

Agreeing is Not the Same as Accepting: Exploring Pre-Service Teachers' Growth Mindsets

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Abstract: The popularity of mindset theory has resulted in a surge of mindset interventions in schools. However, with increased popularity, there is the potential for misunderstandings and hesitations about what a growth mindset fully entails. Therefore, we sought to disentangle which components of growth mindset messages pre-service teachers find hard to accept alongside their level of agreement with growth mindset questionnaire items. We used a descriptive design with both quantitative and qualitative data to explore 182 pre-service teachers' responses to growth mindset messages. The results of this study suggest that pre-service teachers hold a growth mindset. However, despite strong quantitative endorsements, in the qualitative analyses we determined three ways in which participants found a growth mindset hard to accept: (1) the notion of mindset theory itself, (2) the level of growth, (3) and the necessary actions behind having a growth mindset. The findings of this study suggest we need to pay close attention to false growth mindsets in theory and practice.

Keywords: Mindset Theory, Growth Mindset, False Growth Mindset, Pre-service Teachers

Introduction

Over the last decade, Carol Dweck's research on mindsets (Dweck, 1999) has gained immense popularity with over a million copies of *Mindset: The New Psychology of Success* (Dweck, 2006) sold. Her research has radically proposed that *everyone* can grow and improve. This notion resonates with teachers, many of whom enter the profession to help students learn and grow (Scholastic Inc. & the Bill & Melinda Gates Foundation, 2014). The popularity of mindset theory has resulted in a surge of formal mindset interventions in school systems (e.g., Brainology) and tools to assess levels of growth or fixed mindsets about learning (Dweck, 1999). Searching "mindsets" in Google results in thousands of informal pictures and activities that teachers can use including prompts for students to talk about challenging situations and how to overcome them, colouring sheets, and bulletin board displays. In alignment with the proliferation of materials, research shows that, quantitatively, mindset scores tend to be growth based (DeLuca et al., 2019; Guthsall, 2013, 2014).

Despite these strong endorsements, we wondered if pre-service teachers still found parts of this positive, growth-based messaging hard to accept. For example, do pre-service teachers truly believe that all students can grow? Increases in student diversity and classroom inclusivity may give teachers plenty of reasons to find this premise hard to accept. Indeed, it has been shown that teachers make different attributions (Frohlich et al., 2020) for students with disabilities and have different expectations based on student culture (Flanagan et al., 2020). In the same way that implicit biases can impact behavior (Ross, 2014), it may be that even when pre-service teachers agree with mindset statements, they actually find certain parts of the theory hard to accept in light of their personal teaching experiences and perspectives.

Overall, we believe there is a difference between agreeing with a growth mindset statement and internalizing the message, and giving it the credibility to incorporate in practice. Our concern is rooted in what Dweck has recently labeled "false growth mindsets" (Dweck & Yeager, 2019). Typically, a false growth mindset occurs when an individual states that they have a growth mindset, but they lack a full understanding of the effort and perseverance required to continuously challenge fixed mindsets and to implement strategies aligned with growth. Another type of false growth mindset might be when they state that they have a growth mindset but do not accept all the principles of growth mindset. In other words, they may lack appreciation or doubt the veracity of some components of a growth mindset. Therefore, our purpose was to disentangle which components of growth mindset messages pre-service teachers find hard to accept alongside their level of agreement with growth mindset questionnaire items.

Theoretical Framework: Mindset Theory

Originally referred to as *theories of intelligence*, mindset theory is a social-cognitive motivation theory that aims to understand implicit beliefs about abilities and intelligence (Dweck, 1999). Within the theory, Dweck (2006) described two broad paths of beliefs for intelligence: fixed or growth. First is the growth mindset where individuals

hold the belief that abilities and intelligence can be developed. When faced with a situation where they fail, an individual with a growth mindset may still experience strong emotions such as sadness or frustration; however, they tend to use this opportunity to learn more about themselves and what they can do to improve. Second is the fixed mindset where individuals hold the belief that intelligence is set in stone and nothing much can be done to change it. When an individual with a fixed mindset experiences failure, the setback is typically more impactful on their self-worth. Not surprisingly, Dweck advocated holding a growth mindset given the benefits.

