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Original Paper

The Impact of Growth Mindset on K-12 Students' Academic Performance in Australia

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Abstract

Students' performance in academic courses highlights the curriculum's development of knowledge and abilities, which is a crucial sign of academic success. The goal of the study is to determine how growth mindset affects students' academic performance in terms of engagement, skill development, information acquisition, and resilience. The purpose of this study is to emphasize the influence on Australian primary and secondary school students (K-12) aged 5-18 years, given the significance of this growth mindset on academic performance. In this study, the content analysis technique is used from 10 different studies and it is identified that there was no discernible growth mindset mediating effect in the relationship between reading achievement and formative assessment approaches. This study makes two different literary contributions. First of all, it links two related study streams: attitude and formative evaluation. This study has demonstrated that the connection between these two strands might lead to enhanced synergy between exterior educational approaches and internal psychological processes.

Keywords

growth mindset, the impact, K-12 students' academic performance

1. Introduction

The key focus of students, educators and policymakers is directed towards academic success. NSW (2023) elaborated that K-12 students are those who are enrolled in kindergarten (K) to 12th grade aged 5-18 years and enrolled in pre-primary, primary and secondary school grades. In Australia, approximately 4,086,998 pupils are enrolled in 9,629 schools (NSW, 2023). Australia has national training and education goals for improving educational performance of K-12 students where growth mindset has gained significance in Australia. Educational experts worldwide have focused on the

growth mindset and it is presumed that this strategy could boost exam scores of K-12 students' academic performance in Australia.

1.1 Background and Context

A growth mindset is about beliefs that a person's abilities can be improved through learning, persistence and efforts whilst fixed mindset considers that intelligence is innate. Dweck (2006) has emphasized that a person's mindset includes their beliefs about their abilities, limitations, opportunities, and intellect which shape thoughts and actions. Due to its potential to improve student motivation and performance, education researchers have recently focused on the growth mindset. Also, Dweck (2006) has proposed a "growth mindset," which signifies that people's talents may be improved by work and practice which contribute to their academic resilience and performance. This is contrary to fixed mindset which is about beliefs that abilities and intelligence cannot be changed through learning.

K-12 students is a term used in education which refers to students enrolled in Kindergarten (K) through 12th grade. In Australia, the education system of K12 encompasses through primary, secondary and tertiary education including 6 years of primary education, 4 years of junior high schools and 2 years of senior high schools. In Australia, the primary schools enroll students with age group of 5-11 years, secondary and high schools enroll students of 12-18 years of age (Australian Education Info, 2024). These students start their education journey at early ages, hence it is important to develop growth mindset.

Academic outcome is not merely related to good grades but it is extended to students' engagement in learning activities, development of critical thinking, analytical problem-solving and acquisition of knowledge. Students' achievement in academic subjects underline knowledge and skills development in curriculum which is a key indicator of academic success. Bloom et al. (1956) describes knowledge acquisition from memorizing to analysis and evaluation. In relation to academic outcomes, student engagement also holds significance as Martin (2007) has emphasized that students who participate in class discussions, raise their hands when asked questions, and turn in their work indicate they care about their studies. Engaged students are more likely to understand and remember knowledge, hence engagement predicts academic success (Martin, 2007). Furthermore, Costa and Kallick (2000) emphasize on problem solving and critical thinking skills to encourage students to learn independently and solve difficulties.

Students' participation in extracurricular activities such as academic competitions, debate groups, and scientific fairs help kids develop leadership, collaboration, and curiosity. Eccles and Barber (1999) say extracurricular activities can augment classroom learning and improve well-rounded education. Resilience, learning from mistakes, and perseverance are crucial to academic achievement. In academics, "grit," created by Duckworth et al. (2007) to describe a person's passion and ability to persevere, has become a key indication of success. Hence, the academic performance is related to students' engagement, development of critical thinking, problem solving and their participation in extracurricular studies.

Mohamoud (2024) has highlighted that growth mindset interventions motivate students as it increases self-confidence, intrinsic drive, and academic success. Furthermore, Johnson et al. (2021) supported that growth mindset interventions improved students' self-efficacy views and motivated them to complete tough tasks. Becken (2020) has underlined that growth mindset becomes challenging among K-12 students due to lack of self-efficacy. The study highlighted that growth mindset strategies improves self-belief and lead to high success rate in academic performances.

1.2 Research Aim

The study seeks to understand the impact of growth mindset on academic outcomes in relation to engagement, skill development, contributes to knowledge and resilience among students. Considering the importance of this growth mindset on educational outcomes, this study's aim is to highlight the impact on Australian primary and secondary school students (K-12) aged 5-18 years. Thus, contributing to understanding and comprehension of how growth mindset supports student success in Australia.

1.3 Research Question

What is the impact of growth mindset on K-12 students' academic outcomes in Australia?

