Shaping Preservice Teacher Identity in South Africa: The Impact of a Brief Growth Mindset and Emotional Intelligence Intervention

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Abstract. This study employed a quasi-experimental, mixed methods design to evaluate the impact of a brief intervention grounded in growth mindset and emotional intelligence. This study included an intervention group (*n*=86) and a comparison group (*n*=82). Self-report questionnaires were used to measure the intervention group across four time points (4 weeks before the intervention started, immediately before the intervention started, immediately after the intervention and follow-up or 4 weeks after the intervention), and the comparison group was measured across two time points (4 weeks before the intervention started and during follow-up). Quantitative and qualitative methods were used to analyse the findings. The findings demonstrated an increase in self-emotion appraisal scores of the intervention group compared to the comparison group. Repeated measures revealed an increase in self-emotion appraisal and others' emotion appraisal scores for the intervention group. These findings were corroborated by qualitative findings, which highlighted that the participants found the intervention relevant to the education field. Although participants expressed that the intervention was too short, they asserted that it provided a space for them to share their experiences, an element which is fundamental to the negotiation of identity. Policymakers can strengthen PSTs' identities by institutionalising interventions with emotional intelligence and growth mindset elements. Such interventions must be integrated into the teacher education curriculum to develop teachers, specifically in resource-constrained South African education contexts. Future research should further contextualise EI and growth mindset interventions by applying them at scale, using robust methodologies.

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1. Introduction

Teachers in post-apartheid South Africa play a significant role in a social transformation project that seeks to provide just and equitable education systems. Since the advent of a democratic ideology, the South African education system has undergone significant restructuring to address the imbalances created by the segregated apartheid system (Soudien et al., 2022). Nevertheless, teachers experience insurmountable challenges, such as a lack of theoretical knowledge, a lack of training in the principles informing the implementation of curriculum change, a lack of resources, workload coupled with little time for teaching and learning, overcrowded classrooms and poor subject content foundation in learners (Du Plessis & Letshwene, 2020; Letshwene & Du Plessis, 2021; Maharajh et al., 2016). Psychological issues, including stress and burnout among South African teachers, have also been reported (Ndebele et al., 2022).

However, this is a worldwide phenomenon. Teaching is positioned as an emotional and stressful occupation where teachers are more susceptible to deteriorating mental health (Baka, 2015; Beltman & Poultan, 2019; De Simone & Lampis, 2016; Schmid & Thomas, 2020; Skaalvik & Skaalvik, 2020). In a scoping review conducted by Agyapong et al. (2022), the findings indicated that the prevalence of burnout among teachers ranged from 25.12% to 74%, stress ranged from 8.3% to 87.1%, anxiety ranged from 38% to 41.2%, and depression ranged from 4% to 77%. Preservice teachers (PSTs) are said to be most vulnerable to these experiences as they still construct their identities. They may not cope with the stressors found in the early years of their careers, which may lead to attrition (Wang et al., 2025).

Researchers and educators are placing growing emphasis on emotional intelligence (EI) and a growth mindset as key factors in fostering supportive and enriching learning environments. EI, which is defined as the ability to understand and manage emotions, has been correlated with teacher well-being and teacher effectiveness (Puertas Molero et al., 2019). This has exacerbated the implementation of socio-emotional learning (SEL) programmes in education contexts (Durlak et al., 2022; Weissberg, 2019). Growth mindset, a belief that human attributes are malleable and can be developed through effort and persistence, has also been influential in education research. Growth mindset and growth mindset interventions are associated with positive outcomes, such as well-being and resilience (Zeng et al., 2016).

Nevertheless, EI and mindset interventions have been largely applied in resource-rich, Western contexts, overlooking resource-constrained environments such as in South Africa, where their application may be shaped by unique social factors. There is also a lack of studies investigating the combination of EI and growth mindsets for favourable outcomes. One study by Cabello and Fernández-Berrocal (2015) concluded that growth mindsets should be incorporated into EI training programmes for more sustainable results. It is envisaged that teaching a growth

mindset may further enhance the development of emotional abilities. This is based on the premise that once individuals recognise their capacity to improve abilities such as intelligence, they are more likely to be open to enhancing their emotional regulation skills. To this effect, this study proposes an integrated intervention consisting of growth mindset and EI psychological theories. It aims to investigate the impact of this integrated intervention on PSTs' mindsets and EI. The integrated intervention is expected to positively influence the professional identities of pre-service teachers (PSTs), offering valuable insights for both initial teacher education and ongoing professional development.

2. Literature Review

Teachers negotiate their identity through personal and emotional experiences, social context and the political environment (Zembylas & Chubbuck, 2014). As Edwards and Burns (2016, p.735) contend, teacher identity is ''dynamic, multifaceted and co-constructed''. Teachers' professional identities are crucial in understanding other aspects, such as their teaching philosophy, commitment to education, and resilience (Hong et al., 2017). A positive, professional identity will likely enhance teachers' emotional connection to their work and work environment. Consequently, educational research must focus on the elements that shape teacher identity, especially in the South African context that is characterised by the enduring legacy of apartheid inequality. Research posits that emotions and belief systems are constituents of identity formation (Bukor, 2015; Zembylas & Chubbuck, 2014).