A related motivational concept, achievement goal orientation, has been examined in academic settings in relation to mindsets. Individuals with performance goals are typically focused on proving their abilities, while individuals with mastery goals are focused on developing them. Researchers exploring the interconnectedness of these theories (Burnette et al. 2013) have found, in some cases, that a growth mindset correlates with holding mastery goals, while a fixed mindset correlates with holding performance goals about achievement (Dweck & Leggett, 1988). In such instances, Dweck (1988) has argued that individuals with a growth mindset tend to be more comfortable engaging in challenging tasks as they are motivated by the desire to learn and improve, while those with a fixed mindset might be more concerned with proving themselves through taking on easier tasks because they may think that their abilities are unchangeable (Dweck & Yeager, 2019).

Teacher Mindsets

As researchers gained understanding of mindsets in students, they turned their attention to teachers' mindsets, recognizing that teachers' beliefs may influence their classroom practices (Dweck, 2006, 2014; Rattan et al., 2012). Overall, teachers typically endorse more of a growth mindset than a fixed one (DeLuca et al., 2019; Guthsall, 2013, 2014). Pre-service teachers especially endorse a growth mindset because they tend to be highly optimistic about students' abilities prior to entering the field (Asbury et al., 2016). As such, teachers with a growth mindset are more likely to engage wholeheartedly in their work (Zeng et al., 2019). As a result, for example, in a small study Schmidt et al. (2015) found that students held greater mastery goals when their teacher actively engaged with a growth mindset framework.

Alternatively, teachers with fixed mindsets can negatively impact their students (Rattan et al., 2012). They tend to create classroom environments that are high-stakes and may encourage more performance-based goals, that is, goals focused on demonstrating competence such as getting good grades (Deemer, 2004). Teachers often believe that they are unable to control their students' success and, as a result, they attend to the high achieving students compared to those with educational challenges (Shim et al., 2013). Even when teachers are not explicit about holding a fixed mindset, if a student perceives that their teacher has a fixed mindset about their abilities, it can negatively impact the student's thoughts on their potential for growth (Gutshall, 2016; Mueller & Dweck, 1999).

Interventions. Because teachers' fixed mindsets can negatively impact students, interventions have been put into place to change teachers' mindsets from fixed to growth. In a study conducted by Seaton (2017), a mindset intervention was administered to a group of teachers over six sessions. Results demonstrated a significant shift to a growth mindset three months post-intervention. Further, Daniels et al. (2020b) designed a brief 50-minute online mindset intervention that increased a growth mindset, decreased a fixed mindset, and increased pre-service teachers' personal responsibility for student motivation relative to a control group. These results demonstrate that short interventions can change teachers' mindsets and thus potentially benefit their students.

False growth mindsets. Dweck and Yeager (2019) have argued that the proliferation and simplicity of mindset theory noted above may have unintentionally allowed people to hold a false growth mindset, meaning that teachers may fail to accurately understand the principles or practices associated with holding a growth mindset. For example, some teachers believe that a growth mindset is simply praising effort, while others have told their students that they can do anything they set their mind to without providing them with the support and strategies alongside (Osborne, 2013). A growth mindset not only includes believing that students' abilities can develop, it also includes building connections with students and providing strategies and resources for them to succeed (Dweck, 2016a). Without these additional supports, as mentioned by Dweck & Yeager (2019), teachers may be inadvertently harming their students when presenting growth mindset messages in their classroom. For example, if a teacher constantly praises the efforts of a struggling student without providing them support and strategies, the student may end up believing that even with effort they can't succeed. As such, Dweck & Yeager (2019) conclude that teachers may need more support in implementing a growth mindset than originally expected. Although a focus on shallow understanding has

been the main focus of false growth mindsets, another possibility is that pre-service found parts of mindset messaging hard to accept and this is the direction of the current research.

