ego factors and value intertwined. For example, reading feedback promoted new thought and action, leading to a positive self-image and therefore high levels of FSB engagement:

> *Of course, actually it is not only limited in this part. When I have some clinical problems, I would check it up [the feedback] and do changes afterwards […] during the process of checking, you would find out some- some new things.* (PGY#5)

> *Some clinical teachers would give me feedback specific to the cases that I reported, such as the care quality report, or the ethical report. This kind of feedback always gives me new thoughts on how to manage the cases. In some way, I think it will change my way of doing practice in the future. I like to read this kind of feedback.* (PGY#16)

Some participants also highlighted teachers' dedication to educating them. Educators taking feedback seriously, giving time to the trainees to improve, which further motivates trainees'

positive FSB:

> *Then, my mentor happened to be [names doctor], on this aspect [feedback] he works really hard […] most of the teachers, when they are doing the e-portfolio, they just deal with it by writing two or three words. But [names doctor] takes it seriously. He gives feedback seriously […] It's helpful. It's helpful…maybe sometimes I would take a look when I feel interested.* (PGY#8)

Sub-theme 3: *Technology-focussed factors*

The existing technological infrastructure in use at the hospital, the e-portfolio's default template and functions, alongside the requirements for completion (i.e. all workplace-based assessments and writing reports were compulsory) often discouraged trainees in finishing the task, or in them doing it properly. For example, the lack of technology infrastructure led participants to complete their submissions at home after work, causing time delays and difficulty in writing. Technology-focused factors affect the general engagement of PGY trainees with e-portfolio. They also affect the feedback system and seeking of feedback. These factors dovetail with earlier issues (inadequate submissions leading to inadequate feedback) resulting in a lack of engagement with the feedback process:

> *Because if it's paper, you can bring it with you anywhere. And you can immediately see the feedback the teacher gave to you. If it's e-portfolio, if you are in the hospital, basically you don't have time to use the computer…firstly, the computers in the hospital are not always enough, and the interface is not intuitive to use. Because after you go home […] it's lagging and then [you don't check]* (PGY#14)

Some participants also uttered their dissatisfaction with the lack of a reminder function to alert teachers and trainees to give and receive feedback. This interacted with the issue of teachers' heavy clinical workload. As such, after checking for feedback a number of times, participants reported giving up or forgetting to check:

> *I think a reminder mechanism could be set [for teachers], otherwise, [it will be] like last time [when] they did not review the e-portfolios for over six months. This is horrible.* (PGY#2)

> *At the time, I did not check if the teacher gave feedback, because some doctors were busy, and they wouldn't give feedback that quickly. I am thinking […] when they give it, maybe we could receive an email or something?* (PGY#6)

Or maybe, after the teacher gives feedback, something could pop out when you log into the e-portfolio the next time to remind us that the teacher given some feedback, so we could go there and read it. Otherwise, we won't remember to click [...] We won't. We only click the place where we need to write. (PGY#15)

However, not everyone felt that the infrastructure was the issue: quite simply, if you want to learn, you will and if you don't want to learn, you won't – linking with the issue of learner-focussed factors:

So I said, it is a problem about people, because those who want to learn will learn for sure […] they will learn anyway […] for the people who don't want to learn […] they will not learn. It's a problem about people, nothing to do with the system! (PGY#13)

However, the fact that feedback takes place in an online space, rather than physically face-to-face, was considered to be a technology-focussed facilitating factor for FSB. Indeed, participants talked about feedback being mainly around their deficits, rather than for praise which inhibited their desire to seek it out. Receiving negative information about one's practice is never easy, and even more so within an Eastern face-saving culture. Thus, the online nature of e-portfolios facilitates the necessary face-saving requirements around seeking out feedback, whilst enabling participants to learn from mistakes:

Except when I have something that I really […] for example, I don't want to […] I felt embarrassed to discuss it [for feedback] with the teacher in person, so I would put it there in words. (PGY#13)

