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Understanding struggling students: a thematic analysis from the self-regulated learning perspective

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Abstract

Context

Students who engage in reflective, self-regulated learning (SRL) are more likely to have academic success, whereas students who have deficits in SRL tend to struggle with academic performance. Understanding how SRL is used by struggling medical students will inform development of better remediation.

Methods

Semi-structured interviews were conducted with 55 students who had failed the final re-sit assessment at two medical schools in the UK to explore their use of SRL. A thematic analysis approach (TA) was used to identify factors from the lived experience of students who failed at high stakes assessment that prevented them from appropriately overcoming failure.

Results

Struggling students had inappropriate learning strategies as well as inflated beliefs and expectations about their performance on the course. Their adjustment after a failed assessment was restricted by the coping strategies they used to deal with the failure experience, which included normalising the experience and externally attributing reasons for failing. These strategies were a barrier to taking up formal support and seeking informal help from peers.

Conclusions

This study identified that struggling students had problems with SRL, thereby entering a cycle of failure due to limited attempts to access formal and informal support. The findings have implications for how medical schools can provide remediation opportunities for struggling students. Implications for how medical schools can create a culture that supports uptake of SRL and help-seeking, and improve remediation for struggling students are discussed.

Background

The attitudes, behaviours, and approach to learning adopted by students have an impact on their academic outcomes at medical school. An important aspect is the

extent to which struggling students use a self-regulated learning (SRL) approach(1).

Previous research has shown that students who engage in SRL are more likely to succeed(2) on a given task, whereas students who have deficits in SRL generally have worse academic outcomes(3,4).

Socio-cognitive researchers consider that SRL is a cyclical process in which the key components are goal-setting, strategy selection, self-monitoring, reflection and adaptive change. The setting of learning goals is important for success on a learning task since they serve to motivate and direct students' attention on specific aspects of the process or outcome of learning(5). 'Outcome' goals tend to emphasise the final products of learning, such as an examination grade, whereas 'process' goals involve the steps, procedures or strategies that one employs to learn a task(6). Although outcome goals can exert positive motivational and regulatory effects, process goals are particularly beneficial in situations when students are first learning how to perform a task or skill or when they struggle to master the task(5).

A strategy, or combination of them, is necessary for achieving goal(s) in a task. Strategies include those aimed at regulating motivation for the task and those aimed at maximising the acquisition of information or learning to complete it successfully. Training students to become strategic thinkers is a central component of most academic self-regulation intervention programmes, regardless of academic content or age of the students(5).

The skill of adjusting a strategy or approach and adapting to any challenges or obstacles faced during a task is also important. Self-monitoring and self-evaluation are active processes whereby the learner reflects upon their strategy, adapting to the changes as necessary, in the pursuit of their goals. Self-generated feedback and feedback from external sources, such as comments from observers of their performance, provides essential information for these processes. Unfortunately, low-performers present a particular challenge during remediation since they often possess difficulties with generating their own internal feedback and ignore external feedback about their performance(7).

Whilst self-monitoring and self-evaluation are important, the reasons learners attribute to success or failure on a task are also critical for effective modification and adaption to occur. Researchers have shown that when students struggle to succeed or encounter challenges during learning, those who make internal, unstable and controllable attributions, such as effort and strategy use, tend to be high achieving and adaptive in their persistence and use of strategies(8,9).

As well as the cognitive processes associated with learning or completing a task, motivational and emotional influences on the learner are important for effective SRL. Socio-cognitive theorists place particular importance on self-motivation beliefs, such as expectancy and value (10) since both direct learner behaviour. It follows that learners' beliefs about the value of studying for a particular subject also affect their level of motivation(11).

Feedback is inherent in and a prime determiner of processes that constitute SRL (12). Ideally the aim of giving feedback is to analyse the cognitive processes involved in SRL (12) around a learning tasks and gain engagement from the learner by offering

information that empowers the individual to strengthen aspects in need of improvement (13). Despite the recognition that feedback is a critical component of undergraduate medical education and indeed medical education (14), the perceptions of students about the effectiveness of feedback in the academic and clinical context are poor (15-17). There is a lack of understanding about the perceptions of medical students who repeatedly fail on the course about the quality of feedback for meeting their perceived needs or improving SRL behaviours.