Emotions are central to the teaching profession. Teachers may experience enjoyment, anger or anxiety (Frenzel et al., 2016). Teachers can feel joy while teaching, frustration in response to student misbehaviour, and anxiety when faced with difficult situations. In South Africa, these emotional experiences are shaped by a lack of resources, poor school governance and broader socio-economic issues (Mouton et al., 2013). These emotions are frequent and may significantly impact teachers' identities, learners, and the teaching process (Wu & Chen, 2018). They might also alter teachers' beliefs about their abilities and how they perceive the teaching profession, particularly PSTs or teachers in training in the early phases of identity formation (Nichols et al., 2017; Teng, 2017). Given the emotional nature of teaching, emotional intelligence (EI) could be a beneficial personal resource for teachers and PSTs as they make sense of their identities.

EI can be understood as the ability to process emotions and effectively use them to solve problems (Salovey & Mayer, 1990). The concept of EI first emerged from Thorndike's (1920) (as cited in Heggestad, 2008, p.103) concept of social intelligence, defined as the ''ability to manage and understand men and women, boys and girls to act wisely in human interactions''. It was also identified in Payne's (1986) dissertation, where he spoke of emotional awareness. Salovey and Mayer (1990) formally conceptualised EI, popularised by Daniel Goleman's book entitled *Emotional Intelligence: Why it can matter more than IQ*. Nevertheless, EI is a contentious concept with different models. The literature groups emotional intelligence (EI) into three main types: ability EI, trait EI, and mixed models. This classification has led to a divide in EI research and has resulted in varied

measurement approaches, adding complexity to how the concept is defined and applied. This study was based on the ability-based EI model. Salovey and Mayer (1990) considered EI an ability and a type of intelligence, hence the term 'ability EI'. According to this model, EI comprises mental abilities that can be hierarchically organised, from lower-functioning skills to higher-functioning skills (Mayer et al., 1999). The four dimensions of ability EI are a) Perceiving emotion (i.e. the ability to identify and express emotions accurately), b) Facilitating thought using emotion (i.e. the ability to effectively solve problems based on emotions and generate positive emotions about experiences), c) Understanding emotion (i.e. the ability to understand emotions and their causes and consequences) and d) Managing emotion (i.e. the ability to manage one's and others' emotions effectively) (Mayer et al., 2016).

The ability EI model was chosen for this study as it has been accepted by most researchers (Haag et al., 2023; Mayer & Caruso, 2025; Taibolatov et al., 2025). There is strong evidence that this model is more precise about well-specified EI dimensions than other EI models (Murphy, 2014). Existing research argues that other EI models are over-inclusive and seem to haphazardly include all the positive qualities that are not part of cognitive intelligence (Antonakis & Dietz, 2010; Haag et al., 2023). The ability EI model provides a clear conceptual definition of EI and stipulates that EI is a set of abilities that is amenable to change through training programmes (Taibolatov et al., 2025). Notwithstanding the various models, research demonstrates that EI is significant in the education field. Teachers high in EI are said to be caring and supportive, which translates into improved learner achievement (Dolev & Leshem, 2017).

In addition to emotional states, teachers' beliefs also affect identity formation, subsequently affecting attitudes and pedagogical practice. Experienced teachers and PSTs espouse certain beliefs about themselves, others and their professional practice (Devine et al., 2013). Teacher beliefs influence their behaviour and instructional strategies (Rodgers et al., 2022). In the quest to understand the impact of internal beliefs, Dweck's (1986) concept of mindsets has gained momentum within the psychology and education community. Mindsets or implicit theories are beliefs that people hold about their attributes (e.g., intelligence, personality, emotion, etc.) (Dweck & Yeager, 2019). These beliefs influence cognition and behaviour (Dweck & Yeager, 2019).

In her model, Dweck (1986) distinguishes between a fixed mindset or entity theory (i.e., a belief that human attributes are fixed and cannot be developed) and a growth mindset or incremental theory (i.e., a belief that human attributes can be developed and improved through effort and persistence). A fixed mindset has been associated with negative outcomes, such as poor mental health, whereas a growth mindset has been associated with positive outcomes, such as well-being (Altikulaç et al., 2024; Fan et al., 2025). Few studies on teacher mindsets demonstrate that these beliefs affect teachers' instructional behaviour and learners' academic achievement (Bardach et al., 2024; Tao et al., 2021). For instance, a teacher who is confident in their abilities and believes that learners can improve their abilities may provide extra support, potentially leading to student engagement and academic success.