I think it is not bad to have feedback in e-portfolio. After all, we are all working at the same place. It would be embarrassing to tell us directly what was wrong. Because I maybe follow orders from other staff, one could lose his face to hear negative feedback. However, we need to know what was wrong. To write it in e-portfolio is a good idea to avoid losing face. (PGY#20)

Sub-theme 4: *Process-focussed factors*

The process of the e-portfolio itself, including the timing and frequency of feedback, appeared to affect participants' FSB negatively (we have no data regarding positive aspects

for this sub-theme). Trainees highlighted how they are expected to reflect on the cases they experience, obtaining written feedback from their teacher/mentor via the e-portfolio. However, in workplace-based assessments, the clinical teacher often provides immediate feedback directly following the presentation of a clinical case typically by arranging discussions and teaching at the patients' bedside. The repetition of this feedback exercise was a key factor in participants' decreased e-portfolios FSB:

> *Yes! [the] clinical teacher has given me a paper form feedback after our CbD* [case-based discussion*], the feedback in the e-portfolio appears to be redundant. I didn't look at that. […] Yeah- yeah- yeah- yeah! [...] because when you have individual meetings with your teacher, you have already submitted a form.* (PGY#1)

Indeed, some participants talked about how such doubling up of feedback resulted in superficial engagement on both sides:

> *Well after the writing, you just review the situation! He (the teacher) just re-reads [it…] and [talks about] any problems in-between [written feedback].* (PGY#15)

The frequency with which participants are required to fill in their e-portfolios appears to impact negatively on trainees' FSB. Many participants asserted that feedback lacks utility when it is provided too often:

> *I think the frequency could be every 6 months or every year […] you only have that picture for your personal plan, and writing it every month won't change something. Actually, I think it is a bit too frequent.* (PGY#3)

Further, this frequency increased their already high clinical workload resulting in both an impediment to using the e-portfolio in the first place (for both participants and their teachers), as well as the additional work resulting from the e-portfolio feedback (i.e. being required to act on it) This translated into a reluctance for some to seek out their feedback as engaging with it impacts on their workload.

> *This [acting on it] might not be possible, because we are very busy. If I have 20 patients for that day, then I won't do any writing. I don't even have time to finish my stuff.* (PGY#9)

> *Monthly reports are better. We can write a more detailed reflection. Clinical*

teachers can then receive meaningful reports and give proper feedback. The workload will not be too heavy […] when I think about the loading, I don't want to see the feedback. (PGY#12)

Discussion

Our findings highlight the complexity of aspects affecting FSBs that include individual, social, technological and organizational factors working as catalysts or inhibitors in congruence with cost-value perceptions of individuals.[28] That FSB is influenced by the perceived utility of that feedback, albeit for a variety of different reasons, resonates with other research that highlights how learners' FSB motivations focuses on performance improvement:[11,28] if the learner anticipates that the feedback will be worthless, FSB will be low. So when learners believe that the submissions on which the feedback is based lacks authenticity, arrives too late, or is highly generic, FSB motivation reduces. But when feedback is considered relevant and delivered by dedicated educators, high FSB motivation is sustained. This finding links with research that points to learners' relationships with their seniors (including expertise and trustworthiness) as being a key aspect underlying FSB and subsequent feedback efficacy.[28-30] Other learner-centred findings such as perceived social norms (i.e. no one else seeks feedback) and the strategic use of feedback (i.e. prospectively and retrospectively) appear to be quite novel in the FSB literature, although a consideration of the organisational culture and its impact on feedback giving and expectations has been acknowledged.[25] This might be due to the context in which we have examined FSB: although feedback utility has been explored, it has not considered the inadequacy of the work on which the feedback is focused.