Despite the association between appropriate SRL and higher academic outcomes (2-4), there are few descriptions of learning or feedback interventions informed by SRL theory for students who struggle with assessment at medical school. A cognitive skills programme based on SRL implemented in a group-based setting demonstrated improved outcomes for students who failed at the very start of medical school (1), however there is little evidence about the effectiveness of such theory-driven interventions for addressing specific self-regulatory problems at the individual level. Students who lack insight into their situation and fail to engage with remediation support present the greatest challenge to medical teachers responsible for remediation(18). There is evidence that students fail to accept help even after agreeing to do so via a learning contract (19), therefore preventing themselves from accessing the very support intended to help them in remediation. This behaviour further highlights the importance of understanding the impact of poor SRL and responses to failure on adjustment and engagement with remediation.

The research question this study set out to answer was ‘to what extent does poor SRL contribute to the maladaptive responses of students who struggle at high-stakes assessments and predispose students to a cycle of failure across a medical course?’ Identifying the reasons why students are not able to respond adaptively to failure is critical if medical schools are to develop appropriate theory-driven strategies for remediation and overcome barriers presented by the students themselves.

Methods

The educational context

The study was conducted in two UK medical schools. Both offer a five-year undergraduate and a four-year graduate entry course. For the five-year programmes, both universities follow a traditional format of lecture-based teaching followed by clinical teaching. For the four-year course, one school uses a problem-based learning approach, the other uses an accelerated version of the five-year course.

The sample

All students who failed their final year exams and any re-sits during the five year study period, and were undergoing a period of formal remediation, were emailed an invitation to participate. Students were informed that involvement was voluntary and not a formal requirement by either medical school as a consequence of the failure. A formal consent procedure was undertaken after students were given background information sheets about the study. Students confirmed their

agreement to attend a one-to-one interview with a member of the research team, and to allow the interviewer to record the discussion on a digital recorder and disseminate the findings of the research as appropriate.

Data collection

In depth semi-structured interviews(20). were conducted with each participant by the research team within the first two months of the remediation period at both medical schools. Interviewees were encouraged to tell their 'stories' about any failures along the course, culminating with the failing experience at finals. Interviewers allowed participants to discuss topics and issues most relevant to them, as well as explored key aspects associated with assessments and failure, such as their:

- Expectations of getting through assessments
- Preparation for assessments
- Perceptions about preparing for, going into and coming out of assessments
- Circumstances of failures including the feelings associated with the failing grade
- Perceptions of the medical school response to failure
- Support available and taken up following failure
- Perceptions about what helped or hindered following failure

The interviews were scheduled for sixty-ninety minutes in duration, nevertheless the interviewer checked participants were happy to continue in the event the discussion exceeded sixty minutes. The interviews were recorded on a digital recorder with the consent of participants and transcribed verbatim. Notes were taken immediately following the interviews as appropriate. Participants interviewed in the first year of the study also participated in two focus groups, to test emergent themes.

Analysis

This study used a thematic analysis approach to identify factors from the lived experience of students who failed at high stakes assessment that prevented them from appropriately overcoming failure through the lens of SRL. Thematic analysis (TA) is a pragmatic approach to qualitative analysis that involves searching for patterns or themes across an entire data set. While drawing on some of the techniques of established methodologies such as grounded theory, TA remains theoretically flexible, and can be adapted to suit the specific context of a particular study. Importantly, TA can incorporate either inductive and deductive strategies, enabling analysis to be explicitly informed by pre-existing theories or frameworks.

Data were analysed using a thematic analysis approach(21), informed by sensitizing concepts(22) drawn from self-regulatory theory(23). In contrast to 'definitive' concepts, sensitizing concepts do not involve using 'fixed and specific procedures' to identify a set of phenomena, but instead give 'a general sense of reference and guidance in approaching empirical instances'(22). The analysis aimed to explore the motivational, emotional, and behavioural dimensions of students' reactions to

failure.

Data from the first seven transcripts were open-coded, then codes were inspected and compared across transcripts to generate higher-order themes. A thematic framework was developed, and refined and validated in the focus group sessions.

This thematic framework was applied systematically to code data collected during the first two years of the study, and was revised during coding to incorporate new emergent codes and themes. Data from subsequent years were only coded where new themes emerged. Coded data were summarised into charts, which were used to describe themes and relationships between themes.

