# Feeling our way: a framework for illuminating experiences of actuarial education

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**ABSTRACT**

This paper explores the possibility that there are actuarial students in South Africa who are harmed by aspects of the university and postgraduate actuarial education system on their path to becoming qualified actuaries. Our initiating research question is: How could we begin to understand the shared experiences of harm and healing in the actuarial study path? We locate the notions of harm and healing in the landscape of the high burden of personal and collective trauma in South Africa rooted in persistent inequality and systemic oppression. We put forward various forms of knowledge that have shaped our awareness of the possibilities for harm and opportunities for healing, and our starting assumptions for where some of these might be located. The paper presents an invitation to consider how a wise response to the South African trauma landscape can shape actuarial pedagogy. It further contextualises selected learning theories and pedagogical practices, rooted in the theory of constructivism, that can encourage healing in actuarial education. Finally, we introduce a research framework shaped by Nancy Kline's ten components of a thinking environment as a means to systematically address the research question. This framework outlines the use of the thinking environment to organise the research, to caringly identify experiences of harm and healing, and to consolidate findings in an emotionally responsible and trauma-informed way.

**KEYWORDS**
Generative education, actuarial education, trauma, inequality, South Africa, thinking environment, healing

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## 1. INTRODUCTION AND BACKGROUND

In South Africa, some students traverse the actuarial study path with significant harm incurred, where harm is understood as any action (intentional or not) that adversely affects wellbeing (WHO, 2009). We are particularly interested in the features of the actuarial study path that lie within the control of the profession – both as a curriculum setting and accrediting body, and actuarial educators – and hence provide opportunities for improvement.

The South African actuarial profession, which holds the potential to contribute to some of society's most pressing challenges, can only whole-heartedly achieve this if its members possess the resilience and wellbeing necessary to apply their skills boldly and courageously. This courage is necessary to critically engage with the curriculum (both formal and informal) and the assumptions underpinning the curriculum. The urgency of this capacity to respond to the needs of society in creative ways is increasing in the face of accelerating change, the rise of artificial intelligence and the risk of ecological collapse.

Building a psychologically safe education system that does not perpetuate systems of harm and separation, imbues a growth mindset and treats people in a way that enables them to think courageously for themselves, is what we will refer to as a "generative" education system. This terminology is adopted to reflect the continuous pursuit of generating the freshest, boldest thinking of its learners throughout the teaching and learning journey. A generative education system creates the conditions for healing to occur, by supporting connection and establishing safety (Porges, 2022). The word "healing" is used here to refer to an internal process of increased wellbeing. To build a generative actuarial education system, we must recognise the sources of harm, so that we can minimise the impact on wellbeing, and the sources of healing, so that we can leverage those opportunities for increased wellbeing.

This is the first paper within a larger body of work which ultimately will seek to answer the question of what a generative actuarial education system could look like. In this first paper we limit ourselves to an initiating question: How could we begin to understand the shared experiences of healing and harm in the actuarial study path?

In answering this formative research question, this paper covers:

- Potential sources of harm in the actuarial education system;
- A high-level understanding of trauma in the South African context and how trauma interfaces with the question of harm in the actuarial education system;
- Possible relationships that exist between decolonial approaches to education and trauma-informed approaches to education;
- An overview of educational approaches that move away from a deficit model that perpetuates exclusion and bias towards ones that are strengths-based, cultivates a growth mindset and ignites independent thinking;
- An overarching research framework that informs our conceptualisation of a generative actuarial education system, our conceptualisation of the research question and shapes all aspects of the proposed research methodology; and
- A proposed methodology for how research could be done with Actuarial Society of South African (ASSA) members to surface their experiences of where harm occurs in the actuarial education journey, considering curricula and environments, and where they feel collective healing and generation of independent thinking takes place.

It is expected that the following stakeholders will gain value from this body of work and the fresh thinking it could generate:

- All current and future ASSA members, including students who have experienced harm, can use this research as a source of encouragement to return to a feeling of wholeness, giving themselves permission to think and feel as their full selves;
- All actuarial academics and the ASSA education community who can contribute to a learning community and challenge the proposals that emerge, and thus help come up with robust solutions for holistic models of education that are sensitive to the trauma of the South African context.;
- ASSA transformation community, including the Transformation Committee, the Association of South African Black Actuarial Professionals (ASABA), the South African Actuarial Development Programme (SAADP), the ASSA Personal Development (APD) programme, and the Actuaries In the Making (AIM) vacation work programme;
- ASSA leadership and more broadly managers and leaders of actuarial professionals;
- Leadership and education communities of other South African professions; and
- Researchers and policymakers in the field of education.

## 2. SCOPE AND LIMITATIONS

As products of the current actuarial education system, there are of course ingrained biases, norms, prejudices and limiting assumptions that actuaries will naturally hold. The authors of this paper are not exceptions. The authors have studied what ignites independent human thinking and how to behave in ways that cultivate courage and psychological safety under

various pedagogical and coaching modalities. The knowledge gained from Time to Think training,[1] meditation practices in the Thai Forest tradition and the practice of breathwork,[2] guide our research philosophy and level of psychological, trauma and somatic (body) awareness. This means that our proposals are heavily influenced and biased towards these modalities.

Among the key issues facing actuarial education are the fact that there are too few black actuaries in South Africa and that the combination of a poor public education system, and a difficult study path exacerbates this problem (Naidoo, 2008; Strugnell & Ranchod, 2017). The demographic profile of the actuarial profession is inconsistent with that of South Africa. This also affects the supply of mentors for black and female students and the supply of lecturers, managers and supervisors who look like them. Since the Fellowship membership base of ASSA is 74% male and 76% white,[3] the profession is by default likely to be ignorant about many issues faced by black and female students. Any research therefore needs to be done with this context in mind. The research is further biased by the fact that both authors are of the same race group (Indian) and this presents a significant risk that the research framework proposed is blind to the lived experience of other race groups. The proposed research methodology aims to address this limitation by drawing on a diverse set of lived experiences – allowing for the authors' assumptions and expectations to be disrupted.

There are many actuarial students who may not associate their actuarial training with any psychological harm. There may be others for whom the harm has led to suppression of feelings as a coping mechanism. The research framework being put forward and its concomitant methodology is fundamentally one that draws on lived experience of past and current students. By definition, this paper, in proposing only the framework by which views can be sourced, precedes hearing from a wide range of voices, and so the study will need to evolve as it learns from experience. In this way, the research methodology itself should be generative.

The scope of the research framework proposed is focused on the South African actuarial education system, recognising that the structural inequalities in this environment mirror broader societal issues. While the emphasis is on the actuarial profession, the principles discussed are applicable to other South African professional education contexts.

The framework has the limitation of not offering prescriptive solutions to identified harms but rather provides a structure for exploring these places of harm and opportunities for healing. The framework also focuses primarily on the educational journey rather than the entirety of the professional experience. Finally, while drawing from established theories, this work should be seen as the beginning of a wider conversation rather than a conclusive way forward.