Current Study

Research surrounding mindsets supports the notion that teachers and pre-service teachers tend to willingly and strongly endorse a growth mindset about intelligence (Gutshall, 2013, 2014), but they might oversimplify this messaging (Dweck & Yeager, 2019). Given this strong endorsement by pre-service teachers and the trend of mindset theory interventions growing in popularity, it is important to identify any remaining stumbling blocks for pre-service teachers, particularly in light of the recent acknowledgement of false growth mindsets. As such, we sought to disentangle which components of growth mindset messages pre-service teachers find hard to accept alongside their level of agreement with growth mindset questionnaire items. To do this, we used a descriptive design with both quantitative and qualitative data to explore pre-service teachers' responses to growth mindset messages.

Method

Procedure

We recruited pre-service teachers at the University of Alberta through a participant pool that was hosted in a required second-year education course of a four-year program. Students who chose to participate signed up online and we provided them with the Survey Monkey study link. For this study, they answered a brief questionnaire including a mindset measure. Following the questionnaire, they watched a 16-minute video we created about mindsets and how teachers play an important role in fostering a growth mindset in students. We asked them to indicate if they had watched the whole video before they responded to open-ended questions about the content. This study received ethical approval from the University of Alberta Research Ethics Board.

Participants

A total of 213 participants accessed the study. We excluded 55 participants who indicated they did not watch the full video or did not answer the questionnaire, leaving a total of 147 participants for our sample. There were 110 women, 27 men, 4 non-binary individuals, and 6 participants who chose not to provide a gender response. The age of participants ranged from 18-45 years old ($M = 23.6$). Moreover, 78 were preparing to be elementary school teachers, 60 were preparing to be secondary teachers, and 9 who chose not to respond.

Materials

We used a combination of Likert questions and open-ended qualitative items to measure pre-service teachers' perspectives on mindsets. We also created a 16-minute educational mindset video that served as the reflection prompt (see link: <https://arpcresources.ca/consortia/shifting-mindsets/>).

Mindsets. In order to assess pre-service teachers' score on a growth mindset, we used a four-question measure adapted from the *Theories of Intelligence Scale* (Dweck, 1999). That is, we asked them the four growth statements from the original measure including: (1) Even your basic intelligence level can be increased considerably, (2) Your intelligence can always be substantially increased, (3) No matter how much intelligence you have, it can always be increased quite a bit, and (4) No matter who you are, your intelligence can be significantly increased. Participants responded to the four growth ($\alpha = .85$) statements about intelligence beliefs on a 6-point Likert scale from 1 (*Strongly disagree*) to 6 (*Strongly agree*). We used this adapted scale as it has evidence of high reliability ($\alpha = .90$) and high corrected item-total correlations ($\alpha = 0.71-0.79$) (Midkiff et al., 2018). Further, we were interested in growth mindset levels and researchers have recently suggested that a growth mindset and a fixed mindset are two separate constructs (Midkiff et al., 2018). Dweck's original work also supported using a 4-item scale (Dweck, 1999).

Video and manipulation check. Participants watched a 16-minute video that explained what it means to have a growth mindset, links to brain science, and possible strategies for teachers to help their students adopt a growth mindset. The video was originally created for informational purposes to a general audience and was not a specific intervention or teaching tool. In order to assess whether participants watched the full video, we asked them if they

watched the whole video, to which participants responded yes or no. Then, to precisely target places of resistance to the message, participants were asked to write a response to the following open-ended question: What is the hardest message in the video for you to accept?

Rationale for Analyses

For the quantitative analysis, we examined the descriptive statistics for pre-service teachers' scores on Dweck's (1999) measure of mindsets because we were interested in their levels of a growth mindset. In the open-ended qualitative section, we sought to identify places of resistance when it comes to accepting the principles of growth mindset theory presented in the video. We analyzed the qualitative data through an inductive thematic analysis (Nowell et al., 2017). We chose this approach of analysis for the qualitative piece as we held no prior schema or theory intended to test, rather, we had the goal of developing newly found patterns from the data.

Results

Descriptive Statistics

Pre-service teachers' mean score on the growth mindset questionnaire was $M = 17.59$ ($SD = 3.78$). This was well above the midpoint of 12, suggesting that most teachers agreed with growth items as seen in *Figure 1*. More specifically, cumulatively 92.5% of participants agreed with the growth items.

