

# **The struggling student: a thematic analysis from the self-regulated learning perspective**

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## **Abstract**

### **Context**

Students who engage in self-regulated learning (SRL) are more likely to have academic success, compared with students who have deficits in SRL and tend to struggle with academic performance. Understanding how poor SRL affects the response to failure at assessment 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 processes. A thematic analysis approach (TA) was used to identify the factors, from an SRL perspective, that prevented students from appropriately and adaptively overcoming failure, and confined them to a cycle of recurrent failure.

### **Results**

Struggling students did not utilise key SRL processes, resulting in inappropriate choices of learning strategies for written and clinical formats of assessment, and maladaptive coping strategies to failure. Their use of normalisation of the experience and external attribution of reasons for failure 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. Implications are discussed for how medical schools can create a culture that supports help-seeking and the development of SRL, and improves remediation for struggling students.

## 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 do not fully utilise SRL processes 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 have 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, 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 enabler for, SRL processes (12). Feedback for

improving self-regulated learning requires some analysis of the cognitive processes involved in SRL (12) and learners to engage with learning in areas that need improvement (13). Despite the importance of feedback for facilitating improvements in SRL, students perceive the effectiveness of feedback in academic and clinical contexts to be poor (14-16). What remains unclear is whether these perceptions relate to feedback at the level of the task (i.e. what students got wrong at assessment), or whether they relate to feedback about around aspects of self-regulated learning (i.e. generic learning skills or strategies). In particular, there is a lack of understanding about the perceptions of medical students who repeatedly fail despite this group of individuals having the most to gain from this type of feedback.

The association between appropriate SRL and higher academic outcomes is well recognised (2-4), but there are few descriptions of SRL interventions for students who struggle with assessment at medical school. Although 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), there is little evidence about the effectiveness of similar SRL theory-driven interventions for addressing problems at the individual level towards the end of medical school. Students who lack insight into their situation and fail to engage with remediation support present the greatest challenge to medical teachers responsible for remediation (17). These students fail to accept help even after agreeing to do so via a learning contract (18), therefore preventing themselves from accessing the very support intended to help them in remediation. This behaviour further highlights the importance of understanding how SRL impacts on the response to failure and the individual's engagement with remediation.

The research question this study set out to answer was ‘to what extent does failure to utilize appropriate 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, although the courses are different across the two sites. Similarly, for the four-year course, there is difference between the two courses in that one school uses a problem-based learning approach and 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 (19) 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 explore 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. Two focus groups were held with participants who had been interviewed in the first year of the study, to test and validate the 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 (20).

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 all data collected during the first and second year of the study, and revised to incorporate new emergent codes and themes as appropriate. Data from subsequent years were subject to selective coding to develop themes and check for saturation (24). 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 focus groups.

**Table 1 Demographics of participants**

<i><b>Demographics</b></i>	<i><b>Number of participants</b></i>
Male	35
Female	20
UK born	39
Non-UK born	16
School leaver entrant	44
Graduate entrant	11

Medical school A	40
Medical school B	15

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

<i>Year of study</i>	<i>Number of participants</i>
1	7
2	14
3	13
4	11
5	10

Although a substantial number of health and personal problems affected the participants, these will be reported elsewhere (paper submitted for publication 2014). This study focused on the academic difficulties that these students encountered before or after failure.

Using a SRL perspective, we identified that medical students responded 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 strategies**

When describing their approach to learning in preparation for assessment, students cited using inappropriate strategies throughout the course. These included rote

memorising facts when deeper learning of concepts was more appropriate prior to short-answer question written assessments, or repeatedly practising '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)*

Interviewees had a tendency to describe focusing on 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)*

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 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)*

## **(2) Responding to failure: normalisation and external attribution**

### **Normalisation of failure**

Some students normalised their 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 unpleasant emotional experience of failing, it could result in trivialisation of failure and overlooking the need to seek help. Students worked to protect their identity and self-perceptions by playing down their failure.