1 Time To Think. https://www.timetothink.com. Accessed 27 September 2024.
2 Breathwork Africa. https://www.breathworkafrica.co.za/. Accessed 27 September 2024.
3 Actuarial Society of South Africa. https://www.actuarialsociety.org.za/becoming-an-actuary-2/member-breakdown/. Accessed 27 September 2024

## 3. THE EMERGENCE OF THE RESEARCH QUESTION

The research question being put forward presupposes, to some extent, that there are points of harm in the current actuarial education system – and hence an opportunity to increase wellbeing and safety. As we engage in the proposed study, this presupposition may well be disrupted – a possibility that the researchers remain open to.

We put forward here the various forms of knowledge that have shaped our awareness of the possibilities for harm and opportunities for healing, and our starting assumptions for where some of these points of harm might be located. We mirror the proposed methodology by starting with lived experience.

Our most intimate knowledge of the actuarial education system has been from traversing the education system as students ourselves. These experiences are located in the past (between 20 and 30 years ago) and may well have shifted over time. The experiences of both authors as students are largely located at the same university which may not represent the experiences elsewhere. Nonetheless, we have identified some common features between our experiences. These can be summarised as:

— Experiences of shame: these took the form of a "stupid question" classroom culture and of students sometimes being publicly shamed in front of classmates. Practices such as publishing test results ranked by mark drew unsolicited attention to those struggling academically.
— Experiences of isolation and hyperindividualism: this was particularly prevalent in mathematical statistics subjects, where there was a sense that you need to struggle through problems on your own in order to attain mastery.
— Experiences of anonymity: remaining unknown and invisible to both lecturers and classmates.
— Experiences of scarcity and competition: a sense that a limited number of people would be successful and you needed to compete to ensure your own success (i.e. personal success is at the expense of others). Practices such as "look to your right, look to your left, only one of you will survive" are archetypal of this mindset.
— A classroom hierarchy with a strong power distance between lecturers and students, with emphasis on titles and protocol.
— Differentials in success based on race and gender. The further we go back in time, the less diverse and representative the classrooms were. We also experienced differentials in attrition rates, with our black and female classmates falling by the wayside.

The authors have also been actuarial educators at two universities and are able to draw on observations from those experiences. We have observed:

— A high incidence of mental health difficulty, including student suicide. We have found that the more we encouraged safe spaces, such as ASABA university chapters and psychological counselling offerings, the more we became aware of challenges experienced because of conversations that opened up.

— Distinct differences in classroom agency based on sociodemographic factors including culture, school background, home language, race and gender. In our experience, these dynamics can be changed through shifting how students occupy the physical space, inviting participation and encouraging small-group discussions.
— The uninviting nature of university physical spaces, including closed doors and communal spaces being safer for students whose race and/or sex match those of lecturing staff.
— Differential treatment of students in various institutional spaces – and how this impacts on a sense of safety and belonging.
— Differentials in the attrition rates of our students based on race and gender (Ramjee et al., 2013, Strugnell & Ranchod, 2017).
— A curriculum that does not critically engage the assumptions underpinning the capitalist economic model, nor the impact of late-stage capitalism on society. This is particularly troubling when students come from a lived experience of inequality.
— The curriculum does not openly and honestly engage with the history of the profession and the societal implications of that history – all the way from the role of Lloyds of London in the slave trade[4] to more contemporary issues of financial inclusion. The move away from mutuality and the role of indigenous African financial wellbeing practices are other examples of actuarial practice that are not critically evaluated in the curriculum.
— Actuarial students are trained to be thorough and precise. One can argue that actuarial training at university in its current form discourages experimentation and incorrect answers whilst heavily rewarding precision and accuracy (even when it is spurious).
— The absence of diverse role models as educators, as a consequence of the lack of diversity within the actuarial profession – and hence a mismatch between staff and student demographic profile, and more importantly, lived experience.

The authors have also experienced the impact of a number of interventions, ranging from informal shifts in classroom culture to structured programmes. These include the following examples:

— The South African Actuarial Development Programme (SAADP) and the Education Development Unit (EDU) (Pym, 2013) at the University of Cape Town has had positive impact on student success. These interventions combine the creation of a community, psycho-social support, academic support and financial support. There is also planned spaciousness in the curriculum. Importantly, the philosophical approach is one of leveraging student capabilities and disrupting the deficit model of education (Pym & Kapp, 2013; Strugnell & Ranchod, 2017).

4 *The Guardian*. https://www.theguardian.com/business/2023/nov/08/lloyds-of-london-accused-of-reparations-washing-over-response-to-slave-trade-review. Accessed 27 September 2024

— Programmes such as those run by the ASABA and AIM vacation work programme support student agency, relationship building, leadership development and build confidence through exposure (Hellig et al., 2022).
— The use of research papers on controversial topics like transformation and vaccination as teaching tools.
— The intentional use of diverse role models as guest speakers, mentors and collaborators, both inside and outside the classroom.
— Reducing anonymity, both when educators learn student names and stories, and when educators facilitate the conditions for connection between students.

## 4. LITERATURE REVIEW: TRAUMA

While all trauma involves harm, not all harm results in trauma, which the American Psychology Association defines as the emotional response to a terrible event.[5] Trauma is pervasive in South Africa, much of which is rooted in the personal and collective experiences of inequality, systemic racism and sexism. Many students carry the trauma of these systemic challenges, impacting their ability to thrive, innovate, and become independent thinkers. Experiences of harm are intimately connected to the high burden of trauma in South Africa. While we may recover relatively quickly from experiences of harm, the effects of trauma are lasting and they impact our perception of safety and hence our threshold for experiencing harm. The trauma experiences of being overwhelmed, and of not being able to return to homeostasis, impact our resilience in the face of harm (Porges, 2022). Experience of harm can perpetuate trauma, extending the long-lasting impact on physiology.

### 4.1 The neurobiology of trauma

In this paper trauma is understood as a neurobiological response: "trauma is not what happens to you but what happens inside you" (Maté & Maté, 2022). This internal impact is regulated by the autonomic nervous system and affects our entire system including neurotransmitters, hormones, and our immune and digestive function (Duncan et al., 2019). Perry & Winfrey (2021) explain that trauma gets stored in the lower parts of the brain (the limbic brain) and so the body's response to any external stimulus is first via the lower parts of the brain (see Figure 1). The limbic system, for example, will react emotionally to a stressor before we can "get to the cortex" to do our higher-order intelligent thinking – this helps us to understand the impact of safety on the creativity, imagination and problem-solving necessary for impactful actuarial practice.