In our study, poor user interface, slow connectivity and a lack of reminders interrelated with participants' low FSB. Higher FSB is associated with the online nature of the e-portfolio and how it facilitates learners' face-saving. This is particularly important within the setting of our study – Taiwan – where face-saving is of utmost importance culturally. This finding resonates with other research undertaken in an Eastern culture with management students[3], with face-saving being considered a value within a cost-value model of FSB.[24] However, it should be noted that this face-saving benefit is not specific to Eastern cultures and manifests itself globally, albeit to a different extent. For example, Ginsburg et al.,[31] analysed face-saving strategies in written feedback for low- and high- rated Canadian PGY1 doctors. They found that feedback providers used more terms addressing PGY1s' positive

face in the high-rated group (e.g. ‘absolutely outstanding’, ‘a pleasure to work with’) and more hedges when providing feedback for the low-rated group (‘could have’, ‘a little more’, ‘fairly’). Furthermore, feedback providers also used hedges to ‘shield’ themselves (‘probably’, ‘perhaps’) thereby protecting their own face, particularly in the context of providing feedback to the low-rated group.

Finally, we turn to organisational-related factors for FSB. When feedback is too late, particularly if it perceived as already having been received in a face-to-face setting in the interim, FSB is low. Furthermore, high frequency of feedback interacts with learners' high workload leading to a reduction in FSB. Although timing and frequency of feedback has been examined in the medical education literature, previous studies concentrated on feedback efficacy, rather than its impact on FSB.[32] As such, this is a unique finding that can inform curricula development above and beyond the e-portfolio setting within which a study sits.

As with all studies, our research has limitations. Firstly, the data has been collected at a single institution in a single country so caution must be taken for the transferability of our findings. For example, as we have highlighted, the face-saving effect might be exaggerated within a Taiwanese culture. Secondly, we have used a qualitative individual interview method. Such face-to-face data collection might motivate participants to present themselves positively. We are therefore careful not to quantify our data, and make no claims regarding the relative importance of factors and the magnitude of their influence. However, our study has strengths. The setting in which it was conducted is the largest teaching hospital in Taiwan, we have a relatively large participant group and have used theory to facilitate the transferability of findings within a medical education context.

Our study has implications for educational practice. Providing learners with information on how to address their learning needs, thus facilitating the relevance of their reflective writing, could result in higher levels of FSB. Faculty development focusing on the provision of relevant, focused and high-quality feedback, is recommended. We also advise e-portfolio developers to work with students and educators when developing their user systems. Finally, the implementation of an e-portfolio should be considered in the wider context of both learners' and teachers' existing workload and opportunities for face-to-face feedback to ensure that the timing and frequency of feedback does not impede learners' FSB or create additional work for busy teachers and their trainees.

Our research also highlights the need for further work in terms of researching learners' FSB within healthcare settings. In an era in which feedback studies are prevalent, too much attention has been placed on the efficacy and the delivery of the feedback itself, rather than

learners FSB, which is assumed to occur. However, this is not always the case. Without fully understanding the relative factors that facilitate and impede learners' FSB across a range of learning situations, the goals of feedback in healthcare education cannot be fully achieved.

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Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

No. Item	Guide questions/description	Response / Reported on Page #
Domain 1: Research team and reflexivity		
Personal Characteristics		
1. Interviewer/facilitator	Which author/s conducted the interview or focus group?	***See 'data collection' in Methods (page 9)***
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	***See title page (page 1)***
3. Occupation	What was their occupation at the time of the study?	***See title page (page 1)*** REN-HUEI FU is general practitioner at Chung Gang Memorial Hospital, Department of Neonatology; medical educator at Chung Gang Medical Education Research Centre (CG-MERC), Linkou, Taiwan. YU-HSUEH CHO is a Master of Chinese Medicine and researcher of the CG-MERC, Chang Gung Memorial Hospital, Linkou, Taiwan. QUATTRI FRAN, PhD, is a linguist and Post-Doctoral Researcher at the CG-MERC, Chang Gung Memorial Hospital, Linkou, Taiwan. MONROUXE LYNN, PhD, is a cognitive psychologist and Director of CG-MERC, Chang Gung Memorial Hospital, Linkou, Taiwan.
4. Gender	Was the researcher male or female?	**KHF:** Male **LVM, FQ, YHC:** Female
5. Experience and training	What experience or training did the researcher have?	**LVM** has vast experience of conducting qualitative research and analysis (over 15 years each). **FQ** has previous experience in qualitative research and analysis. **KHF** has previous experience in research but not qualitative **YHC** had training in interviewing LVM supported the team throughout the analysis, coding and writing process.
Relationship with participants		The interviewer, **YHC**, and **LVM** and **FQ** had no prior relationship with the students **KHF** (who was not present during interviews) had a role in developing the e-portfolio
6. Relationship established	Was a relationship established prior to study commencement?	***See 'Design' in Methods (page 9)***
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	***See Data Collection section in Methods (page 10)***