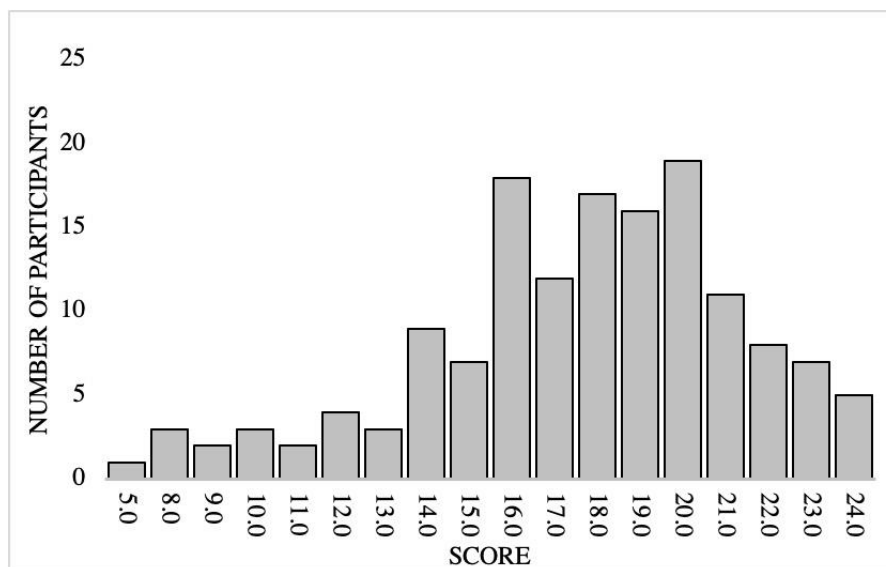


Figure 1: Mindset score frequencies. This figure shows the frequency of participants for each mindset score.

Thematic Analysis

We analyzed participants' written responses to the question: What is the hardest message in the video for you to accept? after watching a growth mindset video. We identified the following three themes: (1) disbelief, (2) lack of individual differences, and (3) action behind the belief (see *Figure 2*). The first author coded the data inductively and independently to identify themes. Then, themes were discussed amongst coders and verified by the second coder with 92% accuracy. They discussed differences until they reached a consensus.

The first theme we identified from the participants' responses was a *disbelief*, which questioned the notion of mindset constructs and theory in general. Within this theme, we identified four sub-themes: (a) fixed, (b) fixed as bad, (c) alternatives, and (d) neuroplasticity. Within the fixed sub-theme, participants questioned the veracity of the idea that individuals actually have fixed mindsets: “[I find it hard to accept] that there are actually people with fixed mindsets”, “[I find it hard to accept] that some people can't accept growth mindsets”. In contrast, some participants challenged if a fixed mindset is necessarily a bad thing, for example, “[I find it hard to accept] that fixed is bad”, “[I

find it hard to accept] that those with a negative or fixed mindset will be more easily disillusioned and won't be able to overcome challenges as easily". Participants also questioned whether there are additional mindsets such as: "I think there might be more alternatives". Finally, participants questioned the notion of neuroplasticity—or whether or not the brain is actually capable of changing—through comments such as: "[I find it hard to accept] that the brain can be significantly changed". Overall, most of the core ideas (e.g. the brain can grow, teachers can foster a growth mindset) presented in the mindset video were questioned to some extent.

The second broad theme we identified was *lack of individual differences*. In these statements, participants questioned the idea that everyone can grow and to what extent. We identified two sub-themes: (a) everyone, and (b) equality. Within the everyone sub-theme, participants showed their doubt that everyone could improve their mindset, for example: "[I find it hard to accept] that anyone is able to improve their mindset with hard work". Within the equality sub-theme, participants revealed hesitation with the idea that everyone could grow to the same extent through comments such as: "[I find it hard to accept] that every student can reach an equal level of success". It is important to note that the video never claimed that everyone could grow to the same extent or that intelligence is limitless. Thus, pre-service teachers questioned messages that were not actually presented in the video and that are indeed beyond the theory of a growth mindset.