Adverse experiences impact the "flexibility or resilience that an individual's autonomic state has in returning from a state of threat to a state that supports homeostasis" (Porges,

5 American Psychological Association. https://www.apa.org/topics/trauma. Accessed 27 September 2024.

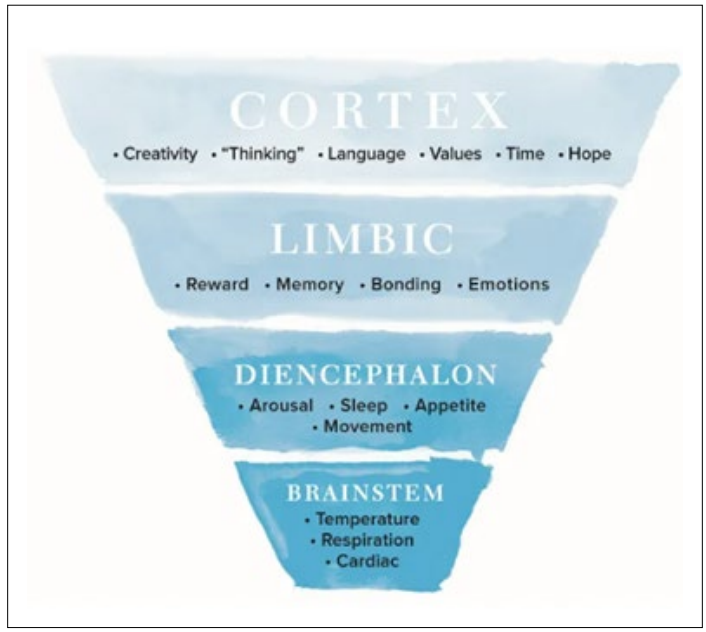


Figure 1. Hierarchical organisation of the brain (Perry & Winfrey, 2021)

2022). We can see how this loss of flexibility can be driven intergenerationally (Menakem, 2017), by early childhood experience (when most brain development occurs), by repeat or chronic experience and by the acuity of adversity experienced.

There is a powerful and increasing scientific evidence base for understanding trauma, and healing, from a somatic perspective (i.e. located in the body). This accords with the understanding from indigenous knowledge systems where the mind and body are understood to be intimately and bi-directionally connected (Levine, 1997; Maté & Maté, 2022; Menakem, 2017; Perry & Winfrey, 2021; Porges, 2022).

### 4.2 The South African trauma landscape

South Africa is understood as having an unusually high burden of trauma (Kaminer & Eagle, 2010; Ng et al., 2020; Williams et al., 2007). This is attributed to the history of colonisation, apartheid, state-sponsored oppression and rapid urbanisation, and the contemporary experiences of high levels of violence (interpersonal, criminal and gender-based), a high rate of road accidents and stark inequality. Close to three quarters of respondents to the South African Stress and Health (SASH) survey (2002–2004) reported lifetime exposure to at least one potentially traumatic event (PTE). Those who had had lifetime exposure, experienced an average of 4.3 PTEs. In other words, it is normal for South Africans to experience multiple PTEs across their lifetime (Atwoli et al., 2013).

A study of university students (McGowan & Kagee, 2013) indicated that this burden varies by race and gender. An understanding of the ways in which the burden of trauma

does not fall evenly, both intergenerationally and contemporaneously, and the existing evidence of differential success rates in actuarial exams along race and gender lines, amplifies the urgent need for a trauma-aware approach to actuarial education.

### 4.3 Decoloniality and trauma

The actuarial education system, like many educational structures, has been shaped by power dynamics that often marginalise under-represented groups. Systemic racism, sexism, and the legacy of colonial education systems create barriers to success for many students. This perpetuates a deficit model of education, where students who do not fit within certain norms are viewed as lacking, rather than recognising their strengths and potential (Pym & Kapp, 2013).

Decolonisation and trauma are deeply intertwined, particularly in societies like South Africa, where colonialism imposed lasting psychological and cultural harm. Colonial powers disrupted indigenous communities, marginalising their knowledge systems and subjecting them to "historical trauma," which is passed down through generations (Maté, 2011). Gabor Maté emphasises that trauma is not only an individual experience but a societal one, especially in contexts where entire communities face systemic violence and cultural erasure. Decoloniality, as outlined by Frantz Fanon, seeks to reverse this by challenging the intellectual and cultural dominance imposed by colonialism, which inflicted psychological harm by invalidating indigenous ways of knowing (Fanon, 1961).

The discourse on decolonising education has tended to focus on the content of curricula with insufficient attention paid to the need for healing (both individual and collective) and the dismantling of internalised oppression (both as oppressor and oppressed). The emergent field of decolonial healing is a more somatically-informed approach and operates more from the inside-out rather than from the outside-in.

This is not to say that there are not opportunities for reshaping the actuarial curriculum. Addressing the history of the profession openly, critically engaging with the assumptions underpinning the economic models that are taught, emphasising the use of actuarial tools in service of the public good (for example, constructing social solidarity) and introducing ethical and professional considerations earlier in the curriculum are all possible areas of intervention.

In South Africa, decoloniality is critical to addressing the trauma left by apartheid and racial capitalism, which perpetuated the colonial systems of inequality and exclusion. Educational systems rooted in colonial frameworks risk perpetuating these traumas – a very real threat for the actuarial profession. As argued by Le Grange (2016), decolonising education involves incorporating indigenous knowledge and validating the cultural identities and histories of students, helping to dismantle colonial legacies. Trauma-informed approaches, as proposed by scholars like Bessel van der Kolk and Bruce Perry, stress that healing from trauma requires reconnecting with cultural and historical roots to restore a sense of identity and self-worth (van der Kolk, 2014; Perry & Szalavitz, 2017).

A decolonial and trauma-informed actuarial education system is essential for South Africa's future, fostering both emotional healing and intellectual independence. By creating educational spaces that validate cultural identities and acknowledge historical trauma, students can begin to process the effects of colonialism and apartheid, ultimately empowering them to become resilient, independent thinkers.

### 4.4 Trauma-informed education

The pervasive trauma of the South African context must be acknowledged and appreciated for the sake of improving actuarial teaching. Because of relatively high failure and attrition rates, dealing with past personal trauma, trauma of South African life in general and the trauma induced by actuarial studies, trauma awareness is of critical importance. As Oprah said, "If we want to understand the oak, it's back to the acorn we must go" (Perry & Winfrey, 2021).

Due to the differences in lived experiences between actuarial educators and students, there is a risk of actuarial educators being under-attuned to the ways in which the curriculum, classroom culture and pedagogical approach may re-evoke past experiences of trauma or reduce overall levels of resilience.

Being as "trauma aware" as possible can equip educators with tools to help deal with the psycho-social elements many actuarial students face. This applies to being able to identify active trauma (and hence being attuned to when trauma is activated in the classroom), having the awareness of how to create an environment that feels safe, and having an awareness of how social connection supports the nervous system. It also means having the capacity to settle their own nervous system to enable co-regulation.

Facilitating breathing exercises, slowing things down during stressful times, offering words of encouragement before assessments, or short mindfulness exercises are examples of easily accessible tools available to educators. A trauma-informed teaching and learning approach is needed to make South African actuarial education more inclusive, accessible and robust as it prioritises understanding each student's unique background and experiences in shaping their learning journey (Carello & Butler, 2015; Walkley & Cox, 2013).