Ethics

The University of Leicester Committee for Research Ethics Concerning Human Subjects granted ethical approval for the study (rp299-B4900), and reciprocal agreement was received from the University of Nottingham (EMCUF 6 26062013 SoM MEU).

Results

69 students across the two medical schools were invited to participate in the study. Interviews were conducted with 55 students over 5 years (Table 1,Table 2). Nine of these students also took part in two focus groups.

Demographics	***Number of participants***
Male	35
Female	20
UK born	39
Non-UK born	16
School leaver	44
Graduate	11
Medical school A	40
Medical school B	15

Table 1 Demographics of participants

Year of study	*Number of participants*
1	7
2	14
3	13
4	11
5	10

Table 2 Number of participants recruited in each year of the study

Although a substantial number of health and personal problems affected the participants, these will be reported else (24) and this study focused on the academic difficulties that these students encountered before or after failure.

Struggling medical students responded, from a SRL perspective to failing assessments across their course in a varied and complex way. However, four main themes were identified: (1) Inappropriate selection of learning goals and strategies; (2) Responding to failure by normalisation and external attribution; (3) Lack of seeking and acceptance of support; formal and informal; (4) Protecting self-worth.

In the quotations given below, students' names have been replaced by anonymising coding to protect confidentiality.

(1) Inappropriate selection of learning strategies, goals and expectations

Learning goals

Students were driven by outcome-based goals such as 'getting through the exam', rather than process-orientated goals such as developing effective study techniques.

> *I just went into the exam thinking all I want to do is pass, I don't want an excellent or anything extra, just pass so I can concentrate on the next one (P14)*

Learning strategies

When describing their approach to learning in preparation for assessment, students cited using inappropriate strategies throughout the course. Inappropriate learning strategies included rote memorising facts when deeper learning of concepts was more appropriate prior to short-answer question written assessments or repeatedly practicing 'normal' clinical examinations when seeking opportunities for interpreting clinical signs was more appropriate prior to clinical assessments.

> *I walk around and I memorise paragraph by paragraph. I read about four times and I learn it by heart […] I'm extremely brilliant over learning by heart (P6)*

Whilst some recognised the need for engaging in deep learning as a future doctor, the majority resorted to strategic, surface learning for managing the volume and complexity of material on the course.

> *It seemed to be more of a superficial coverage and I think that was quite unsettling for me […] 'cos you'd like to feel like you've done module, done and dusted, and I never kind of got that feeling with a lot of them (P36)*

It was common for students to believe they deserved to pass at assessment because of the effort invested into preparing for it. Students inappropriately confused the quality or ability required to pass assessment with the quantity of effort used to prepare for assessment.

I have to work hard to get good grades, I'm not naturally clever like some of the others on the course. They read something once and just get it whereas I know what I have to do and I just get on with it (P34)

(2) Responding to failure: normalisation and external attribution

Normalisation of failure

Some students normalised failures by drawing on the belief that many people struggled and failed on the course. Whilst normalising failure in this way enabled them to cope better with the experience, it could result in trivialisation of failure and overlooking the need to seek help.

I think for a lot of people when you come to medical school it's probably the first time you've ever had a set back in [the] education part of your life, so it was a bit of a shock. But I just thought [the] first year was just a hard year and people did say sometimes your first year is your hardest year, so I just went with it really, I didn't really think to seek any help (P4)

Inaccurate self assessments were formed by students as individuals set about dismissing any label of 'failure' that came with not getting through assessments or contradicted with their inflated self-perceptions about their own ability.

At your school you were probably one of the cleverer people … not cleverer but you know, [one of] the ones that did well at school erm …you know you're used to being up there …so maybe [failing] was just one of those things (P42)

These students believed they were always "just one mark away" (*P6*) so interpreted feedback from external sources in a way that complimented this perspective and included an element of misfortune.

It wasn't a big gap that I was missing … I asked the guy and he goes 'oh you know it's unfortunate but you know you should be fine in the in the qualifier' and stuff (P49)

Not only were students unable to perform an accurate self-assessment about themselves, but they were also unable to judge the performance of others.