8. Interviewer characteristics	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	***Described on page 9***
Domain 2: study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	***See 'Design' in Methods (page 9).*** We used a qualitative interview design, we explain our analytical process.
Participant selection		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	***See 'recruitment' in Methods (page 9).*** Participants were self-selected using purposive sampling. All participation was voluntary.
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	***See 'data collection' in Methods (page 9).***
12. Sample size	How many participants were in the study?	***See 'Participants' in Methods (page 9)*** "Participants comprised n=71 PGY1 (60% of cohort; 66% male)"
13. Non-participation	How many people refused to participate or dropped out? Reasons?	Participation was voluntary and participants were not considered to take part until they participated in the interviews. No participants withdrew from the study after participating in interviews.
Setting		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	***See 'Data collection' in Methods (page 9)*** "Interviews were conducted in a quiet room at participants' convenience." –
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	***No***
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	***See 'Participants' (page 9)*** The gender has been reported.
Data collection		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	***See 'Data collection' in Methods (page 9)***
18. Repeat interviews	Were repeat inter views carried out? If yes, how many?	***No***
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	***See 'Data collection' in Methods (page 9)***
20. Field notes	Were field notes made during and/or after the interview or focus group?	***None made.***
21. Duration	What was the duration of the interviews or focus group?	**Individual semi-structural interview, 20-30 min each, "procedure" page 11**
22. Data saturation	Was data saturation discussed?	We do not report this as we do not consider this to appropriate for our research position (Varpio L, Ajjawi R, Monrouxe LV, O'Brien B,

		Rees CE (2017) Shedding the cobra effect: problematising thematic emergence, triangulation, saturation and member checking. Medical Education. 51(1)40-50.)
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	We do not report this as we do not consider this to appropriate for our research position (Varpio L, Ajjawi R, Monrouxe LV, O'Brien B, Rees CE (2017) Shedding the cobra effect: problematising thematic emergence, triangulation, saturation and member checking. Medical Education. 51(1)40-50.)
Domain 3: analysis and findings		
Data analysis		
24. Number of data coders	How many data coders coded the data?	***See 'Data analysis' in Methods (page 10)***
25. Description of the coding tree	Did authors provide a description of the coding tree?	***See Results Section, Table 1 (page 10)***
26. Derivation of themes	Were themes identified in advance or derived from the data?	***See 'Data analysis' in Methods (page 9)*** Themes were inductively and deductively developed.
27. Software	What software, if applicable, was used to manage the data?	***See 'Data analysis' in Methods (page 9)***
28. Participant checking	Did participants provide feedback on the findings?	We do not report this as we do not consider this to appropriate for our research position (Varpio L, Ajjawi R, Monrouxe LV, O'Brien B, Rees CE (2017) Shedding the cobra effect: problematising thematic emergence, triangulation, saturation and member checking. Medical Education. 51(1)40-50.)
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	***Yes***.
30. Data and findings consistent	Was there consistency between the data presented and the findings?	We have ensured consistency between the data presented and the findings of the study through thoroughly reviewing the manuscript.
31. Clarity of major themes	Were major themes clearly presented in the findings?	***See 'Results' (page 10-17)*** The results section is organized around the major themes of the study, which are described under specific headings.
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	***See 'Results' (page 10-17)*** The results section includes discussion of major themes, and nuances within these were covered.