1.4 Rationale

The rationale of study is to understand the intricate relationship of growth mindset among K-12 students with academic outcomes. In order to direct educational practice, it is vital to understand this connection for attainment of academic achievement. Teachers can better assist their students' academic and personal development by understanding how a growth mindset affects student performance. There is a lack of quantitative data to support the association between growth mindset and academic achievement. Extensive literature is available to signify this relationship there are varying results and there is a need of extensive research which elaborate on Australian context (Rhew et al., 2018). Considering the limitations of subject in Australian context, this study seeks to bridge this literature gap. Further, most studies have only looked at one age group or one subject area; hence, more study covering the whole K-12 spectrum is needed to fully understand the effects of growth mindsets. To address these knowledge gaps, the present study analyzed the correlation between a growth mindset and academic performance in Australian K-12 students quantitatively.

2. Literature Review

The section reviews available literature on growth mindset and impacts on academic outcomes.

2.1 Growth Mindset

The study of Dweck (2006) is important to understand the growth mindset which is a belief that abilities and intelligence are developed through continuous hard work and education. This contradict with fixed mindset which understands that character is natural and unchangeable. The study of Dweck (2006) has significance in the field of education for emphasizing on growth mindset. The role of growth mindset has been appraised by other researchers as Duckworth (2016) have emphasized on grit which is a will to succeed in the face of adversity which is closely connected with Dweck (2006) idea.

Students' fixed d mindsets and low self-efficacy negatively affect their academic achievement. Students with a fixed mindset think they lack intelligence and will never succeed. When starting new tasks, kids with a fixed perspective may see hurdles as roadblocks to achievement. Lack of activity perseverance may impair academic progress and development. Busch (2018) found that children who were commended for their effort were more willing to pursue learning activities than those that made them look smart. Intelligent youngsters cared more about how others performed than themselves. Dweck (2014) also suggests that teachers highlight students' strategies, concentration, persistence, and progress. This technique makes kids strong and capable. By changing how teachers communicate and give feedback, they can help students to develop a critical growth mindset.

Duckworth (2016) contended that perseverance and passion, particularly in demanding fields like education, are crucial factors in determining long term success. Grit is about the commitment to long-term focus and the strength to achieve them. Thus, grit and happiness were linked. It all boils down to doing what makes one happy to succeed in life. If you like learning, travelling, trying new things, being open to new ideas, and being diversified, follow your passion. Growth attitude and grit affect one's ability to overcome obstacles and achieve goals. Park et al. (2020) have polled 1667 students and professors four times over two years to assess grit and development mindset. Grit with growth mindset are predicted in rank-order and interpreted to be mutually related. These findings suggest that grit and growth mindset operate together during adolescence.

Furthermore, social-psychological treatments have been investigated by Yeager and Walton (2011). This study examined the theory behind well-known social-psychological interventions, showing how they target students' subjective school experiences, use persuasive methods to convey psychological ideas, and tap into educational environments' recursive processes, which cause lasting effects. Authors favored socio-psychological interventions as a means to encourage a growth attitude and enhance academic performance. In their view, creating a conducive classroom climate requires attending to students' values and worldviews which addresses student’s beliefs and attitudes.

2.2 Self-Efficacy and Self-belief

Bandura (1986) has escribed self-efficacy as confidence in one's ability to succeed in given settings. Bandura (1997) further extended that self-efficacy attitudes affected how much people believed in their skills to achieve their goals and how much work they were willing to put in. Setbacks can demoralize confident person. Students' secondary and college performance was heavily influenced by their academic self-confidence (Rhew et al., 2018). According to Zimmerman (2000), students who believe in their educational success are more willing to try new things, persist with it when things don't work, and handle failures confidently. Academic achievement depended on students' self-confidence in their learning and test-taking ability (Pajares & Schunk, 2001). Self-efficacy affects emotions, attitudes, and behaviours (Schwarzer, 2014). Poor self-efficacy caused anxiety, despair, and powerlessness. Klassen et al. (2008) found that students who lacked confidence pushed off their assignments till the last minute and had worse GPAs. Dweck and Master (2009) found that students with a growth mindset were more

confident in themselves. Growth-minded students were also more engaged, persistent, and willing to go the extra mile (Urdan & Turner, 2005). Dweck and Master (2009) found that students with a growth mindset were more likely to believe in themselves and persevere through tough activities, leading to academic success.

2.3 Impact on Academic Outcomes

The literature suggests that growth mindset improves students' motivation, resilience, and learning strategies, which boosts academic success. Blackwell et al. (2007) found that development-minded pupils performed better in maths. Smith (2023) found in meta-analysis that growth mindset interventions helped students of all ages and in all courses. Growth mindset interventions improved students' classroom resilience (Macnamara & Burgoyne, 2022). Instead of seeing failures as mistakes, these pupils saw them as opportunities to improve. Reeve and Tseng (2011) found that growth mindset therapies help children think positively and resiliently, making them more academically resilient. Mohamoud (2024) found that students whose efforts were recognized were more likely to persevere in difficult work than those whose intelligence was recognized, with the former encouraging growth and the latter a fixed perspective. A growth attitude made students more willing to try new things and more resilient when their first attempts to solve problems failed, according to Claro et al. (2016). Burnette et al. (2013) found that growth-minded students thought critically. This includes asking questions, investigating, and comparing opinions. Growth mindset interventions also enhanced students' critical thinking skills on standardized tests (Yeager et al., 2019).