The third broad theme we identified was *action behind the belief*, which questioned implementation of a growth mindset. The three sub-themes were: (a) ease, (b) student effort, and (c) teacher effort. Within the ease sub-theme, participants raised concerns about how easy the video made it seem to have a growth mindset or to help others hold a growth mindset: "[I find it hard to accept] how easy it is to adopt a growth mindset". Within the student effort sub-theme, participants doubted students would be willing to exert the necessary effort to sustain a growth mindset through comments such as: "[I find it hard to accept] because I feel that some people just don't have the desire to perform in school". Within the teacher effort sub-theme, participants expressed concern about the magnitude of the teachers' role for example, "[I find it hard to accept] that teachers are primarily responsible for getting kids to adopt a growth mindset". Overall, pre-service teachers questioned the amount of effort it took to implement a growth mindset and whether that was realistic for them or their students.

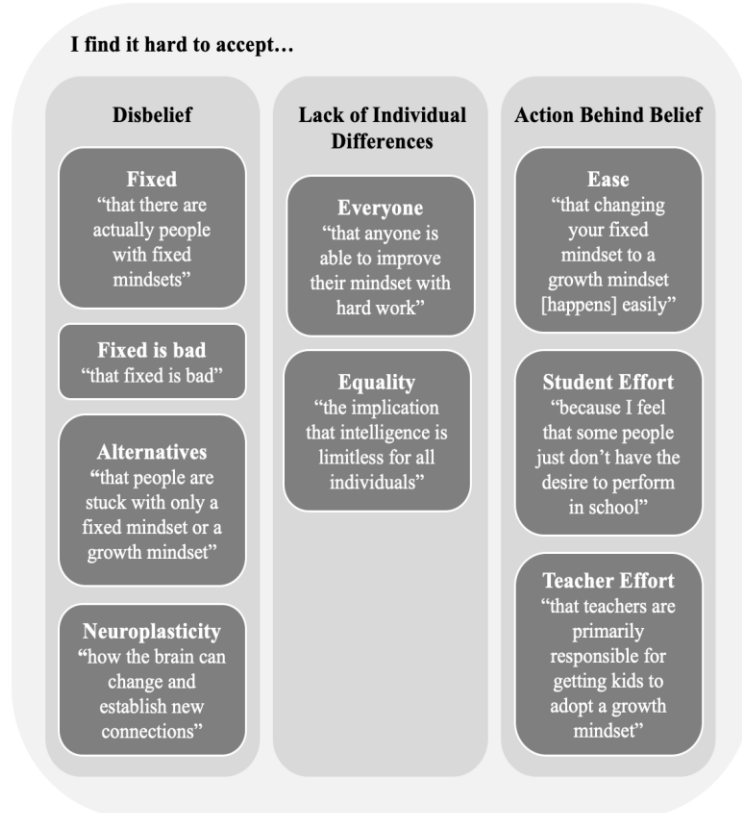


Figure 2: Results from the thematic analysis

Discussion

Our research sought to explore the tension between pre-service teachers' quantitative scores on mindset measures and elements of the theory that they find difficult to accept. The findings of the study suggest that pre-service teachers endorse growth beliefs quite strongly. However, despite high scores on the quantitative items, the thematic analysis found three themes that revealed important areas of resistance of a growth mindset in terms of ideas that were hard to accept. These themes included the notion of the mindset theory itself, lack of individual differences, and the necessary actions behind having a growth mindset. We focus this discussion on examining growth mindset scores and the discrepancies from our qualitative findings. Moreover, we discuss the limitations of our study, directions for future research, as well as implications for educators and researchers.