*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)*

*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)*

Some of 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)*

### **External attribution**

Students tended 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 was a coping strategy that protected students’ self-esteem and well-being in the short-term but presented faculty with the larger problem of resistance to change. Students clung on to their existing learning strategies based on the fact that they were associated with success in the past supported by a belief that recent failures were 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 remedy their errors or if 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)*

The medical school was often cited as contributing to failure. 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 that they needed support in a timely manner, or for failing to provide all of the support needed.

*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) Failure to seek or access support, both 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)*

This 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 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)*

Efforts to protect their identity and well-being resulted in reluctance to learn by trying things differently and a desire to avoid the embarrassment of being seen to

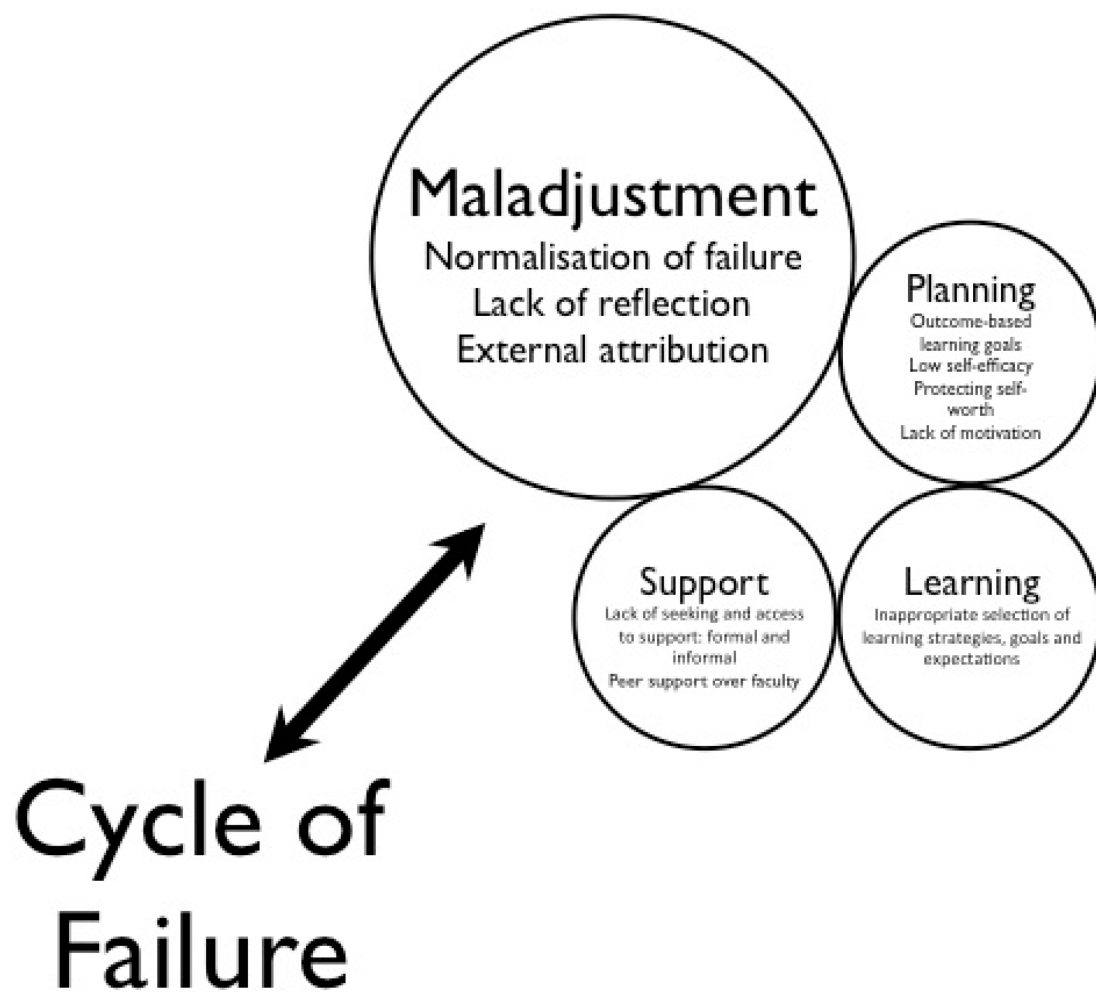
struggle. This was a barrier to gaining peer-support and learning from others.