Students' academic outcomes are enhanced with growth mindset interventions. Furthermore, Sisk et al. (2018) study has revealed weak but significant positive relationship between growth mindset and academic achievement across various educational levels and subject areas. Thus, the literature supported that growth mindset improves academic outcomes of students in relation to engagement, motivation, skill development, resilience and learning.

2.4 K-12 Students Growth Mindset

Using mindset theory in the classroom can help students take responsibility of their learning and reach their academic potential. A growth mindset encourages kids to take ownership of their learning and develops modern-era learning habits. Finding context-specific aspects to impart mindset signals to students is key to cultivating a growth mindset role in classroom. Yu et al. (2022) examined how teachers' self-efficacy, mentality, pedagogy, and school culture affect students' development mindset. The OECD Survey including 2200 Finnish elementary school students aged 10, 358 educators, and 65 school administrators was used. Multilevel studies showed that students' growth mindset was stronger in schools that prioritized social-emotional development and in guided inquiry classrooms. However, students supported a fixed attitude more when teachers differentiated tasks by ability. Integration of teaching practices to support students' growth mentality is important for building self-belief and development. Jorif and Burleigh (2020) study seeks to highlight perspectives of 9-12th grade teachers about growth mindset and how they plan to implement it into their lessons. The analysis found four

main points including incorporation of growth mindset practices for daily classroom instruction, improving students learning through experiences of academic success and failure, and using growth mindset learning tasks and communicating verbal affirmations.

There is limited research available on K-12 students' growth mindset in Australian context. Boylan et al. (2018) examined how a growth mindset promotes children's learning agency from an early childhood educator's perspective. This article presents findings from a study on elementary school educators' growth mindset promotion views. About 95 kindergarten through second grade teachers in Western Australia were surveyed about development mentality. Results show educators' views and attitude implementation are inconsistent. Information shared by educators affects high-quality early childhood education. Furthermore, Buchanan and Kern (2017) examined the impact of growth mindset interventions on Australian primary school students' literacy and numeracy outcomes and found positive effects. Yet, the study was limited in scope and did not provide a comprehensive analysis of the relationship between growth mindset and academic performance across the K-12 spectrum.

The existing literature review highlighted that there is a gap and need for further research is needed to clarify the link between growth mindset and academic performance within the Australian educational setting. The study of Boylan et al. (2018) has focused on teachers' perspectives and Buchanan and Kern (2017) study has limited scope. Hence, there is need to focus on students' growth mindset in K-12 standards and how this intervention contribute to academic excellence of students.

3. Methodology

This study has used quantitative content analysis (QCA) consistent with a positivist philosophy. Positivism emphasizes on measurement and reason and underlines that knowledge can be gained through quantifiable observations (Park et al., 2020). QCA seeks reliability and objectivity through rigorous and regulated methods (Devi Parsad, 2019). It involves classifications, coding methods, and presenting findings with evidences to ensure uniformity. Quality content analysis (QCA) finds patterns in large datasets. Although it cannot show a causal relationship, it might suggest probable links for future trials. This supports positivist goals of avoiding researcher bias and reproducing study results.

3.1 Key steps of QCA

Quantitative content analysis is similar to quantitative research but it has some distinctive unique properties, such as its coding system and reliability evaluation processes.

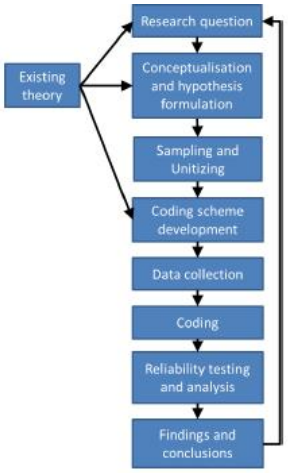

Figure 1. Key Steps of Quantitative Content Qnalysis (QCA)

This study has followed the key steps of QCA (see Figure 1) where research question seeks to highlight what is the impact of growth mindset on K-12 students' academic performance in Australia?

Considering the research question, the literature has supported the conceptualization that growth mindset is important for students' academic performance. It has been assessed that there is limited literature available on K-12 Australian students and their academic performances, hence this study focused on K-12 (5-18 years old) students. In relation to literature support, it has been conceptualized that the growth mindset improves students' motivation, resilience, problem solving, critical thinking and educational learning, hence increasing overall academic performances. Based on this, the study has hypothesized that:

K-12 students of Australia with a growing mindset likely to have overall academic success in relation to motivation, resilience, problem solving, critical thinking and educational learning.

3.2 Screening

By focusing on research question, this study has screened 10 documents including keywords growth mindset, academic outcomes in relation to grades, motivation, resilience, problem solving, critical thinking and academic learning. The inclusion criteria of documents include publishing date (2015-2024), keywords ("growth mindset", "teacher's role", "academic success", "Academic motivation", "academic resilience", "problem solving and critical thinking", "role of assessments") and published in Australia or discussing Australian region's K-12 education (Liu et al., 2006). For better accuracy and relevancy, the boolean operators (And, Or and Not) were used for refining search. Hence, the screening process has focused on following criteria.