Existing literature demonstrates the relevance of EI and mindsets in teacher identity construction. To this end, the trainability of EI and growth mindsets is of particular interest. Research evidence reveals that EI abilities and growth mindsets can be trained or developed (Burnette et al., 2023; Castillo-Gualda et al., 2018). This study aimed to develop and evaluate a brief integrated intervention grounded on mindsets and EI psychological theories. This study employed a mixed-methods approach to gain a comprehensive understanding of how the intervention impacted pre-service teachers (PSTs) in South Africa. The present study's contribution to the existing body of knowledge is two-fold.

Firstly, it seeks to demonstrate a pragmatic link between EI and mindsets or implicit theories. Secondly, there is scant research on EI and mindset interventions targeting teachers and PSTs in the South African context. Therefore, this study seeks to address this gap by using PSTs as a sample. Understanding that a growth mindset can be fostered and that EI abilities can be developed can have substantial practical implications for teacher development practices. In addition, most intervention studies are based in Western countries with different cultural interpretations and ways of understanding (Appiah, 2022). Examining the impact of this intervention in a South African education context allows for an appreciation and acknowledgement of social factors that influence and shape PSTs' professional identities.

This study was guided by the following question:
- How does participation in a brief growth mindset and emotional intelligence (GMEI) intervention affect preservice teachers' emotional intelligence and mindsets?

The study hypotheses are as follows:
- (H1) The intervention group will demonstrate an increase in emotional intelligence and its subscales post-intervention
- (H2) The intervention group will demonstrate a growth mindset in all implicit theories (i.e. intelligence, personality and emotion) post-intervention

3. Methodology
This study adopted a quasi-experimental, mixed-methods design. Quasi-experimental designs are considered powerful in field settings as they seek to examine the causal effect of interventions without randomly assigning participants (Boudewijns et al., 2019; Price et al., 2015). A combination of qualitative and quantitative research methods strengthened the study by capitalising on the strengths of these approaches (Creswell & Clark, 2017).

Before data collection commenced, two ethical clearance permissions were sought from the University of Nottingham, Division of Psychiatry & Applied Psychology, to conduct the main intervention study and qualitative interviews. Permission was also sought from the two universities. After permission had been sought from the universities, participant recruitment began.

The study included both an intervention and a comparison group. The intervention group consisted of people who completed the full intervention, while the comparison group consisted of people who did not attend or who attended the first session but were unable to continue with the remaining sessions due to conflicts in their schedules. The intervention group was assessed at four time points: Time 1 (four weeks before the intervention), Time 2 (immediately beforehand), Time 3 (immediately after), and Time 4 (four weeks after the intervention). Due to time constraints, the comparison group was assessed only at Time 1 and Time 4. A qualitative approach was also used to understand participants' experience of the intervention, obtained two months after its conclusion.

Convenience and purposeful sampling techniques were used to select participants. Participants were selected based on study purpose, availability and willingness to participate. This study comprised 168 final-year PSTs registered for a four-year Bachelor of Education degree in two institutions of higher learning based in South Africa, KwaZulu Natal. Three main tertiary institutions in the KwaZulu-Natal province offer a four-year Bachelor of Education qualification. In South Africa, students enrolled in this degree undergo teaching practice or school experience from the second year of study. This practical component is governed by the South African Department of Higher Education and Training. It mainly ensures that students are equipped with the necessary skills and competencies required for professional teaching. Thus, all PSTs who participated in the study had some teaching practice as part of their education qualification.

An intervention group (n = 86) consisted of participants who underwent a brief growth mindset and emotional intelligence (GMEI) training programme, and the comparison group (n = 82) consisted of participants who did not attend the programme or who only attended the first session. Most participants were female, 118 (70.2 %), compared to 50 (29.8%) males. Most participants were in the 21-30 age group, 164 (97.6%), compared to only 2 (1.2 %) in the 20 years and younger group and 31-40 age groups, respectively.

In terms of subject knowledge, 80 (47.6%) participants specialise in Maths, Science, and Technology, followed by those specialising in Economics and Management Science 50 (29.8%), followed by the Social Sciences 32 (19.0%), and lastly, those specialising in Life Orientation and Language Education 5 (3.0%). Participants who engaged in an interview were those who attended all the intervention sessions. 13 participants were interviewed. Of the 13 participants, 7 were female, whilst 6 were male.

3.1 A Brief Growth Mindset and Emotional Intelligence Intervention
The intervention consisted of four sessions of approximately an hour each, running for four separate days. The first session focused on Dweck's (1986) mindset theory. Participants were taught about the difference between a growth and a fixed mindset and the consequences of each. The main message of this session was that the brain changes and forms new connections through learning. As part of an activity, participants were asked to read an article entitled '*You can grow your intelligence*' *and write a letter to their future learners explaining how the brain*

develops and learns through challenges and effort (DeBacker et al., 2018; Yeager et al., 2016). This activity, known as the 'self-persuasion task', is predicated on the premise that when individuals communicate a message to someone else, it can convince them to believe in the message (Yeager et al., 2016).