I revised really hard compared to other people that I knew that got through. I am a bit disappointed that I've come in the […] bottom seven of the year, because I don't think I deserve to be there (P5)

External attribution

It was commonplace for students to explain away failures with reasons that were outside of their control such as an '*unfair exam*' (*P26, P32 , P48*), '*mean examiners*' (*P47*) or '*bad luck on the day*' (*P41*), rather than critically reflecting on themselves and their own learning (25). Avoiding placing the blame upon themselves protected students' self-esteem and well-being in the short-term but presented faculty with the larger problem of resistance to change. Many students clung on to their existing learning strategies based on the fact that they were associated with success in the past and the recent failures were perceived as not their fault.

In terms of changing my style drastically, I don't think [I needed to] because it

got me through the five years; it got me through A Levels; it got me through GCSEs. (P5)

Although students reported receiving feedback on their performance, they were often unable to do anything with it if it was insufficient for them to understand how to the remedy their errors or it contradicted with their self-beliefs.

All they do is give you a list of the topic areas which came up, with a load of scores that tell you if you got the questions right or wrong. He tells you that you need to learn more about this or learn more about that, but never tells you how to do it. I don't find that useful. (P15)

Students externally attributed reasons for success or failure with the medical school being frequently blamed after failing episodes. Students were critical about the curriculum design and its delivery, as well as the methods used for assessment.

You've been taught in a modular scheme [...then] you're suddenly presented with the bigger picture which is called human beings, who come with all their idiosyncrasies and all their problems and they're not textbook-like. If you haven't been told how to integrate, how can you be expected to then do it? (P33)

Students also blamed the medical school for failing to identify they needed support and questioned the choice of support in the event it was provided by faculty.

I always knew it took me longer to get a concept […] but things got bad in the second year. They sent me to student services and I got tested. That's when they found out I had a disability. It all made sense after that but why didn't they find it out sooner? Giving me more time may have helped but there was no support on the wards and no support for the clinical exams (P35)

Some students argued that the medical school had failed to deliver on the implicit contract with their students, and as such, should be seen as having accountability for their failure.

They're service providers [and] we enter into a contractual agreement with them regardless of whether we sign a contract or not. By virtue of the fact that they take money from us, they're obliged to provide a service of a particular quality, a particular standard. And if they say they're gonna do something they need to do that. So where is their accountability to us? (P33)

(3) Lack of seeking and access to support: formal and informal

Formal support

Students felt there was a tension between the medical school's role in monitoring their progress and sanctioning poor performance, and the provision of support. Students were highly motivated to avoid being 'noticed' by the medical school, and being identified as a problem student. They were concerned that being labelled as such could have repercussions for their future studies or career.

I do sort of feel as though sometimes you're better just to put your head down, do your work and you know come out the end of it with your degree, and really nobody ever sort of ever met you or nobody really knows you. You haven't got

that little black flag (P1)

The concern was compounded by students' experiences of the medical school's response to failure as punitive rather than supportive, as well as the perceived threat of expulsion from the course.

> *When we arrived they had this constant thing about if you fail this, this and this then course termination […] and I think it does really quite scare you (P26)*

Although students have access to a personal tutor system, there was some concern that this could act as a means for the medical school to police the student body. This was a significant barrier for some students in accessing pastoral support, which may have helped them cope with any issues associated with the failure experience.

> *I did [go to my personal tutor] but kind of always felt there was always an issue of trust. […] How much of this is a degree of policing rather than true help? That's what it felt like, so no I didn't feel comfortable using the personal tutor system that much (P33)*

This meant that for many students, the official channels of support available to them through the medical school were 'off limits'.

Peer support

Students were often more willing to draw on their peers as sources of support. Some had benefitted from peer-to-peer support offered by individuals who volunteered their help. Failing students were quite strategic in how they used this support: their goals focused on finding out what they needed to do to get through re-sit assessments.

> *I worked closely with another girl who had passed the exams [and she] was doing a little revision session for the ones that didn't [pass]. There wasn't a great of difference in the knowledge but we were hoping that she could guide us as to what areas needed to be focussed on (P2)*

There were, however, problems with relying on peers. One issue was that failing students often looked to other failing students for support. This could provide a valuable source of emotional support, but limited students' opportunities to develop new and more effective study skills.