- Keywords relevance
  - Growth mindset, mindset
  - K-12 students

- Academic outcomes (“assessments”, “academic motivation”, “problem solving and critical thinking “and academic learning”)
- Resilience
- Teachers roles, interventions and trainings

- Publishing date (2015-2024)
- Focusing on Australian K-12 students

Initially, 10 documents are screened which were further reduced to 5 studies based on frequency analysis and sample checks. This screening was based on frequency analysis and only those 5 studies were included in which these keywords occurred more frequently. It has been assessed through frequency analysis that teacher’s support and assessments occurred more frequently. Also, the sample checks were used where these documents were analyzed manually by reading title, abstract and relevant keywords which. Through analysis, themes have been constructed where similar findings and patterns were merged. The frequency of key terms across the analyzed documents is presented in Table C3 in the Appendix. At the end, 5 studies are selected as final because they were fulfilling the criteria of keywords.

The rationale for choosing these keywords was to highlight the impact of growth mindset on academic outcomes of K-12 students. For emphasizing on academic outcomes, the role of teachers’ roles and assessments were used.

3.2.1 Sampling

For addressing the research question, this study has relied on 10 documents selected from Australian school or government documents related to students' growth mindset and academic performance. For this, purposive sampling method is used which involves selecting documents which are relevant to research questions (Campbell et al., 2020). A summary of the key studies analyzed and their findings is provided in Table A1 in the Appendix.

3.3 Coding

Once the documents were collected, they were coded based on the concepts and characteristics of “growth mindset”and “academic outcomes” to ensure comprehensiveness as possible. To interpret academic outcomes, students’ learning experiences was coded which include keywords such as “academic motivation”, “problem solving and critical thinking”. Teacher support and assessments occurred most frequently, hence these are coded as teacher support and assessments. Furthermore, resilience is coded due to its occurrences in all 5 documents. Also, students’ learning outcomes was coded in relation to trainings and scores in assessments. The full coding scheme with associated keywords used for the content analysis is presented in Table 1.

Table 1. Coding Scheme and Keywords

Codes	Keywords
Growth mindset	Growth mindset, Self-efficacy, Mindset
Student learning experiences	• Academic motivation)
	• Problem solving and critical thinking
	• Personalized learning
Students' learning outcomes	• Scores and grades
	• Scores
Resilience	• Development
	• Mindfulness
Teacher support	• Teacher assistance
	• Trainings and interventions
Assessments	• Formative
	• Summative
	• Tests and class discussions

3.4 Reliability

The reliability of study is maintained through clearly defined keywords, codes and following inclusion criteria. For reliability, the codes are documented and based on keywords, themes have been made which are presented in results section (Krippendorff, 2004).

3.5 Ethical Consideration

Ethical considerations were given priority for selecting documents that were publicly available. The quantitative content analysis is used to address research question (Pietila et al., 2020). For privacy and confidentiality, the results are saved in password protected laptop which can only be accessed through authorized persons. Also, the research has interpreted documents subjectively which is prone to subjective bias. For ensuring ethical implications, the references and citations are presented with themes to highlight the reliability of study. Through this, the plagiarism is avoided and academic integrity is ensured. Furthermore, this study has focused on following university's ethical guidelines and ensured that research is ethical and follow academic integrity.

This methodology has ensured that literature gap is bridged by focusing on inclusion criteria where data was collected from only reliable sources published by government and other important institutions.

4. Findings and Discussion

4.1 Introduction

In this chapter, the content analysis is used to analyse the secondary data collected and also content analysis is used by extracting key themes from the selected studies based on the keywords identified

from those studies. The following themes are generated. A thematic analysis of the key concepts identified across the studies is presented in Table B2 in the Appendix.

4.1.1 Connection between Teacher Support and Student's Achievement Considering Growth Mindset

The findings support the notion that positive teacher-student interactions might support students' successful learning. These study findings are consistent with those of other researchers and imply that improved teacher-student interactions lead to improved student learning outcomes. It's important to note that no statistically significant variations in gender, grade, or student socioeconomic position were found when evaluating the teacher support variable. According to the statistics, schools under examination are establishing a supportive learning environment where opportunities are created for students to become involved in the learning process and have higher learning results. Even though studies have shown how important teacher-student connections are to students' academic success, researchers are still trying to figure out whether internal or external elements play a role in this interaction (Mesler et al., 2021). One of the underlying presumptions is that a student's growth mindset can play a major role in the relationship that exists between the teacher's support (a relationship that is comprised of relationships) and the student's achievement in Australia. Specifically, a student with a growth mindset will likely put in more effort in the classroom and actively seek out assistance from their teacher, which will help them deal with obstacles and challenges more easily. The results of the analysis indicated that when students have a growth mindset, there is a larger positive correlation between their achievement and the support of their teachers. This implies that a student's belief in his or her own ability to grow enhances the significance of the teacher's support for the student's success. Students in Australia who has a robust growth mentality are focused to use their teachers' help more quickly as compared to other students (Zhang & Koshmanova, 2021). Learning accomplishment hurdles may arise in the absence of both growth mindset learning assignments and vocal affirmation in the lesson.