Moreover, the subsequent three sessions dealt with the EI component. The main objectives of these sessions were to develop participants' EI abilities as denoted in Salovey and Mayer's (1990) EI model, i.e., perceiving emotions, using emotions, understanding emotions and managing emotions. Participants were provided with broad knowledge of the impact of emotions on cognition and behaviour. Activities included in the EI sessions were aimed at building self-awareness and equipping participants with emotion management tools. These included the mood meter activity, role-plays, the three good-things activity and mindfulness.

3.2 Research Instruments
3.2.1 Quantitative Measures
EI was measured using the Wong and Law Emotional Intelligence Scale (WLEIS) developed by Wong and Law in 2002. It includes four components, i.e., Self-Emotion Appraisal (SEA); Others' Emotion Appraisal (OEA); Use of Emotion (UOE) and Regulation of Emotion (ROE) (Law et al., 2004; Wong & Law, 2002). SEA is the ability to understand and express emotions; OEA is the ability to perceive and understand others' emotions; UOE is the ability to make use of emotions to make decisions, and ROE is the ability to regulate emotions (Law et al., 2004; Wong & Law, 2002). This scale consists of 16 items measured on a 5-point Likert scale (1= strongly disagree; 5= strongly agree).

All items are positively worded, and total scores were calculated by computing the total mean scores. A high total score represents high emotional intelligence. The original version of the WLEIS reported good internal consistency reliabilities, which ranged from .83 to .90 (Wong and Law, 2002). The scale has shown good reliabilities of over .70 in various studies using diverse samples (Carvalho et al., 2016; Sulaiman & Noor, 2015).

The Implicit Theories of Intelligence Scale (ITI) by Dweck and Henderson (1988) was used to measure implicit theories of intelligence. This scale has reported good internal consistency with Cronbach's alphas of over .70 in various studies (Rammstedt et al., 2022; Rudnova et al., 2023). The measure of implicit theories of personality was measured using the Measure of Implicit Person Theories (ITP) developed by Chiu et al. (1997). This measure also consists of 3 items measuring a fixed mindset. Studies have revealed this scale to be a reliable measure, with internal reliabilities of over .70 (Chen et al., 2023; Rutledge et al., 2018).

Lastly, beliefs about the nature of emotions were measured with the Implicit Theories of Emotion (ITE) scale developed by Tamir et al. (2007). This scale consists of 4 items, with two items representing a fixed mindset and the other two items representing a growth mindset or an incremental theory. This measure has been largely used to measure the implicit theories of emotions and has been reported to have good internal reliability of over .70 (Congard et al., 2022; Gutentag et al., 2022).

All implicit theory measures were measured on a 6-point Likert scale (1=strongly disagree; 6=strongly agree). In line with past research, all items representing a fixed mindset were reverse-scored and mean scores were computed. Lower scores indicated a fixed mindset, and higher scores represented a growth mindset.

3.2.2 Qualitative Measure
Thirteen semi-structured, telephone interviews were conducted post-intervention to understand participants' perceptions about the impact of the intervention, including their views about the implementation and process followed. The qualitative process evaluation component was included to unveil participants' perceptions about the implementation and content of the intervention. This was guided by Nielsen and Randall's (2013) intervention evaluation framework, which includes intervention context, mental models and intervention implementation and design.

In this study, only the mental models and intervention implementation and design were included. The mental models dimension deals with participants' perceptions and reactions towards the programme, whereas the intervention implementation and design dimension focus on the processes employed, such as recruitment strategies and reactions of participants towards the content and delivery of the intervention (Nielsen & Randall, 2013).

4. Data Analysis
Data from the questionnaires and the evaluation form were analysed using the IBM Statistical Package for Social Sciences (SPSS) version 27. A mixed multifactorial analysis of variance (Mixed ANOVA) and a repeated-measures ANOVA were performed to test the impact of the intervention on EI and implicit theories. In this study, both the intervention and the comparison group were measured at two time points (i.e., Time 1 and Time 4). Thus, data from Time 1 (pre-intervention) and Time 4 (follow-up) were used to carry out this statistical analysis.

Thematic analysis (TA) was employed to analyse qualitative data (Braun et al., 2016). This included familiarisation with the data; generating initial codes where interviews were imported into the NVivo software; developing themes; refining and defining themes where themes were organised according to Neilsen and Randall's (2013) evaluation framework.

5. Results
Mixed ANOVAs and repeated measures ANOVA were performed to assess the quantitative impact of the intervention on the participants' EI and mindsets (i.e. implicit theory of intelligence, personality and emotion). Mixed ANOVAs were performed across two time periods (Time 1, pre-intervention and Time 4, follow-up). A series of repeated measures ANOVA was run to investigate the change in EI and implicit theories over the four time periods (Time 1, four weeks before the intervention, Time 2, immediately before the intervention, Time 3, immediately after the intervention, Time 4, four weeks after the intervention). Only the intervention group was included in the repeated measures ANOVA analysis.