> *A small group of us got together and worked for the re-sit. We all knew each other and I'd met them before in the first year when I had to do the qualifier. It was more about us knowing what we had to do to get through and we all supported each other to do that (P36)*

In addition, not all students were able to access peer support. Some students experienced the culture among medical students as competitive and divisive; they felt that by not being 'in' with the right people they were denied resources and support that others had access to.

There's only one place you can go to get the information and that's from the people in the year above because they're not in direct competition with you. (P2)

Protecting self-worth

Rather than focus on reflecting over knowledge gaps or optimising learning strategies after failing, students were more concerned with protecting their well-being. Some students worried about their self-worth and were unwilling to learn by trying things differently. Some avoided the embarrassment of being seen to struggle and so did not gain from the feedback available from practising skills in front of others.

I didn't really talk to my friends, especially in the first three years. […] I was just going through it myself and I think maybe that's what I did wrong. Maybe if I had gone through it with other people then they would have asked 'why are you learning that' or 'you can learn it in this way' (P4)

Discussion

To the best of our knowledge, this is the first multi-site study explicitly exploring how medical students respond emotionally and cognitively to failing their examinations through the lens of self-regulated learning.

Whilst low-performers struggle integrating new with existing knowledge during their learning (26) or applying their basic science knowledge in practice (27), this study also suggest poor-SRL also impacted response to failure. The findings demonstrate that poor-SRL behaviours such as normalising failure, a lack of reflection-on-action and external attribution of failure (Figure 1) prevented students from overcoming failure appropriately and effectively confined them to a cycle of repeated failure.

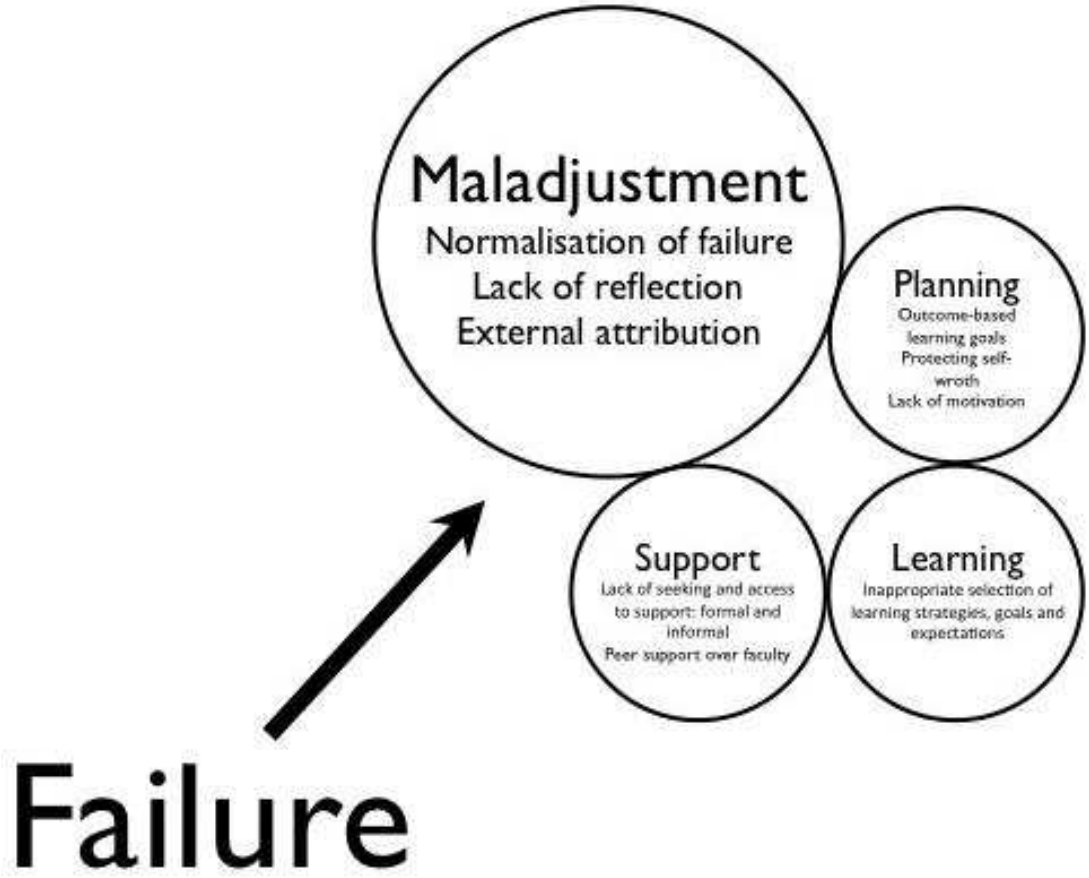

Figure 1 A model of poor self-regulation leading to academic failure and a potential vicious cycle for condemning at-risk students to a future failure at medical school