Growth Mindset Scores

Aligned with pre-existing research (Asbury et al., 2016; DeLuca et al., 2019; Guthsall, 2013, 2014), we found that pre-service teachers overwhelmingly endorsed growth beliefs statements when asked about their own general mindset regarding intelligence on a questionnaire. Additionally, their high scores are promising considering their choice of profession. It is important for teachers to believe that intelligence can be increased because they will spend much of their time teaching students new skills and abilities. Furthermore, teacher mindsets have been shown to relate to students' academic achievement, goal setting, and overall motivation in the classroom (Schmidt et al., 2015; Smith et al., 2018; Trouilloud et al., 2006) and thus the future students of these pre-service teachers may benefit from their current commitment to a growth mindset. However, the quantitative scores obscure some of the important hesitations or caveats that the pre-service teachers identified when asked to reflect on a mindset video. Future research should ask teachers what growth beliefs mean to them and how they apply their growth mindset in the classroom. This would help to better understand how teachers accept the concepts of the theory and whether their beliefs turn into practice—something that existing research on other motivation constructs suggests does not always happen (Daniels et al., 2017).

Evidence of False Growth Mindsets

In their open-ended reflection, pre-service teachers questioned several of the ideas that are foundational to mindset theory, despite having high quantitative scores. These places of resistance imply that pre-service teachers may be falling victim to a false growth mindset—that is they are willing to highly endorse the items even though still they have several questions or doubts about the theory, its constructs, and its enactment.

Most teachers go into the profession to help students grow and learn; however, some questioned why having a fixed mindset is bad. The idea of some pre-service teachers not understanding the issue with having a fixed mindset is problematic since research has clearly stated the negative impact of having a fixed mindset, such as lower self-efficacy and poorer academic achievement (Dweck, 2006). Future researchers may want to investigate why some pre-teachers have such beliefs despite selecting the profession. One possibility is that teachers are thinking about students who have fixed mindsets that are corroborated by high ability. For these students, a fixed mindset may not be problematic until they face a substantial challenge (Hwang et al., 2019).

One of the particularly surprising places of resistance was regarding the science of neuroplasticity underscoring claims that the brain can grow (i.e., “how the brain can change and establish new connections”). If individuals learning about mindsets do not accept that the brain itself is malleable, it may be hard for them to believe that abilities can improve. The evidence supporting neuroplasticity is robust and longstanding (Kania et al., 2017); thus, it does not warrant skepticism. In line with Daniels et al.'s (2020a) findings related to different types of evidence being convincing to teachers, it is worth considering that not all teachers value evidence being relayed in an experimental form. Some teachers respond more favourably to qualitative data, such as teacher-generated suggestions and discussions. Therefore, it may be beneficial for pre-service teachers to be presented with evidence of neuroplasticity in multiple forms in their teacher education programs in order to increase the likelihood of the understanding and accepting the theory's concepts.

In contrast to their numerical scores that rated growth beliefs for students, participants admitted to questioning the idea that *everyone* can improve their abilities. Some pre-service teachers overgeneralized the mindset message to suggest that it does not take into account the complexity of individual students. Furthermore, some participants also

found it challenging to understand how easy it seemed to “just think abilities can improve.” These reservations are important findings because the video did not state that everyone could grow to the same extent or that it was an easy process. Instead, the video explained how appropriate goals should be set for each student and that growth is relative to the individual and may look different for each person. This may be explained by the oversimplified surge in online figures and posters. Having a growth mindset requires the need to develop strategies and skills to grow; however, the belief that mindsets are “easy” may lead to a false growth mindset. One option for future interventions is to explain what a growth mindset is and to also explain what it is not. Addressing these misunderstandings when educating teachers about mindsets may help them parse out these differences.

Complementing the idea that “just believing” was too simplistic, some participants found it hard to believe that the actions supporting a growth mindset could be so simple. They felt that although the message spoke of simplicity it seemed to put a lot of responsibility on teachers – responsibility that teachers may not want. This aligns with prior research showing that both pre-service teachers and in-service teachers report low responsibility for their students’ motivation (Daniels et al., 2017, 2018). Teachers may not feel that they need to be the driving force of mindsets in their classroom, as the video suggests. Future researchers may want to consider asking teachers what type of support and intervention they might need in order to realistically and fully embed mindsets into their workload since this is a current point of resistance.