4.1.2 Role of Education in Growth Mindset among k-12 Students

The level of education attained is a significant indicator of a person's likelihood of employment, income, and wellbeing in the future. Compared to their peers who drop out of school, young people who complete Year 12 are more likely to be employed as adults and are less likely to be dependent on benefits. In the globalized 21st century, with its abundance of technology, education has even greater significance. An increasing number of low-skilled jobs are being mechanized, while the need for some higher-level talents is rising. These days, abilities in math, science, technology, and engineering are required for 75% of the fastest-growing jobs (Claro & Loeb, 2019). The population's skills have a significant impact on a country's GDP, rate of economic growth, capacity for innovation, and social advancement. There would be substantial economic benefits from even a little increase in young Australians' educational attainment. As more highly competent school dropouts enter the workforce, the effect will increase over time. In Australia, educational disadvantage starts early, lasts through school, and persists into post-school transitions. In their first year of school, one in three (32.6%) children from

the most disadvantaged communities in Australia fail to fulfill one or more important developmental milestones. In contrast, 15.5% of kids from the wealthiest neighborhoods fall into this category. Of young individuals from the lowest socioeconomic origins, only 58.9% are fully involved in school, training, or employment by the age of 24 (Claro & Loeb, 2019). In comparison, 83.1% of people with the greatest socioeconomic status fall into this category (Claro & Loeb, 2019). Young individuals who have poor post-school transitions are far more likely to experience unfavorable long-term social and economic results, such as welfare dependency and poverty.

A wide range of intricate personal, family, institutional, community, and societal elements that affect young people's outcomes must be considered in any attempt to improve Australia's educational performance. These include the abilities, knowledge, and learning attitudes of young people; the involvement of parents in their children's education; the caliber of instruction received by young people; school culture; and the networks and resources available to young people and their families in their community (Zintz, 2018). The educational outcomes of underprivileged children and young adults will not improve significantly or sustainably in the short term due to the variety of factors that influence them. Nonetheless, considerable advancements could be achievable. Research by James Heckman, the Nobel laureate in economics, emphasizes the essential broad ideas. The best and most economical approach to enhance the wellness and educational achievements of underprivileged kids is to offer them focused assistance from an early age and sustain it over the course of their first 20 years of life in a well-rounded manner (Lamb, 2022). This strategy is more successful as compared to focusing support on a specific stage of young people's lives, like preschool or adolescence, for the same accumulated cost. This strategy declines dependence on poverty in Australia and the number of convictions of crime, while raising graduation of high school and enrollment of university.

4.1.3 Growth Mindset on a Student’s Educational Experience

Education professionals have worked hard over the years to enhance student learning outcomes and close the achievement gap in the classroom. The idea that a student's mentality has a substantial impact on their motivation, self-efficacy, perseverance, and growth over time is supported by research and studies included in this study. This could help schools close the achievement gap amongst pupils. The problem of a fixed mindset in education, however, still plagues schools today since growth mindset training and treatments have not been proven to produce outcomes that last (Zintz, 2018). The investigations and interventions carried out throughout the research employed varying percentages of diversity and sample sizes of the student population; yet, the studies consistently had a favorable impact on the learning experiences of the students. This implies that all students possess the capacity to succeed if they are provided with an appropriate learning environment. This is important information for educators to know because studies have also shown that friends, parents, and instructors all significantly influence the self-perceptions that children may have (Victoria University, 2020). For a change in perspective to benefit kids, teachers must first embrace these same ideas and recognize the potential that lies within each and every one of them (Miller & Srougi, 2021).

Adding further curricula and activities to the initial interventions and trainings that support growth mindsets in the classroom would be extremely beneficial for districts and educators (Becken, 2020). When educators start creating opportunities for future thinkers and dreamers to develop in their classrooms, it becomes easier to deliver high-quality learning experiences for their students and instruction. Engaging in real-world applications, presenting real-world challenges to students and letting them research, formulate theories, and learn from their errors to refine and enhance their solutions are examples of high-quality learning experiences (Miller & Srougi, 2021). Students who embrace making errors and see failure as an opportunity to learn and develop gain personal qualities that increase their chances of success both inside and outside of the classroom throughout their lives. The greater the possibilities provided for children to overcome obstacles and develop resilience, the more likely it is that they will succeed in the long run. Increasing the number of STEM (science, technology, engineering, and math) activities offered in schools and establishing maker spaces or design areas are excellent strategies for giving children the freedom to think outside the box and learn from mistakes. All kids should be given this chance to develop their grit, work toward perseverance in the face of setbacks, and chart a course for success in a society that values growth. Additionally, in order to provide students with positive next steps for growth and to foster growth-minded thinking, instructors need to continue their professional development (Li & Bates, 2019). The literature makes repeated recommendations for staff workshops as a means of encouraging and offering chances for introspection as well as enabling educators to change their own mental models. In order to develop and learn from one another, the majority of educators already collaborate and share techniques and best practices, but research indicates that there is a rising demand for more chances (The Smith Family Research Report, 2016). According to studies, the identical activity can be carried out with an emphasis on incorporating language that encourages growth-minded thinking and feedback techniques. These kinds of trainings will make instructors more aware of their surroundings and enable them to think more carefully and reflectively about their own methods (Li & Bates, 2019).