## 5. LITERATURE REVIEW: PEDAGOGICAL PRACTICE

Constructivism is a well-known theory of learning that emphasises that learning is an active, constructive process where students build new knowledge upon the foundation of previous experiences (Driscoll, 2005; Jonassen, 1999). Table 1, from the Teaching and Learning Resources wiki,[6] is a useful comparison of traditional and constructivist classrooms that we believe can benefit thinking in actuarial education.

6 Teaching and Learning Resources. http://teachinglearningresources.pbworks.com/w/page/19919544/Constructivism. Accessed 22 September 2024

Table 1. Constructivism

| Traditional Classroom | Constructivist Classroom |
|---|---|
| Curriculum begins with the parts of the whole. Emphasises basic skills. | Curriculum emphasises big concepts, beginning with the whole and expanding to include the parts. This is also sometimes described as an inverted curriculum. There is evidence that this approach is supportive in STEM fields for women and people of colour who are traditionally under-represented. |
| Strict adherence to fixed curriculum is highly valued. | Pursuit of student questions and interests is valued. |
| Materials are primarily textbooks and workbooks. | Materials include primary sources of material and manipulative materials. |
| Learning is based on repetition. | Learning is interactive, building on what the student already knows. |
| Teachers disseminate information to students. Students are recipients of knowledge. | Teachers have a dialogue with students, helping students construct their own knowledge. |
| Teacher's role is directive, rooted in authority. | Teacher's role is interactive, rooted in negotiation. |
| Assessment is through testing and correct answers. | Assessment includes student works, observations and points of view, as well as tests. Process is as important as product. |
| Knowledge is seen as inert. | Knowledge is seen as dynamic, ever-changing with our experiences. |
| Students work primarily alone. | Students work primarily in groups. |

We present evidence of the benefits of the following principles, philosophical choices and pedagogical practices for actuarial education, with a central focus on constructivism:

(1) Cultivating a growth mindset encourages students to embrace the idea that their abilities can expand with effort and perseverance, aligning with the constructivist belief that learning is a continuous process of growth (Boaler, 2016; Dweck, 2006);
(2) Experiential learning leads to more effective learning than traditional academic activity that is confined to a classroom (Beard & Wilson, 2013; Kolb, 1984);
(3) Metacognition, which is thinking about one's thinking, and emotional awareness creates ability to close skills gaps efficiently (Flavell, 1979; Schraw & Moshman, 1995; Duncan et al., 2019);
(4) Learning to celebrate failure is key to mastering actuarial techniques as it fosters resilience and the understanding that errors are opportunities for growth and deeper learning (Kapur, 2008; Edmondson, 2011; Naidoo, 2008); and
(5) A focus on recognising and leveraging the diverse strengths present in the classroom fosters independent thinking.

We discuss in section 6, how all the pedagogical models referenced here are drawn together in the creation of thinking environments defined by Kline (1999).

### 5.1 Cultivating a growth mindset

A growth mindset is the belief that one can grow into one's ability and that intelligence is not fixed. It is the opposite of believing that one's abilities are already innate and cannot be changed. For example, "I'm bad at maths" would be a manifestation of a fixed mindset. Evidence shows that when students are taught that they can grow into their abilities, this

drastically improves their academic performance. There is even evidence that shows that cultivating growth mindsets can temper the effects of poverty, a finding that is extremely important in the South African context. (Claro et al., 2016, Yeager et al., 2019)

Experiences of trauma act to reduce growth mindset – and supporting a growth mindset could mitigate the impact of trauma on educational outcomes (Lurie et al, 2023). Teaching the implications of a growth mindset is thus important, especially for black and female learners. A growth mindset is also easier to access when one has role models, and stereotypes act in your favour. Students are more likely to achieve when their profiles match those of their teachers (Claro et al., 2016; Naidoo, 2008). These factors make the actuarial profession's transformation objectives all the more difficult to achieve (the distorted demographic profile of the Fellowship member base of ASSA was described in Section 2). The lack of role models and mentors for black and women students in the actuarial profession and the structural barriers faced by these groups limit their exam progression (Naidoo, 2008; Strugnell & Ranchod, 2017).

### 5.2 Experiential learning

Experiential learning is a key element of constructivism (Driscoll, 2005; Jonassen, 1999). The benefits of experiential learning, or learning by doing, and play in education are widely accepted (Beard & Wilson, 2013; Kolb, 1984). By engaging with real-world scenarios, students actively construct their understanding of complex concepts. Moreover, by incorporating play into education, students build more social skills and become more adaptable and resilient (Brown & Vaughan, 2009).

In particular, for actuarial education, the value of experiential learning is well known (Lowther et al., 2009; Hellig et al., 2022). The Actuaries In the Making (AIM) virtual vacation work programme is an example of an experiential learning intervention described by Hellig et al. (2022) that has grown significantly[7] due to the educational value added to education of students and practising actuaries alike.

### 5.3 Emotional and social competence

"Emotional competence requires the capacity to feel our emotions, so that we are aware when we are experiencing stress; the ability to express our emotions effectively and thereby to assert our needs and to maintain the integrity of our emotional boundaries; the facility to distinguish between psychological reactions that are pertinent to the present situation and those that represent residue from the past" (Maté, 2011).

The idea that being aware of where one's skills gaps are and the awareness that one can grow into these skills are powerful accelerators of learning (Claro et al., 2016; Flavell,

7 In a LinkedIn post by Actuaries In the Making (AIM) virtual vacation work programme (see https://www.linkedin.com/feed/update/urn:li:activity:7216392540453806080), the organisation confirmed that over 300 students have been put through the streamlined virtual vacation work programme in its first six iterations of the programme spanning a period of three years.

1979, Dunning et al., 2003; Fleming, 2014; Yeager et al., 2019). Analogously, making students aware of their feelings and noticing dysregulation in their bodies has wellbeing benefits (Duncan et al., 2019). As Brene Brown says: "curiosity is recognising a gap in our knowledge about something that interests us, and becoming emotionally and cognitively invested in closing that gap through exploration and learning" (Brown, 2021).

An important way to work through difficult feelings is thus to create ease and order in the following sequence, consistent with that proposed in Perry's Neurosequential Model[8] (Perry & Szalavitz, 2017):

— **Regulate the body** This involves getting one's breathing to an easeful rhythm and may entail things like taking deep breaths, focussing on the action of breathing itself, calming rhythmic movements, slowing down, making a connection to the body, orienting to one's surroundings and finding a place of ease in the body (Levine, 1997). Co-regulation is a powerful mechanism (Porges, 2022).

— **Relate to the feelings** Once the body is regulated, it is useful to support introception (awareness of feelings and what is happening in the body) (Duncan et al., 2019) and potentially helpful to validate the feelings of the thinker (the student in our case); for example, relating to feelings could mean saying things like "I know this is distressing and it is ok to feel angry or scared".