Overall, the qualitative findings align with what has been called a false growth mindset (Dweck & Yeager, 2019). The concerns with the theory as identified by pre-service teachers conflicts with their high scores and can be taken as evidence of false, or at least inflated, growth mindset scores. Since we uncovered differences in the quantitative and qualitative responses, we would recommend researchers consider conducting mixed methods research (Creswell, 2014) to tease out pre-service teachers’ true beliefs from their self-report scores. In particular, applying mixed methods to bring new validity perspectives to Dweck’s (1999) self-report tool with teachers could be beneficial (Zhou, 2019). Further, we encourage researchers to explore teachers’ actions associated with their growth mindset beliefs. It would be beneficial to provide teachers with resources that include actionable items on how to implement a growth mindset to support and grow the abilities of their students in the classroom.

Limitations and Future Directions

Although our findings provide important insight into pre-service teachers’ understanding of a growth mindset and the tension between quantitative mindset scores and qualitative mindset comments, it is important to consider the following three limitations. First, participants in this study came from a convenience sample of pre-service teachers from a large university in western Canada. Therefore, the results may not generalize to other academic institutions and programs. Additionally, our sample came from students in the second year of their teaching program who cannot fully speak to the practice of teaching. Nonetheless, it is still important to consider that pre-service teachers are endorsing growth beliefs and they are likely to keep this mindset moving forward into their practice. To remedy this limitation future research should consider a broader sample of students and institutions, as well as in-service teachers to speak fully to the practice of teaching.

Second, open-ended written questions have been argued to lack depth in qualitative research (Creswell, 2014). Although the open-ended question provided us with consistent answers between participants, it likely did not fully capture the perspectives of the participants. Moving forward, researchers could incorporate structured methods such as one-on-one interviews or diary studies in order to obtain a more fulsome understanding of pre-service teachers’ perspectives on mindset messages. In particular, it would be interesting to further probe pre-service teachers about the reasons why they find certain parts of the message hard to accept.

Finally, our participants were asked to watch a 16-minute mindset video which may have been too long to keep their full attention as research shows that after 6 minutes, engagement while watching videos for training drops rapidly (Guo et al., 2014). Further, although they were asked to respond to whether they had watched the video or not, we did not verify any further. Participants could have easily answered “yes” to the question and relied on their previous knowledge of mindsets, which may have been the reason for some of their misunderstanding of mindsets. Thus, future researchers may wish to produce a shorter video and incorporate a comprehension check.

Implications

The results of this study have implications for mindset theory (Dweck, 1999) and teacher training in relation to mindsets. Moving forward, it may be important to reconsider how the theory is presented to pre-service and practicing teachers. For example, it may not be necessary to continue emphasizing a growth mindset to teachers because results are consistently showing growth regardless of gender, teaching level, or disability (Asbury et al., 2016; DeLuca et al., 2019; Guthsall, 2013, 2014). Instead, the theory may want to present a more nuanced and contextual picture of growth to teachers that includes ups and downs, setbacks, and teachable moments. Pre-service teachers may benefit from learning specific tools and approaches to accurately communicate the theory to students. For example, Lou et al. (2017) have explored a new concept to the theory of mindsets called a decremental mindset, which posits that mindsets can be reduced. This notion may make sense to teachers who see students grow and atrophy in their learning on a regular basis. Introducing a notion like a decremental perspective to mindset messages may help teachers who understand a growth mindset to face the realities of not letting students' skills atrophy. This type of research would particularly benefit from mixed method designs (Creswell, 2014) when looking at mindsets.

Conclusion

To conclude, the results of this study provide valuable information respective to understanding pre-service teachers' mindsets. This study further confirms Dweck's (2016b) emphasis that mindsets are complex and do not simply entail thinking positively, as it has been publicized by the media. Although our quantitative data showed that it is easy to endorse a growth mindset, our qualitative data highlights hesitancy around mindsets from pre-service teachers and further investigation is required. Next steps include finding ways in which researchers can provide tools and resources to teachers so that they can successfully adopt a growth mindset and fully implement it in their classrooms. If beliefs are supported with the right strategies, mindsets could hold positive value for teacher and student motivation and success.

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