4.1.4 Relationship between Formative Assessment and Growth Mindset

All formative evaluation techniques were positively and strongly correlated with growth mindset in Australia, according to the correlational study. The findings indicated that only in Australia were students who reported getting more practices of formative assessment have more chances to have an attitude of growth. Two formative evaluation techniques that were shown to be positively and weakly linked with growth mindset in the East were sharing learning progressions and giving feedback (Li & Bates, 2019). Every relationship was weak and not statistically significant in the West. The assessment that formative evaluation fosters in pupils a growth mentality is somewhat supported by these findings, however the evidence is poor and limited in the Eastern samples. It is hypothesized that the method PISA 2018 evaluated these constructs may have understated the relationship between formative assessment techniques and growth mindset. One item was employed to assess growth mindset; it would have been preferable to utilize many, more psychometrically robust items. However, the way PISA

created the questions made this impossible. Second, the PISA growth mindset assessment focused on generic development mindset rather than domain-specific growth mindset (Jorif & Burleigh, 2022). Nonetheless, questions on formative assessment particularly inquired about the methods used by teachers in language instruction. The connections may be weakened by the two conceptions' varying levels of specificity in assessment. Though research in this field is still in its infancy because previous studies have largely focused on general mindsets, recent studies have advocated the necessity to quantify language-specific growth mindsets (Boylan et al. 2018). The study is among the first to use a sizable cross-sectional sample to examine the links between formative assessment and growth mindset; hence, the results should be evaluated cautiously (Jorif & Burleigh, 2022). Future research might examine the use of growth mindset domain-specific instruments, longer multi-item surveys with higher psychometric validity, and more meticulous data gathering strategies to better assess the relationship between these two dimensions.

5. Conclusion

Australia must overcome formidable educational obstacles if it is to maintain its social cohesion and competitiveness in the global arena. In the first year of school, there are noticeable differences in pupils' academic outcomes according to their backgrounds. Due to these discrepancies, which widen as students' progress through school, a sizable percentage of young adults from underprivileged homes do not go on to pursue higher education or work. They run the danger of experiencing lifetime financial and social hardship as a result. The country has also suffered a great loss. With the same objective of enhancing kids' academic outcomes, the Learning for Life program has been effectively involving a sizable number of severely underprivileged young Australians and their families for an extended period of time. The study's conclusions provide light on the connections between particular formative assessment techniques, a development mindset, and reading proficiency. Formative evaluation techniques were generally only favorably correlated with a growth mindset in the East, not the West. Out of the three formative assessment methodologies, instructional modifications had the most significant and favorable effect on reading achievement. In turn, reading achievement was favorably predicted in the West but not in the East by growth mentality. The connection between formative assessment methodologies and reading achievement did not exhibit a significant mediating influence from growth mindset. There are two distinct literary contributions made by this study. Firstly, it connects formative assessment and attitude, two linked study streams. As this study has shown, there is potential for increased synergy between internal psychological processes and external educational tactics due to the interaction between these two strands. More studies in this area may lead to a more nuanced understanding of the ways in which mindset and formative assessment influence student learning and how best to maximize those effects. Second, the study's findings regarding the cross-cultural erraticism in the relationship between specific strategies of formative assessment, growth mindset, and academic achievement emphasize the significance of taking context of culture into

consideration when explaining the results of huge scale global projects of assessments like PISA and forming formative assessment or programs of mindset intervention. Numerous growth mindset research investigations, which covered the ideas of creating academic drive, building resilience to academic advancement, and believing in intellectual capacity, corroborated the study's findings. But maintaining useful teaching resources that incorporate growth mindset ideas into classroom instruction continued to be a challenge. The purpose of this study was to learn secondary school teachers' opinions about how to continue teaching growth mindset concepts. The strategies in this article may help educators sustain concepts of growth mindset in the classroom: verbal assertions to students having growth mindset tasks of learning, experiences for successes and failures in academics, ongoing teacher support, and professional development. These strategies also offer answers to the research questions.

References

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: W.H. Freeman.

Bandura, A., 1986. Social foundations of thought and action. *Englewood Cliffs, NJ*, *1986*(23-28), 2.

Becken, D., 2020. *Effects of Growth Mindset on a Student's Educational Experience*.

Blackwell, L. S., Trzesniewski, K. H., & Dweck, C. S. (20070. Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child development*, *78*(1), 246-263.

Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, W. H., & Krathwohl, D.R., 1956. *Taxonomy of educational objectives: The classification of educational goals. Handbook 1: Cognitive domain* (pp. 1103-1133). New York: Longman.

Boylan, F., Barblett, L. and Knaus, M., 2018. Early childhood teachers' perspectives of growth mindset: Developing agency in children. *Australasian Journal of Early Childhood*, *43*(3), 16-24.