— **Reason using logic** Only once regulation and relation have been achieved, will supplying the logical reasoning and facts be effective in the context of a traumatic response.

— **Restore** "When we are distressed or dysregulated we can say or do things that cause harm. When this happens it's necessary to try to repair or restore the situation or relationship in order to return to normality and get on with learning".[9]

It is important to understand human beings as social mammals and in the context of trauma, sociality as a neuromodulator (Porges, 2022). Naidoo (2008) argues for the importance of social-competence skills as a factor affecting the completion of an actuarial qualification. This supports and informs the focus on teaching students how to create environments that help independent thinking and cultivate a growth mindset. First-generation students also struggle to fit in socially, often entering environments that are unwelcoming or hostile, and Naidoo (2008) argues that social activity is an important component of an environment that helps a student thrive. This emphasises the importance of the social events run by organisations such as ASABA university chapters and other such transformation initiatives.

8 Dr Bruce Perry's sequence of engagement is explained very well in the YouTube video 4. Regulate, Relate, Reason (Sequence of Engagement): Neurosequential Network Stress & Trauma Series; Accessed 25 September 2024.

9 https://education.gov.scot/media/4a3dm1un/regulate-relate-reason-restore-information-note-informed-level.pdf

### 5.4 Celebrating failure

Actuarial education often prioritises precision, discouraging experimentation and rewarding accuracy, even when spurious. However, to foster learning from failure, a systemic shift is necessary. Benjamin Zander, conductor of the Boston Philharmonic and author on leadership, advocates for reframing mistakes as opportunities for growth. His method, described in *The Art of Possibility*, involves encouraging students to physically and mentally embrace errors by throwing their arms up and exclaiming "How fascinating!" (Zander & Zander, 2002). This deliberate shift in posture and expression not only reframes the cognitive response to failure but also alters the body's physiological response, reducing fear and tension.

By adopting a celebratory reaction to mistakes, students retrain their bodies to associate failure with curiosity and learning, rather than self-criticism and anxiety. This approach aligns with educational theories suggesting that failure is essential for deeper learning (Kapur, 2008), and evidence shows that cultivating such a mindset enhances creativity and resilience (Zander & Zander, 2002).

In actuarial studies, embracing failure through these techniques could help students navigate the increasing complexity of their exams by focusing on learning and progress rather than an unrealistic pursuit of perfection. It would also support actuaries being able to work in learning teams or organisations: not the ones that make the least mistakes, but the ones that were willing to talk about their mistakes and failures (Edmondson, 2011).

### 5.5 Strengths-based pedagogy

An educational approach that moves away from a deficit model that perpetuates exclusion and bias could be one that is strengths-based, cultivates a growth mindset and ignites independent thinking. A simple example of this is framing a student from a poor home and rural school as being disadvantaged – or recognising the extent of the perseverance and raw talent required for such a student to have been accepted into an actuarial programme. (Pym & Kapp, 2013).

Decolonising education is another route towards celebration of multiple intelligences and capacities, including indigenous knowledge. An opportunity exists to explore what relationships exist between decolonial approaches to education and trauma-informed approaches to education.

## 6. THE THINKING ENVIRONMENT AS A FRAMEWORK FOR IDENTIFYING HARM AND HEALING

To build a generative and healing actuarial education system, we must recognise both the sources of harm and the areas of healing that foster growth. The theory of thinking environments developed by Nancy Kline offers a valid approach to explore both these angles since the body of work on creating thinking environments involves a consideration of what helps and hinders independent thinking. In particular, studying thinking environments

demands introspection into what erodes ease and trust within relationships and involves systematic examination of the underlying assumptions that each thinker in the system holds.

A thinking environment is a way of behaving that is informed by the finding that how we treat people has a direct influence on how well they can think for themselves. The ten ways of behaving such that a thinking environment is created, so that a person's independent thinking is ignited, are referred to as the ten components of a Thinking Environment™ (Kline, 1999, 2020). Creating thinking environments has been shown to transform business meetings into places of growth, creativity, and robust thinking (Havers, 2008) and has the power to strengthen the quality of teaching and learning in the classroom. The ten components of a thinking environment, that have consistently yielded good results in generating independent thinking, are summarised below:

— Giving attention by listening with palpable respect and without interruption, with deep interest on where the thinker will go next and with a willingness to be changed by what emerges;
— Creating equality by treating each other as thinking peers, giving equal turns to think and speak, and keeping agreements and boundaries;
— Showing appreciation by noticing what is good and saying it, offering genuine acknowledgement of a person's qualities in a sincere, specific and succinct way and practising a 5:1 ratio of appreciation to criticism;
— Creating a sense of ease by offering freedom from internal rush or urgency;
— Offering encouragement, giving courage to go the cutting edge of ideas by moving beyond internal competition between you and the thinker;
— Welcoming feelings by allowing sufficient emotional release to restore thinking;
— Giving information by supplying the necessary facts as well as dismantling any denial that may exist;
— Embracing difference by committing to freedom from untrue assumptions driving prejudice, welcoming divergent thinking and diverse group identities;
— Asking incisive questions, which are questions that challenge and remove assumptions that limit our ability to think for ourselves and replace such assumptions with true and liberating ones; and
— Creating the right place, a physical (and possibly virtual) environment that says to others that they matter – when the physical environment affirms our importance, we think more clearly and boldly.

We posit that an actuarial education system designed as a thinking environment fosters conditions that promote independent thinking, empathy, and equity. Such an approach not only equips future actuaries with the technical competencies required for their profession but also enhances their capacity for critical and creative problem-solving, particularly in addressing complex societal challenges. A research framework that is grounded in the

principles of thinking environments serves as an intersection between pedagogical theory and trauma-informed practice, offering a holistic framework that gives attention to both cognitive development and emotional resilience in learners.

Using the ten components of a thinking environment provides a robust framework for exploring both the harm and healing within the actuarial education system. In the table below, we locate our lived experience (section 3) within this framework.