Cleland *et. al* (28) observed that students who struggled with high-stakes assessments failed to attend additional clinical practice (ACP) despite agreeing to do so via a learning contract beforehand(28). Research has also shown that a major concern for students who repeatedly struggle with learning tasks is to protect their well-being, and avoid challenging learning conditions (29) perceived as threats to them. This study suggests the reason why students in remediation may fail to take up teaching opportunities organised for their benefit are complex and associated with behaviours that attempt to protect self-worth and 'save face' in front of others such as normalising failure or non-attendance.

There is also a relationship between the causal attributions of learners and academic performance, with the most damaging consequences being when individuals perceived the causes of their academic failures as being uncontrollable, and attributable to external or global causes(30). This study suggests that causal attributions are not just associated with academic performance, but also potentially the actions taken by the students in their learning prior to, and after assessment. The 'double curse' of being 'unskilled and unaware of it' was first reported by Kruger and Dunning(7) and describes the propensity to adverse academic outcomes by low performers from a lack of self-assessment skills. This study suggests the tendency by students in difficulty to external attribute reasons for failing also leads to another 'double jeopardy'.

Students avoiding the medical school for help and refusing to attend remedial

teaching ultimately amounted to a pair of academic self-handicapping behaviours. The exact reasons why students behaved in ways in this study remain unclear, however this study suggests maladaptive behaviours such as avoiding help-seeking, resisting changes to learning strategies and striving to just 'get the answer' (31) may be responsible. The findings also suggest these behaviours get reinforced over time and confine individuals to a repeated cycle of failure so require a new approach to remediation from clinical teachers and medical educators to break the pattern (32).

Strengths and limitations

This study was a two-centre study was a large number of participants compared to other studies exploring the phenomenon of underperformance or failure at medical school. This study also addresses an important issue in the literature and that is the very small sample sizes in studies exploring or addressing remediation in medical education(32). Inviting participants across two centres and four programmes ensured the findings represented the diversity of the failure phenomenon across undergraduates and graduates as well as among different types of medical student on contrasting programmes.

A retrospective study design was necessary since students could only be interviewed after experiencing failure and time period between failing and the interview necessary for ethical reasons as students needed time and privacy. Furthermore, waiting until remediation also provided sufficient time for students to reflect whereas interviewing individuals in the immediate aftermath of failure may have captured a pure emotional reaction only.

Implications for policy, practice and further research

Helping failing students to remedy their approaches to learning is very challenging for medical schools as the barriers are many and varied. Considerations need to include the dynamics of how students work to protect their identity and cope with the emotion al sequelae associated with failure; their relationship with their medical school and the culture within it. Acknowledging the potential for failure, and preparing students to deal with it may offer a more effective way to address the problem. For example, using role-play to explore experiences of failure early in the course may prevent behaviours from becoming established (33).

Students should be reminded about their responsibility to see help-seeking as professional duty (34) and medical schools should champion help-seeking as a valued and positive activity. It is critical that medical schools work to create a more open and less punitive culture around responding to failure so the right students are given 'an arm around the shoulder' whilst others appropriately receive 'a nudge in the right direction'.

The delivery of two or more personalised approaches to support is difficult to organise at a systems level. Furthermore, the various dual roles the medical school has to fulfil - punitive and support, assessor and developer - conflict and compete with each other. Whilst medical schools must ensure they only graduate safe and competent doctors (35), they also have a duty of care to support students develop through the course of their education (35). These are competing interests but

necessary nonetheless given the inherent role of medical schools in the processes of education and regulation.