Assumptions were tested before the analysis, and a Greenhouse-Geisser correction was applied in cases where Mauchly's test of sphericity was violated in the repeated measures ANOVA analyses.

5.1 The quantitative impact of the intervention on the participants' EI

Mixed ANOVA results indicated that there was no significant interaction between time and group for total EI, $F (1, 156) = 2.78$, $p = .10$, partial $\eta^2 = .02$.

Mixed ANOVA was computed for all the EI subscales, i.e., self-emotion appraisal, others' emotion appraisal, use of emotion and regulation of emotion. The findings revealed a significant interaction between group and time, $F (1, 155) = 5.62$, $p = .02$, partial $\eta^2 = .04$. Thus, there was a significant difference in SEA scores across the intervention and comparison groups at different time points. Separate between-subjects and within-subjects ANOVAs were performed to explore these differences further. Between-subject ANOVAs were conducted to test the differences between groups (i.e., intervention and comparison) at Time 1 and Time 4. This analysis revealed a non-significant difference in SEA scores between the intervention and the comparison group at Time 1 ($p = .25$).

Interestingly, there was a significant difference in scores between groups at Time 4: $F (1, 161) = 22.69$, $p = .00$, partial $\eta^2 = .12$. The intervention group demonstrated higher mean scores ($M = 4.27$; $SD = .39$) compared to the comparison group ($M = 3.93$; $SD = .54$). Furthermore, within-subject ANOVAs were performed to explore the differences in SEA scores between Time 1 and Time 4 for each group. For the intervention group, SEA scores increased significantly over time; $F (1, 81) = 9.02$, $p = .004$, partial $\eta^2 = .10$.

Mean scores for the intervention group were slightly higher at Time 4 ($M = 4.28$; $SD = .38$) compared to mean scores at Time 1 ($M = 4.10$; $SD = .48$). The change in scores over time for the comparison group was non-significant ($p = .49$). The Mixed ANOVA findings were non-significant for the other subscales i.e. Others' Emotion Appraisal (OEA) $F (1, 150) = 1.14$, $p = .29$, partial $\eta^2 = .01$; Use of Emotion (UOE) $F (1, 158) = .04$, $p = .84$, partial $\eta^2 = .00$ and Regulation of Emotion (ROE) $F (1, 152) = .90$, $p = .35$, partial $\eta^2 = .01$.

Repeated measures ANOVA findings for total EI indicated a significant difference between the four-time points $F (2.73, 215.62) = 5.96$, $p = .00$, partial $\eta^2 = .07$. Bonferroni post hoc tests demonstrated significant mean differences between Time 1 ($M = .4.02$, $SD = .37$) and Time 3 (M =4.16, $SD = .30$). In addition, mean scores at Time 2 ($M = 3.99$, $SD = .39$) statistically differed from those at Time 3 ($M = 4.16$, SD= .30) and Time 4 ($M = 4.14$, $SD = .31$). In addition, results also revealed significant differences between four-time points on the EI subscales.

For self-emotion appraisal (SEA), findings indicated significant differences in mean scores between the four-time points, $F (3, 237) = 7.32$, $p = .00$, partial $\eta^2 = .09$. Bonferroni post hoc tests demonstrated significant mean differences between Time 1 ($M = 4.09$, $SD = .48$) and Time 4 ($M = 4.28$, $SD = .39$). Mean scores at Time 2 ($M = 4.03$, $SD = .51$) statistically differed from those at Time 3 ($M = 4.22$, $SD = .39$)

and Time 4 (*M* = 4.28, *SD*= .39). For others' emotion appraisal (OEA), results revealed differences in mean scores between the four-time points, *F* (3, 240) = 3.95, *p* = .01, partial η² = .05. Post hoc tests indicated a difference in mean scores between Time 1 (*M* = 3.75, *SD*= .50) and Time 3 (*M* = 3.94, *SD* =.47). Furthermore, for use of emotion (UOE), the findings demonstrated a statistically significant difference between the four-time points, *F* (2.69, 207.22) = 2.71, *p* =.05, partial η² = .03. However, post hoc tests did not yield any significant differences between time points. Lastly, there was no significant difference in mean scores between four-time points for regulation of emotion (ROE), *F* (3, 204) = 1.72, *p* =.17, partial η² = .03.

5.2 The quantitative impact of the intervention on the participants' Mindset

Mixed ANOVA results indicated a significant interaction between group and time for implicit theories of intelligence (ITI), *F* (1, 166) = 9.84, *p* = .00, partial η² = .06. These findings suggest a significant difference in ITI scores across the intervention and comparison groups at different time points. To further investigate this difference, separate between-subjects and within-subjects ANOVAs were carried out. Between-subjects ANOVA was performed separately to test the differences between groups (i.e., intervention and comparison) at Time 1 and Time 4. Results indicated that there was no significant difference in ITI scores between the intervention and the comparison group (*p* = .95) at Time 1.