Table 2. Our lived experience located within the framework

| Ten components | Harm | Healing |
|---|---|---|
| Attention | Experiences on anonymity | Some actuarial programmes are characterised by the existence of good relationships between staff and students.<br><br>The introduction of listening skills into the Fellowship professionalism course. |
| Equality | The curriculum currently does not explicitly acknowledge the relationship between the sites of actuarial work and the lived experiences students have of inequality.<br><br>The university environment is characterised by hierarchy – this can be seen in the attachment to the use of titles.<br><br>This is also reflected in the absence of a transdisciplinary orientation and a sense of actuarial superiority over other disciplines (including how actuarial work is valued and remunerated relative to other expertise). | The work done by AIM to level the playing field in terms of access to virtual vacation work opportunities (experiential learning) for students and in-person networking and relationship building. |
| Appreciation | A hyperfocus on correction and precision. This creates an orientation to obsessing about points of failure, and little celebration of student strengths and increased capacities because of overall learning. | The AIM programme has built appreciation systematically into the programme. In the closing ceremony, for example, there is a process of appreciation for colleagues and business owners.<br><br>The ASABA excellence awards celebrate impactful community engagement. |
| Ease | The mainstream curriculum is very full – making a sense of ease difficult to maintain. | Planned spaciousness in the EDU curriculum.<br><br>Incorporation of teaching the thinking environment as part of the actuarial curriculum in at least one university |

| | | |
|---|---|---|
| Feelings | The actuarial discipline has a cognitive emphasis, arguably at the expense of felt thinking and awareness of feelings. The suppression of feeling comes through in high rates of mental health difficulty and suicide. | At the actuarial convention in recent years there has been an increasing role modelling of vulnerability – there is an opportunity for this to be fed back into the education system.<br><br>Introduction of Time to Think methodologies at some universities encourages articulation of feelings. |
| Information | An absence of information about the lived experience of South Africans, for example, the cultural funeral practices that underpin funeral policies.<br><br>A denial of the dissonance experienced by students in their lived experiences of inequality. | Encouragement of research around transformation by ASSA. |
| Difference | The lack of difference is reflected in the demographics of teaching staff, the absence of role models in the classroom and the differential attrition rates along race and gender lines.<br><br>Unequal access to interventions across universities (e.g. SAADP, ASABA). | The ASABA leadership development programme for female actuarial candidates.<br><br>The explicit equity mandate of SAADP. |
| Incisive questions | Reflected in the lack of critical engagement with the actuarial curriculum, and an unquestioning acceptance of the assumptions underpinning the dominant economic model (e.g. unchallenged limiting assumptions around late-stage capitalism and prolonged exclusion of vulnerable communities from parts of the financial system) | Research plays an important role in disrupting assumptions. There is an opportunity to strengthen the feedback loop between the convention and the classroom. As an example, the use of research papers as a learning tool at some universities encourages critical thinking. Students are encouraged to craft their own incisive questions that are ignited by reading the research papers. |
| Place | University spaces tend to be uninviting – closed doors and concrete. | Meal assistance programmes at some universities are highly utilised, offering a supportive and wholesome environment. |

Each component fosters the kind of environment where independent thought, critical self-examination, and emotional resilience can thrive. For instance, attention, characterised by focused, respectful and interested listening, can empower students by validating their thinking (Kline, 1999). It offers a space for students to explore ideas without the fear of being interrupted, creating a foundation for intellectual freedom. Similarly, equality in the classroom encourages equal participation, which can prevent dominant voices from overshadowing quieter individuals, fostering inclusivity (Kline, 1999) – an experience that is particularly poignant in South Africa, where inequality is systemic and pervasive.

Appreciation, practised regularly, makes students feel seen in a context where they may not always have been seen or acknowledged. It strengthens students' confidence, making them feel valued, which can offset feelings of alienation common in competitive fields like actuarial science (Kline, 1999). Moreover, by encouraging ease and reducing pressure,

lecturers can create a conducive learning atmosphere that promotes better thinking and emotional wellbeing. Encouragement, by eliminating internal competition, allows students to take risks without the fear of judgement, facilitating creative and critical thought (Kline, 1999).

The remaining components, such as incisive questioning and welcoming difference, push students to confront limiting assumptions and embrace diverse perspectives, while place and feelings contribute to an environment that supports emotional expression and safety, both crucial for healing from trauma (Kline, 1999). This holistic approach not only helps identify where harm occurs in the education system but also illuminates spaces of growth and healing, making the thinking environment a valuable lens for research in actuarial education.

Finally, it can be argued that a thinking environment helps address relationship poverty (i.e. an absence of connection and trust) that perpetuates trauma (Perry & Szalavitz, 2017). It follows that solving ASSA's transformation challenge requires a focus on increasing the quality of relationship building students undertake with peers, mentors and collaborators within the actuarial profession. This in turn can enhance a student's propensity to think independently, which increases self-confidence and belief in the unique value they can add as actuarial practitioners. This furthers creation of ease in the conversations they have (including asking for help), ultimately multiplying the types of work opportunities they open up for themselves, and improving the (formal and informal) mentorship and coaching they seek to further facilitate their independent thinking and progression with exams.

## 7. AN EMERGING RESEARCH METHODOLOGY

The goal of this paper is to prototype a research methodology that aims to study the places of harm and healing in the education of actuarial professionals.

We propose facilitating a series of Conversation Cafes to lift out the emerging themes in relation to experiences of the actuarial education system. Conversation Cafes are facilitated focus groups, oriented to collective thinking, in which the right to speak rotates and every participant has a say. The Cafes would be carefully designed to be a Thinking Environment as defined by Kline (1999).

Study participants will be those who have completed an undergraduate degree in actuarial science and who continue to be affiliated with the actuarial study, either with intention to continue the qualification or who are already qualified. The Cafes will be designed to surface their sense of where harm occurs in the actuarial education journey, considering curricula and environments, and where they feel collective healing and generation of independent thinking takes place.

We recognise that there is a survivorship bias present in this sample and that this sample is likely to understate the extent of harm experienced in the process. A focus on those who have "survived" serves the following functions:

— It addresses the question of whether survival is an adequate measure of success of actuarial education programmes.
— Highlighting the areas of harm experienced even by those who have continued on the path provides an entry point to begin to address the most pressing issues that emerge.

The number of Cafes will be budget dependent, with an intention to ensure diverse participation along the following dimensions:
— gender;
— race;
— home language;
— time since graduation;
— exam progression; and
— university of study.

Our proposed sampling methodology is snowball sampling, with participants opting in. A snowball methodology will facilitate trust and familiarity with the research process. We will be deliberately ensuring that the sample is not representative of the current demographics of the actuarial profession's membership, given that the membership itself is not representative of South Africa more broadly. We will prioritise diversity of participation to ensure that attention is paid to voices that are typically not heard. This maps onto the "difference" and "equality" aspects of the framework. Focus groups will be limited to a maximum of five participants, creating the safety and space needed for exploration of feelings (Kline, 1999). We remain open to smaller focus group sizes and individual interviews should the findings show that deeper exploration or greater confidentiality is required in the conversation.

These will only be lightly structured (to allow for themes that haven't been anticipated to be revealed). They will leverage key methodological principles from Most Significant Change (MSC) methodology – a qualitative methodology for surfacing the multiple and cumulative changes that emerge in the course of complex change initiatives involving diverse actors. MSC is a narrative-based approach to capturing change through the stories and assessments of those deeply involved and affected by change initiatives.

### 7.1. Analysis in the form of a healing feedback loop

The question of whether research of this nature can be healing in and of itself is central to the approach being proposed. The word healing is used here to refer to an internal process, that is not something that is done by one person to another, but rather a metabolism of one's own somatic experience that occurs. Using the creation of a thinking environment as a framework, we propose a research methodology that brings together the ten components of a thinking environment and principles of trauma awareness.