Whilst external pressure from regulators largely dictate the standards for assessment, Medical School could focus more on the development role its plays in the context of preventing failure. Changing students' perceptions that the medical school is 'watching them' in a punitive rather than a supportive manner is vital for improving the early detection of 'at risk' students by personal tutors. The personal tutor system was overlooked by many of the students who failed, therefore more awareness and transparency about the role of the personal tutor for students is necessary. Making peer-support mainstream might allow the benefits that students experience to be more accessible(36,37), since recognition is given to individuals who demonstrate effective self-regulatory behaviours and act as mentors or 'buddies'(38,39) for students who fail.

The strained relationship between the medical school and students who fail at assessment is a barrier for delivering effective support (28) therefore exploring innovative ways to nurture the relationship in the aftermath of failure is necessary.

The delivery of feedback after failure is fraught with difficulty since giving feedback should not undermine self-esteem (40), yet there is still the need to 'break bad news' and reveal the full extent of underperformance to the individual, particularly in those individuals with inflated self-perceptions. Whilst students 'may not hear it' from the medical school, the findings from this study suggest they appear willing to seek help from trusted others, so equipping all students as with mentoring skills may be an effective methods for promote SRL behaviours (41). This may also extend to developing peer-support systems or new approaches to proactively seek out those in need of the help the most. Further understanding about the infrastructure and culture necessary for remediation to proceed effectively is also needed.

Author information

The idea for the study was developed by RP. The interviews were conducted by SB and RP. SB, CT and RP analysed the data. All authors (RP, CT, SB, JY and JS) contributed to the final manuscript and approved the final version.

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References

(1) Winston KA, Van Der Vleuten CPM, Scherpbier AJJA. At-risk medical students: implications of students? voice for the theory and practice of remediation. Med Educ 2010;44(10):1038-1047.

(2) Zimmerman BJ, Schunk DH. Reflections on theories of self-regulated learning and academic achievement. In: Zimmerman BJ, Schunk DH, editors. Self-regulated learning and academic achievement: Theoretical perspectives. 2nd ed. Mahwah, NJ: Erlbaum; 2001. p. 289-309.

(3) Langendyk V. Not knowing what they do not know: self-assessment accuracy of third year medical students. Med Educ 2006;40:173-179.

(4) Artino A, Hemmer P, Durning S. Using self-regulated learning theory to understand the beliefs, emotions, and behaviors of struggling medical students. Acad Med 2011 Oct;86(10 Suppl):S35-8.

(5) Sandars J, Cleary TJ. Self-regulation theory: Applications to medical education: AMEE Guide No. 58. Med Teach 2011 11/01; 2012/03;33(11):875-886.

(6) Zimmerman BJ, Kitsantas A. Self-regulated learning of a motoric skill: The role of goal setting and self-monitoring. Journal of Applied Sport Psychology 1996 03;8(1):60-75.

(7) Kruger J, Dunning D. Unskilled and unaware of it: How difficulties in recognizing one's own incompetence lead to inflated self-assessments. J Pers Soc Psychol 1999 12;77(6):1121-1134.

(8) Cleary TJ, Zimmerman BJ. Self-regulation differences during athletic practice by experts, non-experts, and novices. Journal of Applied Sport Psychology 2001 06;13(2):185-206.

(9) Cleary TJ, Zimmerman BJ, Keating T. Training physical education students to self-regulate during basketball free throw practice. Research Quarterly for Exercise & Sport 2006 Jun;77(2):251-262.

(10) Wigfield A, Eccles J. Expectancy-Value Theory of Achievement Motivation. Contemporary Educational Psychology 2000;25:68-81.

(11) Kuhl J. Volitional aspects of acheivement motivation and learned helplessness: towards a comprehensive theory of action control. In: Maher BA, editor. Progress in Experimental Personality Research New York: Academic Press; 1984. p. 99-171.

(12) Butler DL, Winne PH. Feedback and self-regulated learning: A theoretical synthesis. Review of Educational Research 1995;65(3):245-281.

(13) Boud D, Molloy E. Rethinking models of feedback for learning: the challenge of design. Assessment & Evaluation in Higher Education 2013 09/01; 2014/08;38(6):698-712.

(14) Harden RM, Laidlaw JM. Be FAIR to students: Four principles that lead to more effective learning. Med Teach 2013 01/01; 2014/08;35(1):27-31.

(15) Cantillon P, Sargeant J. Giving feedback in clinical settings. BMJ 2008 Nov 10;337:a1961.