However, at Time 4, there was a significant difference in ITI scores between groups: *F* (1, 166) = 14.28, *p* = .00, partial η² = .08. The intervention group demonstrated higher mean scores (*M* = 3.66; *SD* = 1.29) than the comparison group (*M* = 2.91; *SD* = 1.14). Moreover, within-subjects ANOVA was carried out to examine the differences in ITI scores between the two time points for each group. Results showed that for the intervention group, ITI scores increased significantly over time; *F* (1, 85) = 19.84, *p* = .00, partial η² = .19. Mean scores for this group were lower at Time 1 (*M* = 2.93; *SD* = 1.13) compared to the mean scores at Time 4 (*M* = 3.66; *SD*= 1.39). On the other hand, the change in ITI scores over time for the comparison group was non-significant (*p* = .88).

Mixed ANOVA results revealed a non-significant interaction between group and time for implicit theories of personality (ITP) *F* (1, 166) = 2.67, p = .11, partial η² = .02 and for implicit theories of emotion (ITE) *F* (1, 166) = .03, *p* = .53, partial η² = .00. Overall, the interaction between time and group was significant for only ITI. Results indicated an increase in ITI scores over time for the intervention group. The intervention group also showed higher ITI scores than the comparison group.

Repeated measures ANOVA findings demonstrated a significant effect for time, suggesting mean differences between the four-time points for implicit theories of intelligence (ITI) *F* (2.57, 218.41) = 9.72, p =.00, partial η² =.10. Bonferroni post hoc tests demonstrated significant mean differences between Time 1 (*M* = 217 2.93; *SD* = 1.13) and Time 3 (*M* = 3.39; *SD* = 1.35). Time 1 (*M* = 2.93; *SD* = 1.13) was also statistically significant from Time 4 (*M* = 3.66; *SD* = 1.39).

In addition, there was a significant difference in mean scores between Time 2 (M = 3.13; SD = 1.23) and Time 4 (M = 3.66; SD = 1.39). For implicit person theories (ITP), results also indicated a significant difference in mean scores between the four-time points, F (2.72, 230.97) = 3.88, p =.01, partial η² .04. Post hoc tests revealed a significant difference in mean scores between Time 1 (M =2.94; SD = 1.15) and Time 4 (M = 3.40; SD = 1.40). Lastly, there was also a significant difference in mean scores between the four-time points for implicit theories of emotion (ITE) F (3, 255) = 3.82, p = .01, partial η² = .04. Post hoc tests demonstrated significant mean differences between Time 2 (M = 4.12, SD = .82) and Time 4 (M = 4.46, SD = .88).

5.3 Qualitative Findings
5.3.1 Mental Models
This dimension is concerned with participants' perceptions and experiences during the intervention. Themes in this dimension reveal participants' views, experiences, and reactions toward the intervention. Participants indicated that the intervention is relevant and valuable in their field. They also stated that the intervention culminated in significant positive change. The themes are presented below.

Theme 1: Relevance of the Growth Mindset and Emotional Intelligence Intervention in the Education Field
All participants revealed that the intervention (i.e., especially the emotional intelligence component) is valuable in the teaching practice. They stated that the information from the intervention could assist teachers in effectively coping with the challenges of the teaching practice, such as dealing with misbehaving learners. For example, P5 reported:

> *''I think this programme can help teachers a lot because they are working with learners, and learners sometimes misbehave. So, when they are aware of their emotions and are able to control them, they will be able to control learners' emotions because it will be easy for them to understand learners' emotions and understand why they behave the way they do''.*

P12 further substantiated this point and added that the skills gained during the intervention could be used as an alternative to corporal punishment.
P12 stated

> *''Well, since I am an educator, it is very important because I deal with learners. Some [learners] come with different backgrounds where discipline--where it does not exist. For some, discipline exists, but in a different way. So, when I am mad, I must find an appropriate way to deal with learners. So, it is very important that I am able to control my emotions so that I don't hurt anybody, and I don't break the rules. Since, especially in schools now, corporal punishment does not work, so you have to find a better way to deal with things''.*

Theme 2: 'It was developmental.'
Overall, participants perceived the intervention as developmental and educational. They commented on how it contributed to their self-awareness and personal development. Participants also shared how the intervention changed

their perceptions and attitudes. This was a critical moment as they reflected on the skills gained and reconstructed their professional identities.
P1 said,

> ''I think the programme was developmental. It also contributed much to my well-being''.

P10 also attested that she acquired self-awareness skills to recognise, understand and manage her and others' emotions.
She reported,

> ''The programme helped me to develop my self-esteem. It helped me to develop my self-control and improve my self-awareness. It helped me to recognise my emotions and other people's emotions. And now I am able to create healthier relationships with others''.