Brandisauskiene, A., Buksnyte-Marmiene, L., Cesnaviciene, J., Daugirdiene, A., Kemeryte-Ivanauskiene, E., & Nedzinskaite-Maciuniene, R. (2021). Connection between teacher support and student's achievement: could growth mindset Be the moderator?. *Sustainability*, *13*(24), 13632.

Brown, A., Smith, J., & Jones, S. (2023). *The impact of a growth mindset intervention*.

Buchanan, A., & Kern, M. L. (2017). *The benefit mindset: The be.*

Buchanan, R. (2020). Through growth to achievement: Examining edtech as a solution to Australia's declining educational achievement. *Policy Futures in Education*, *18*(8), 1026-1043.

Burnette, J. L., O'boyle, E. H., VanEpps, E. M., Pollack, J. M., & Finkel, E. J. (2013). Mind-sets matter: a meta-analytic review of implicit theories and self-regulation. *Psychological bulletin*, *139*(3), 655.

Busch, B. (2018). *Research every teacher should know: Growth mindset*. [online] the Guardian. Retrieved from

https://www.theguardian.com/teacher-network/2018/jan/04/research-every-teacher-should-know-growth-mindset

Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., & Walker, K. (2020). Purposive sampling: complex or simple? Research case examples. *Journal of research in Nursing*, *25*(8), 652-661.

Claro, S., & Loeb, S. (2019). Students with growth mindset learn more in school: Evidence from California's CORE school districts. *Educational Researcher*, 0013189X241242393.

Costa, A. L., & Kallick, B. (2000). Discovering and exploring habits of mind. *Explorations in Teacher Education*, *36*, 36-38.

Devi Prasad, B. (2019). Qualitative content analysis: Why is it still a path less taken?. In *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research* (Vol. 20, No. 3). DEU.

Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: perseverance and passion for long-term goals. *Journal of personality and social psychology*, *92*(6), 1087.

Dweck, C. S. (2006). *Mindset: The new psychology of success*. Random house.

Dweck, C. S. (2014, December). *The power of believing that you can improve*. Retrieved October 3, 2018, from https://www.ted.com/talks/carol_dweck_the_power_of_believing_that_you_can_improve

Dweck, C.S. and Master, A., 2009. Self-Th eories and Motivation: Students' Beliefs About Intelligence. In *Handbook of motivation at school* (pp. 137-154). Routledge.

Eccles, J. S., & Barber, B. L. (1999). Student council, volunteering, basketball, or marching band: What kind of extracurricular involvement matters?. *Journal of adolescent research*, *14*(1), 10-43.

Froedge, K. L. (2017). *The effect of a growth mindset on student achievement among students with a disability* (Doctoral dissertation, Western Kentucky University).

Jorif, M., & Burleigh, C. (2022). Secondary teachers' perspectives on sustaining growth mindset concepts in instruction. *Journal of Research in Innovative Teaching & Learning*, *15*(1), 23-40.

Klassen, R. M., Krawchuk, L. L., & Rajani, S. (2008). Academic procrastination of undergraduates: Low self-efficacy to self-regulate predicts higher levels of procrastination. *Contemporary educational psychology*, *33*(4), 915-931.

Krippendorff, K. (2004). Reliability in content analysis: Some common misconceptions and recommendations. *Human communication research*, *30*(3), 411-433.

Lamb. (2022). Retrieved from https://vuir.vu.edu.au/42362/1/educational-opportunity-in-australia-2020.pdf

Learning for Life Program: Creating Better Futures. (n.d.). *The Smith Family*. Retrieved from https://www.thesmithfamily.com.au/programs/learning-for-life#

Li, Y., & Bates, T. C. (20190. You can't change your basic ability, but you work at things, and that's how we get hard things done: Testing the role of growth mindset on response to setbacks,

educational attainment, and cognitive ability. *Journal of Experimental Psychology: General*, *148*(9), 1640.

Liu, F., Yu, C., Meng, W., & Chowdhury, A. (2006). June. Effective keyword search in relational databases. In *Proceedings of the 2006 ACM SIGMOD international conference on Management of data* (pp. 563-574).

Macnamara, B. N., & Burgoyne, A. P. (2022). Do growth mindset interventions impact students' academic achievement? A systematic review and meta-analysis with recommendations for best practices. *Psychological Bulletin*.

Martin, A. J. (2007). Examining a multidimensional model of student motivation and engagement using a construct validation approach. *British Journal of Educational Psychology*, *77*(2), 413-440.

Mesler, R. M., Corbin, C. M., & Martin, B. H. (2021). Teacher mindset is associated with development of students' growth mindset. *Journal of Applied Developmental Psychology*, *76*, 101299.

Miller, H. B., & Srougi, M. C. (2021). Growth mindset interventions improve academic performance but not mindset in biochemistry. *Biochemistry and Molecular Biology Education*, *49*(5), 748-757.