(16) Daelmans HEM, Hoogenboom RJI, Donker AJM, Scherpbier AJJA, Stehouwer CDA, van dV. Effectiveness of clinical rotations as a learning environment for achieving competences. Med Teach 2004 01/01; 2014/08;26(4):305-312.

(17) Al-Mously N, Nabil NM, Al-Babtain SA, Fouad Abbas MA. Undergraduate medical students' perceptions on the quality of feedback received during clinical rotations. Med Teach 2014 Apr;36 Suppl 1:S17-23.

(18) Hays R. Remediation and re-assessment in undergraduate medical school examinations. Med Teach 2012 02/01; 2013/11;34(2):91-92.

(19) Cleland JA, Milne A, Sinclair H, Lee AJ. Cohort study on predicting grades: is performance on early MBChB assessments predictive of later undergraduate grades? Med Educ 2008 Jul;42(7):676-683.

(20) Denzin NK, Lincoln YS. Collecting and interpreting qualitative materials. Thousand Oaks, CA: Sage Publications; 1998.

(21) Bovatzis R. Transforming qualitative information: Thematic analysis and code development. Thousand Oaks, CA: Sage; 1998.

(22) Bowen GA. Grounded theory and sensitising concepts. International Journal of Qualitative Methods 2006;5(3):12-23.

(23) White CB, Gruppen LD. Self-regulated learning in medical education. 2007.

(24) Patel RS, Tarrant C, Bonas S, Shaw RL. Medical students personal experience of high-stakes failure: case studies using interpretative phenomenological analysis. Unpublished data. Submitted for publication .

(25) Heider F. The psychology of interpersonal relations. Hillsdale, NJ: Lawrence Erlbaum Associates Inc.; 1958.

(26) O'Brien B, Cooke M, Irby DM. Perceptions and attributions of third-year student struggles in clerkships: do students and clerkship directors agree? Acad Med 2007 Oct;82(10):970-978.

(27) Newman DL, Catavero CM, Wright LK. Students fail to transfer knowledge of chromosome structure to topics pertaining to cell division. CBE Life Sci Educ 2012 Winter;11(4):425-436.

(28) Cleland JA, Arnold R, Chesser A. Failing finals is often a surprise for the student but not the teacher: identifying difficulties and supporting students with academic difficulties. Med Teach 2005 Sep;27(6):504-508.

(29) Boekaerts M. Self regulation and effort investment. In: Renninger KA, Sigel IE, editors. Handbook of child psychology: Child psychology in practice. 6th ed. Hobokon, NJ, US: John Wiley & Sons; 2006. p. 345-377.

(30) Kistner JA, Osborne M, LeVerrier L. Causal attributions of learning-disabled children: Developmental patterns and relation to academic progress. J Educ Psychol 1988;80(1):82-89.

(31) Newman R. How self-regulated learners cope with academic difficulty: The role of adaptive help seeking. Theory Into Practice 2002;41(2):132-138.

(32) Cleland J, Leggett H, Sandars J, Costa MJ, Patel R, Moffat M. The remediation challenge: theoretical and methodological insights from a systematic review. Med Educ 2013 Mar;47(3):242-251.

(33) Tough P. How children succeed: Grit, curiosity, and the hidden power of character. Boston, MA: Houghton Mifflin Harcourt; 2012.

(34) The General Medical Council. Tomorrows Doctors. 2009.

(35) The General Medical Council. Tomorrow's Doctors. 2009.

(36) Topping KJ. Trends in peer learning. Educational Psychology 2005 12;25(6):631-645.

(37) Cushing A, Abbott S, Lothian D, Hall A, Westwood OM. Peer feedback as an aid to learning--what do we want? Feedback. When do we want it? Now! Med Teach 2011;33(2):e105-12.

(38) Ashgar A. Reciprocal peer coaching as a formative strategy. Assessment and Evaluation in Higher Education 2010;35(4):403-417.

(39) Dick J. Medical students and peer-support: a discussion based on findings from a BMSc research project. Scottish Universities Medical Journal 2012;1(1):14-22.

(40) Kluger AN, DeNisi A. The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. Psychol Bull 1996 03;119(2):254-284.

(41) Sandars J, Patel RS, Steele H, Mcareavey M. Developmental student support in undergraduate medical education: AMEE Guide No. 92. Med Teach 2014 Jul 29:1-12.