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



**Figure 1 A model of poor utilisation of 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 that 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’ such as normalising failure or not seeking and accessing support.

There is also a relationship between academic performance and the causal attributions of learners, 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 associated not just with academic performance, but also potentially with 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. The exact reasons why students behave in this way remain unclear. However this study suggests that maladaptive SRL processes such as avoiding help-seeking, resisting changes to learning strategies and striving to just 'get the answer' may be responsible (31). The findings also suggest these processes 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 two-centre study included a large number of participants compared to other studies exploring the phenomenon of underperformance or failure at medical school (33-35). 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 contrasting programmes ensured that the findings were drawn from a sample that included the failing experiences of diverse medical students.

A retrospective study design was necessary since students could only be interviewed

after experiencing failure. The time period between failing and the interview was 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.

This study only included the perceptions of students who struggled with assessment at the end of the course, whereas the perceptions of others who struggled earlier may also be relevant when exploring the problem of underperformance throughout medical school. The perspectives of students who fail but pass the re-sits, and students who never underperform but only excel, could be used to compare and contrast the views presented by participants in this study. Furthermore, the perspectives of faculty could also be used to triangulate findings as well to explore the extent to which views between groups vary.

### **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 emotional 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 (36).

Students should be reminded about their responsibility to see help-seeking as

professional duty (37) 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 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 supportive, assessing and developing - conflict and compete with each other. Whilst medical schools must ensure they only graduate safe and competent doctors (37), they also have a duty of care to support students develop through the course of their education (37) 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, the medical school could focus more on the development role it 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 (38,39), since recognition is given to individuals who demonstrate effective self-regulatory behaviours and act as mentors or

'buddies' for students who fail (40,41).

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 (42), 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 with mentoring skills may be an effective methods for promoting SRL behaviours (43). This may also extend to developing peer-support systems or new proactive approaches to seek out those most in need of help. 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. JY facilitated the participation of Medical School B. 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 achievement 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) Cantillon P, Sargeant J. Giving feedback in clinical settings. *BMJ* 2008 Nov 10;337:a1961.
- (15) Daelmans HEM, Hoogenboom RJJ, 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.
- (16) 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.



- (17) Hays R. Remediation and re-assessment in undergraduate medical school examinations. *Med Teach* 2012 02/01; 2013/11;34(2):91-92.
- (18) 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.
- (19) Denzin NK, Lincoln YS. *Collecting and interpreting qualitative materials*. Thousand Oaks, CA: Sage Publications; 1998.
- (20) Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in Psychology* 2006;3(2):77-101.
- (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) Glaser BG, Strauss AL. *The Discovery of Grounded Theory. Strategies for Qualitative Research*. New Brunswick, USA: Aldine Transaction; 1967.
- (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) Edeiken BS. Remedial program for diagnostic radiology residents. *Invest Radiol* 1993 Mar;28(3):269-274.
- (34) Chou CL, Chang A, Hauer KE. Remediation workshop for medical students in patient?doctor interaction skills. *Med Educ* 2008;42(5):537-537.

- (35) Faustinella F, Orlando PR, Colletti LA, Juneja HS, Perkowski LC. Remediation strategies and students' clinical performance. *Med Teach* 2004 Nov;26(7):664-665.
- (36) Tough P. *How children succeed: Grit, curiosity, and the hidden power of character*. Boston, MA: Houghton Mifflin Harcourt; 2012.
- (37) The General Medical Council. *Tomorrows Doctors*. 2009.
- (38) Topping KJ. Trends in peer learning. *Educational Psychology* 2005 12;25(6):631-645.
- (39) 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.
- (40) Ashgar A. Reciprocal peer coaching as a formative strategy. *Assessment and Evaluation in Higher Education* 2010;35(4):403-417.
- (41) 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.
- (42) 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.
- (43) 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.