Furthermore, for some participants, not only did it contribute to their personal growth, but it changed their mindsets, perceptions, and attitudes.
P2 reported,

> ''After the programme, I have changed my perception on how I view things pertaining the experiences of other people''.

5.3.2 Intervention design and implementation
Themes under this dimension include participants' perceptions regarding the design or content of the intervention. The participants revealed that the lessons were structured and well delivered. They also stated that the lessons provided a space for them to interact and share ideas. Most interestingly, participants shared their views on the short dosage of the intervention. These themes are presented separately below.

Theme 3: Enjoyed the Lessons
Participants revealed that they enjoyed the discussions and interactions during the programme. They indicated that the intervention provided a space for them to share their views and experiences. This was a way for participants to engage in dialogue that further enabled the co-construction of identities.
P1 reported,

> ''I think talking was very much remarkable. Having the opportunity to talk freely about something we are afraid to talk about or confront. I think that was something remarkable about this programme''.

Similarly, P10 stated,

> ''I enjoyed because I was able to express my feelings. I also enjoyed sharing my ideas and opinions with others and hearing other people's ideas and opinions''.

Theme 4: 'It was too short': Dosage not enough.
Despite the enthusiasm, most participants indicated that the intervention was rather too short. They stated that it limited them from fully expressing themselves and fully understanding the intervention's content.

P6 stated,
> *''I think it was too short for me because we did touch everything, but some people were not given enough platform to express themselves because of time''.*

Similarly, P9 said,
> *''It was too short. Yes, we did learn a lot, but I feel like there are some other things we could have learnt''.*

On the same note, P12 reported,
> *''It was too short, because, you remember, most of us had something to say, but then we were deprived of the opportunity, because of time''.* She further stated, *''Emotional Intelligence is very complex, so I think it requires a lot of time to talk about it''.*

P13 also reported
> *''I think the time was too short because there is a lot we still wanted to learn and understand''.*

6. Discussion

This study aimed to investigate the impact of a brief Growth Mindset and Emotional Intelligence (GMEI) training programme. The main aim was to examine whether this training programme could strengthen PSTs' professional identities by enhancing their EI abilities and cultivating a growth mindset. This study was founded on two hypotheses. The first prediction was that the intervention group would demonstrate an increase in EI and its subscales post-intervention compared to the comparison group. This prediction was partially supported. Mixed ANOVA results showed no interaction between group and time for total EI, which signalled a nonsignificant difference between the intervention and the comparison group.

However, a positive change in one EI subscale (i.e. self-emotional appraisal or SEA) was observed. Results indicated a significant difference in SEA between the intervention and the comparison group, where the intervention group showed significantly higher mean scores. Therefore, the intervention group acquired the ability to understand their emotions post-intervention. It is worth noting that the intervention group showed an increase in total EI over time. Only two EI subscales (i.e., self-emotional appraisal and others' emotion appraisal) demonstrated a significant increase in scores for the intervention group post-intervention.

The qualitative findings corroborate these positive results. Drawing from participants' voices, the intervention included in this study is relevant to the education field and developmental in nature. Through this programme, participants shared that they acquired essential self-awareness skills and gained crucial skills that they can use to handle challenging experiences, such as dealing with misbehaving learners. The findings of this study are in line with previous research, which has revealed that EI abilities can be improved through training (Taibolatov et al., 2025).

Understanding ones and others' emotions is a fundamental skill for teachers, especially in the South African education context. Notwithstanding the emotional nature of the teaching field, teachers in South Africa, especially those working in rural areas and townships, are faced with poor resources, misbehaving learners who mostly come from poor backgrounds, governance, and broader socio-economic issues (Du Plessis & Letshwene, 2020; Letshwene & Du Plessis, 2021 Maharajh et al., 2016). These conditions are likely to breed negative emotions, which may negatively affect teacher commitment and their connection to their work. When teachers are aware of their emotions, they can understand their underlying causes and behavioural consequences, which may in turn lead to self-regulation and the use of effective emotion management strategies. Socially and emotionally competent teachers tend to be supportive and focus more on learners' strengths and abilities (Dolev & Leshem, 2017).

Consequently, they could nurture learners and act as responsible leaders who are concerned about contributing to the creation of equitable and sustainable education systems. Nevertheless, it is well noted that the intervention did not enhance all EI abilities. A possible explanation for this could be the duration of the intervention. Participants revealed that the intervention was too short and insufficient to understand and apply the knowledge learned. Individuals need more time to develop EI abilities, which may not be easily achieved with only four sessions. The dose delivered, which refers to the amount of intervention delivered to participants, can affect the programme's overall impact (Connolly et al., 2025).