This orientation to healing is embedded into the research by:

(1) paying attention to lived experience,
(2) doing the research in groups to enable social connection,
(3) not perpetuating patterns of extraction by treating research participants just as sources of data,
(4) facilitating the groups in a trauma-aware and somatically-informed manner, and
(5) utilising the proposed framework to ensure psychological safety.

The proposed ethnographic approach, where cultural informants use their own words and expressions, exists in counterpoint to the dominant actuarial approach which is quantitative in nature. We can only think for ourselves when we can think as ourselves, and this includes language. The qualitative approach we have suggested aligns with the "attention" component of the framework by beginning by listening deeply and respectfully to the lived experiences of members of the profession.

We know from the literature on trauma that social connection and safe community are key conditions for healing to occur. Doing the research in groups and not primarily through one-on-one interviews allows for witnessing of experience to occur and for the possibility of taking comfort in shared experience.

The proposed immersion allows for deep contextual co-creation of knowledge. We have considered the ways in which the research process would be beneficial for both participants and researchers. At a minimum, the opportunity to shape actuarial education for future generations is one we believe will create meaning.

Both authors will be the researchers and have training in methodologies for creating safety. We are also working in a trans-disciplinary manner drawing on support from those trained in somatic experiencing (Levine, 1997) to ensure that the design of Conversation Cafes upholds the highest standards of trauma sensitivity.

Key features include:

— Inviting participants to locate a place of safety within their own bodies that they can return their attention to;
— Giving explicit permission for people to be able to leave the room and ensuring that people are aware of the exits;
— Not requiring people to close their eyes at any point;
— Allowing for people to stand if they wish to do so;
— Using the breath to settle nervous systems;
— Being aware of when there is a need to discharge energy in the room (through active breathwork exercises and movement); and
— Providing information and referral pathways to professional psychological intervention with licensed therapists should a participant or researcher identify the need for counselling.

The use of the framework is outlined in the next section.

### 7.2 Qualitative research in a thinking environment

Table 3 outlines how we intend to conduct the Conversation Cafes in line with the proposed framework.

Table 3. Research design using the framework

| **Ten Components** | |
|---|---|
| Attention | Information will be shared on how to offer attention to each other and to listen respectfully and in such a way that generates thinking.<br>Participants will be given an opportunity to respond to questions using the Round building block of a thinking environment (Kline, 1999) at the start of the meeting and intermittently. This provides equality of airtime, ensures that participants are not interrupted and provides the psychological safety of being able to anticipate when you will have an opportunity to speak. Participants can "pass" if they are not ready, ensuring they are never under pressure to respond if they're not ready to. They will be given another opportunity once the round is complete.<br>Everyone else in the room will be encouraged to listen with interest – this means removing digital interruptions and being clear about the expectations of participants. All participants will be required to make a promise of no interruption, proven to expand intelligence and propensity for feelings (Kline, 2020). |
| Equality | The Round structure, with boundaries in terms of order and frequency of each participant's contribution, supports the creation of equality by treating each other as thinking peers. In particular, giving equal and uninterrupted turns to think and speak, and keeping agreements and boundaries are techniques that the facilitators are formally skilled in. |
| Ease | The Cafes will be scheduled with sufficient time to ensure that there isn't a sense of urgency. It is key that people have time to tell their stories, and that there is time available for pausing, and for processing.<br>Ease is also supported in the spaciousness of the design of the cafe, starting by building connection and having a spacious agenda that allows for breaks that allow regulation and grounding through movement and brief disengagement.<br>Tools such as explicitly agreeing how participants will signal when they are done with a particular wave of thinking during certain facilitated exercises, will be used. As a general principle, silence will not be regarded as confirmation that a participant has completed a thinking cycle; instead silence will be respected as fertile ground in which new ideas are being born.<br>Ease is supported by the facilitators being able to settle their own nervous systems. It is also supported by starting the Cafes with breathwork exercises designed for nervous system regulation. |
| Appreciation | Appreciation will be infused all the way from the invitation, to how people are welcomed into the space, and the signals that they are valued and their presence is appreciated.<br>The Cafes will be designed with space for an appreciation practice at the end. Throughout the conversation, appreciation will be expressed in the form of attentive listening that conveys the belief the researchers have in participants' capacity to think for themselves. There will also be implicit and explicit stating of assumptions that are true and liberating for participants. |
| Encouragement | The facilitators will provide encouragement by role modelling vulnerability and by inviting candid sharing from participants. They will make the promise of no interruption and will explicitly state that they choose not to compete with the thinker or inject their own thoughts into the thinker's process but will instead choose to give the thinker courage to fully explore their thoughts and feelings about each question. |

| | |
|---|---|
| Feelings | Question design will include questions designed to welcome feelings. Being present to feelings as they arise will be supported through creating the necessary spaces and pauses, through establishing a sense of social connection, and through providing somatic support. |
| Information | We will share information on how to establish a sense of embodied safety.<br>We will share information on the research design, on confidentiality and on how the insights from the Cafe will be analysed and used, on the structure of the Café and when planned pauses and breaks are scheduled for if there are any.<br>We could consider sending questions in advance so people know what will be required of them.<br>Opportunities will also be presented to confront any form of denial – about the intention or scope of the research or any other aspect of reality – that enters the conversation. |
| Difference | There are multiple dimensions of difference considered in the sampling methodology. It may be necessary, given the race dynamics in South Africa and within the profession, to consider affinity groups to support a sense of safety. If we were to do this, we would still ensure diversity within groups along other dimensions.<br>Participants will also be encouraged to tell divergent stories. Acknowledgement of group identities and welcoming expression of prejudices faced because of such identities will be invited.<br>We will also continue to check any assumptions that may surface that may drive prejudice about any part of the process. |
| Incisive questions | Attention will be given to the creation of true and liberating assumptions by the researchers as well as allowing the study participants to formulate their own liberating alternatives to assumptions that limit their thinking.<br>True and liberating assumptions will be conveyed explicitly (e.g. through verbal statements) as well as implicitly (e.g. in listening with deep respect and by making the promise of no interruption we will be inviting consideration of the assumption that the participant's thoughts are uniquely valuable and valuably unique and worthy of attention) (Kline, 2020). |
| Place | The Cafes will be held in person. We will ensure that we use venues that have a warm atmosphere and that seats can be arranged in a circular manner, reinforcing equality, ease of eye contact facilitated by geometry and safety through freedom of movement. We will ensure that digital devices are out of sight and switched off to convey the utmost level of respect for each thinker. Having easy access to an exit is important as is having a good balance between a sense of personal space and a sense of intimacy. Appropriate refreshments will be made available, and breaks **will be** built into the agenda to facilitate internal physical comfort. |

### 7.3. Question design

We propose using the ten components as a framework to guide the design of questions for research participants to identify both the places of harm in the actuarial education journey, as well as opportunities for creating generative conditions. The component of incisive questions has been used to design prompt questions for participants even though not all of these questions meet the formal definition of Incisive Questions in the thinking environment framework. These questions are designed to be as open-ended and invitational as possible to avoid injecting our own thinking into a thinker's expression and will be refined throughout the research process. A possible initial set of questions is proposed in Table 4. The list of questions and the questions themselves will need to be shortened for maximising their propensity to ignite thinking and to create more freedom. We hope that the discussion of this paper at the convention, along with the informal conversations that follow, will help us refine the questions we plan to use in our research interviews.