The second hypothesis of the study was that the intervention group would demonstrate a growth mindset in all implicit theories (i.e., intelligence, personality, and emotion) post-intervention. This hypothesis was also partially supported. Findings revealed a significant difference only in implicit theories of intelligence (ITI) between the intervention and the comparison group postintervention. ITI scores for the intervention group also increased over time, indicating that the intervention group believed intelligence was malleable post-intervention. Although ITP and ITE did not reach a significant interaction effect between group and time, when inspected alone in the repeated-measure analysis, the intervention group demonstrated growth mindsets in both ITP and ITE post-intervention. These results correspond to a plethora of prior research, which concluded that a growth mindset could be taught (Schleider & Weisz, 2018; Yeager & Dweck, 2020).

Additionally, the qualitative results from this study indicate that the intervention influenced pre-service teachers' beliefs and attitudes. Participants reported that the skills they acquired were developmental and led to a shift in their perspectives. This potentially enhanced the confidence in their abilities to deal with challenging experiences in the education field. Teachers' beliefs about themselves and others shape their identities, consequently influencing their behaviours and instructional strategies (Rodgers et al., 2022). Specifically, espousing a growth mindset and believing that characteristics and abilities such as intelligence and personality could be developed and changed through effort and persistence could bear tremendous results.

Research indicates that teachers with a growth mindset positively influence learners' mindsets and tend to experience enjoyment and engagement when teaching (Frondozo et al., 2022; Mesler et al., 2021). It is conceivable that teachers with these qualities would instil resilience, specifically in resource-constrained South African education contexts.

Most importantly, the intervention offered PSTs a space to negotiate and renegotiate their identities as they shared their emotions and experiences. Participants enjoyed expressing themselves and exchanging their ideas and opinions, especially about things that they were uncomfortable opening up about. This is crucial for identity formation. Identity is formed through dialogue and through interacting with others (Rodgers & Scott, 2008). The importance of the narrative construction of identities has been explored in the literature. Chu (2021) highlighted the essential role of shared stories and collaboration in the construction of identities. Student teacher peer groups are regarded as safe spaces where PSTs can freely express their feelings of inadequacy, fear, and joy (Karlsson, 2013).

Such spaces are likely to offer PSTs opportunities to engage in critical reflection whilst challenging their existing views about teaching and learning (Chu, 2021). Taken together, this study revealed a shared sense of appreciation for peer groups or peer learning. This consolidated an idea that peer groups should be integrated into teacher education and training programmes to enable critical reflection, peer support and coaching.

7. Conclusion: Practical and Policy Implications

This study aimed to investigate the impact of a brief Growth Mindset and Emotional Intelligence (GMEI) intervention. The findings of the study revealed that this intervention enhanced some EI abilities, more specifically self-emotion appraisal and others' emotion appraisal. The intervention also shaped PSTs' mindsets as post-intervention, they seem to hold a belief that personal characteristics such as intelligence are malleable through effort and persistence.

In the qualitative findings, PSTs emphasised the relevance of such interventions in the education field. Most importantly, the intervention became a tool and a space for PSTs to narrate their experiences, which is fundamental to their professional identity formation. Although participants felt that the intervention was too short, they shared that the experience contributed to their self-awareness and development. Ultimately, the study underscores the significance of EI and growth mindset in the education field, highlighting the training programme as a powerful resource and space for shaping PSTs' mindsets and professional identities.

The findings of this study have significant practical implications. An intervention of this nature could contribute to 'humanised', positive education contexts. A positive education environment is likely to enhance teacher well-being, leading to quality education. Against this backdrop, policymakers could include the

elements of this intervention in the South African teacher education and development policy framework. This could be included in the initial teaching training programmes at the institutions of higher learning, be part of teacher mentorship programmes and in teacher continuous professional development programmes.

8. Limitations and Directions for Future Research
Despite insightful findings, this study is not without its limitations and considerations for future research. The first limitation is the use of a quasi-experimental approach. Although multiple time points were employed to rule out some of the threats to internal validity, we cannot be certain that some factors did not impact the results of the study. The intervention and the comparison group in this study interacted closely; thus, it is likely that some of the content was shared. Contamination tends to reduce the intervention study's power to detect significant changes in outcomes (Armijo-Olivo et al., 2022). In addition, the comparison group was measured only at two time points, which may introduce bias from time-varying confounding effects (Basten et al., 2023).

To address these limitations, a longer-term follow-up could provide additional insights into the sustainability of PSTs' EI and mindsets. The second limitation is the small sample size. This study consisted of 86 participants for the intervention and 82 for the comparison group. Only 13 participants were available for the interviews. Small sample sizes have low statistical power needed to detect significant changes (Mascha & Vetter, 2018). The third and final limitation of this study is time constraints. Participants commented on the low dosage of the intervention. As a result, future education intervention studies should consider integrating the intervention into the education structure or curriculum to ensure effective implementation. Follow-up sessions may also be essential to cement the learnings to enable the holistic development of EI and growth mindset abilities.

Conflict of Interest
The authors declare that they have no conflicts of interest.

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