Table 4. Question design using the framework

| Components of a thinking environment | Identifying harm | Identifying generative opportunities |
|---|---|---|
| Attention | — How would you describe the quality of attentive listening that you received from your peers/lecturers throughout your study journey? | |
| | — What might you have assumed about the quality of attention given, that stopped you from freely expressing yourself to your peers and lecturers?<br>— In your experience, who did not listen to you with respect? How did you experience the impact of that? | — Who in your actuarial education journey made you feel that your thoughts were valued and listened to you without interruption and with respect?<br>— How did they do that? |
| Equality | — How did you feel about your capacity to brilliantly think for yourself compared to that of your peers and your lecturers? What are things that reinforced these feelings of competence/incompetence?<br>— When did you experience that you mattered as equally as everyone else in the classroom? What do you think made this possible? | |
| | — What might you have assumed about the level of equality in the classroom that stopped you from fully expressing yourself to your fellow students and lecturers? | — Who in your actuarial education journey made you feel that you had equal capacity to think for yourself as your peers and lecturers did?<br>— What events or activities reinforced these feelings? |
| Ease | — How would you describe your feeling of ease, if any, during your actuarial studies? | |
| | — Who made you feel a sense of urgency instead of ease during your actuarial studies?<br>— What might you have assumed that stopped you from creating a sense of ease for yourself during your actuarial studies? | — Who made you feel at ease during your actuarial studies?<br>— What events or activities created a sense of ease in your studies? |
| Appreciation | — Did you experience genuine praise and acknowledgement in the actuarial learning environment? If so, how was it offered?<br>— Who did you express appreciation to during your actuarial studies? And when? | |
| | — What might you have assumed that stopped you from appreciating others during your studies?<br>— What might you have assumed that stopped you from asking for appreciation when you felt you needed or deserved it? | — Who made you feel appreciated?<br>— What if anything made you feel appreciated during your years of study? |
| Encouragement | — How did you experience a sense of encouragement, if any, from your lecturers? And peers?<br>— What do you think contributed to this?<br>— How did you experience covert competition, if at all, with your peers? | |
| | — Who was more interested in competing with you than giving you the courage to explore the full extent of your thinking? | — Who gave you courage to go the cutting edge of your thinking? |
| | — What behaviours of your fellow students or lecturers made you feel they were more interested in competing with than encouraging you to stretch and grow your thinking? | — What behaviours of your fellow students or lecturers made you feel they were more interested in encouraging you to stretch and grow your thinking than competing with you? |

| | | |
|---|---|---|
| Feelings | — Were your feelings welcomed and invited in your places of study? How so? | |
| | — Where did you feel you had to suppress your feelings?<br>— Who made you feel that they were not interested in how you felt? | — Where did you feel free and welcome to say how you were feeling?<br>— Who invited you to say what you are feeling? |
| Information | — Were you supplied all relevant facts you needed to think for yourself during your studies or was important information withheld from you? What more do you think or feel or want to say about the information provided to you? | |
| | — What information do you feel was missing or withheld during your studies that could have better allowed you to think for yourself? | — In what environments did you feel you were given the right information you needed to think for yourself? |
| Difference | — Were differences of opinion welcomed or avoided in your learning environment? How so? | |
| | — Were certain group identities more welcomed than others in your place of learning?<br>— Which of your group identities did you feel were not welcomed in your place of learning? Who/ what made you feel that way? | — Which of your group identities did you feel were fully embraced in your place of learning? Who/ what made you feel that way?<br>— When did you experience the freedom to be fully yourself? What made it so? |
| Incisive questions | — What do you know now that you wish you knew when you were a student that would have helped you think for yourself? What were the assumptions you made when you were a student? | |
| | — What might you have assumed that limited your ability to think for yourself during your studies? | — Looking back, what were you assuming that gave you the will and courage to succeed? |
| Place | — Were there times where you were physically not well due to not having sufficient nutrition? What do you recall about those times and what did you do?<br>— Were there times you were hungry without means to obtain food during your studies? What do you recall about those times and what did you do?<br>— How did the physical learning environment make you feel about whether or not you mattered? | |
| | — What physical environments made you feel insignificant or worthless or that you did not matter? | — What physical environments made you feel valued and that you mattered profoundly? |

## 8. CONCLUSIONS AND AREAS FOR FURTHER RESEARCH

The research framework proposed systematically allows for the exploration of feelings and experiences that help us answer the research question: How could we begin to understand the shared experiences of harm and healing in the actuarial study path? It outlines the use of the thinking environment to organise the research, to caringly enquire about experiences of harm and healing, and to consolidate findings in an emotionally responsible and trauma-informed way.

While we have drawn on our own lived experiences (as students and then as educators and researchers) to illustrate how harm and healing map onto the ten components of the thinking environment, the research methodology has been designed to challenge our own assumptions and biases, reflecting a commitment to being willing to be changed by what we hear.

Based on the findings of such research, it may be useful to identify potential opportunities

to dismantle systems that cause harm to students, and hence potentially evoke, amplify or perpetuate the impact of trauma. This may reveal further opportunities to instil a sense of pride and dignity in the unique lived experiences of people and in indigenous cultures and knowledge systems. In this way, the framework is an enabler for a broader body of work that can achieve the following:

— Formulate potential guiding principles for what good actuarial thinking feels like, through initial hypotheses, gathering of ideas from the actuarial community and the challenging of assumptions we make that limit our thinking, and therefore our impact; and
— Discover new pedagogical practices drawing on the findings of the research – including igniting fresh actuarial thinking on accreditation, educator training, optimal classroom culture, curriculum design, and assessment – that increases capacity for independent thinking while nurturing the possibilities of collective healing, co-creation and co-liberation in the profession.

Such work can be done effectively through continuing to adopt a trans-disciplinary and ethnographic approach, that includes drawing on the expertise of educationalists, breathwork practitioners, trauma-informed practitioners, and the fields of meditation and somatic experiencing.

This could lead to the study of optimal ways to facilitate individual and collective healing from the ubiquitous trauma of the South African context so that many actuarial students can better traverse the financial system and profession that has been historically oppressive to their people. Such a pursuit could translate to

(1) alternative ways to think about actuarial pedagogy, especially by appreciating the interaction between healing from trauma, holistic financial wellbeing and altruistic actuarial principles such as pooling of risks and solidarity; and

(2) exploration of assumptions in actuarial work linked to late-stage capitalism that may limit the impact of the actuarial profession and that probably need to be challenged.

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