Mohamoud, A. M. (2024). The Impact of Growth Mindset Interventions on Students' Motivation, Resilience, and Academic Achievement. *Multidisciplinary Journal of Horseed International University (MJHIU)*, *2*(1), 102-125.

Nsw.gov.au. (2023). *K-12 Schools*. Retrieved from https://education.nsw.gov.au/about-us/efsg/design-components/k12-school-builds#:~:text=K%2D12%20schools%20are%20an,combined%20Primary%20and%20Secondary%20facility

Pajares, F., & Schunk, D. (2001). The development of academic self-efficacy. *Development of achievement motivation. United States*, *7*, 1-27.

Park, D., Tsukayama, E., Yu, A., & Duckworth, A. L. (2020). The development of grit and growth mindset during adolescence. *Journal of Experimental Child Psychology*, *198*, 104889.

Park, Y. S., Konge, L., & Artino Jr, A. R. (2020). The positivism paradigm of research. *Academic medicine*, *95*(5), 690-694.

Pietilä, A. M., Nurmi, S. M., Halkoaho, A., & Kyngäs, H. (2020). Qualitative research: Ethical considerations. *The application of content analysis in nursing science research*, 49-69.

Polirstok, S. (2017). Strategies to improve academic achievement in secondary school students: Perspectives on grit and mindset. *Sage Open*, *7*(4), 2158244017745111.

Reeve, J., & Tseng, C. M. (2011). Agency as a fourth aspect of students' engagement during learning activities. *Contemporary educational psychology*, *36*(4), 257-267.

Rhew, E., Piro, J. S., Goolkasian, P., & Cosentino, P. (2018). The effects of a growth mindset on self-efficacy and motivation. *Cogent Education*, *5*(1), 1492337.

Schwarzer, R. (2014). *Self-efficacy: Thought control of action*. Taylor & Francis.

Sisk, V. F., Burgoyne, A.P., Sun, J., Butler, J. L., & Macnamara, B. N. (2018). To what extent and under which circumstances are growth mind-sets important to academic achievement? Two meta-analyses. *Psychological science*, *29*(4), 549-571.

Smith, T. G. (2023). *The Impact of Teacher Grit and Growth Mindset on Teacher Self-Efficacy: A Phenomenological Approach* (Doctoral dissertation, Saint Peter's University).

Spero, C., & Hattrup, K. (2020). *The impact of mindset interventions on academic achievement*. Urdan, T., & Turner, J. C. (2005). Competence motivation in the classroom. *Handbook of competence and motivation*, *297317*.

Yan, Z., King, R. B., & Haw, J. Y. (2021). Formative assessment, growth mindset, and achievement: Examining their relations in the East and the West. *Assessment in Education: Principles, Policy & Practice*, *28*(5-6), 676-702.

Yeager, D. S., & Walton, G. M. (2011). Social-psychological interventions in education: They're not magic. *Review of educational Research*, *81*(2), 267-301.

Yu, J., Kreijkes, P., & Salmela-Aro, K. (2022). Students' growth mindset: Relation to teacher beliefs, teaching practices, and school climate. *Learning and Instruction*, *80*, 101616.

Zhang, W., & Koshmanova, T. (2021). Chinese Teachers build growth mindset to foster student achievement in the disadvantaged private secondary high schools. *Journal of Education and Human Development*, *10*(3), 7-19.

Zimmerman, B. J. (2000). Self-efficacy: An essential motive to learn. *Contemporary educational psychology*, *25*(1), 82-91.

Zintz, S. (2018). *Effectiveness of a growth mindset in education*.

Appendix

Table A1. Summary Table of Studies

Author and Year	Aim	Methodology	Findings
Victoria University, 2020	The report is based on the information from different sources on the chances being given to young Australians for mastering the skills required to be prepared well for the future.	Secondary data	The findings depict that the systems are working properly for different young Australians and skills and teaching required for adding properly to contemporary communities and workplaces.
The Smith Family Research	The study enhances the improvement of educational results of disadvantaged young Australian people.	Secondary Data	The study identified that the efforts are required to improve the educational performance of

Report, 2016			Australia required to consider a complicated range of family, personal, societal factors, and institutional community that impact the outcomes of young people.
Buchanan, 2020	The report provides different recommendations to assess decreasing achievement in the schooling of Australia.	Secondary data	Analysis shows that Australia can go through robust change and teaching will be rearranged as a procedure of continuous evaluation, procedures of personalized learning that will result to algorithmically based educative opportunities focused on previous achievements of the students and their choices and learners will be redeveloped by persuasion of technologies.
Boylan et al. 2018	This study assesses the role of early childhood teachers' ideas regarding mindset of growth in making agency among children.	Primary data through surveys	The analysis showed that competing knowledge regarding what teachers consider about mindset and their capability to apply it.
Becken, 2020	This research helps to gain an assessment of strategies of growth mindset and interventions by assessing accessible studies on the theme.	Secondary data	The study identified that the application of interventions of growth mindset promoted beliefs of growth mindset and can result to greater rates of success in overall results in academics.

Table B2. Thematic Analysis

Theme 1: Connection between teacher support and student's achievement considering growth mindset	**Theme 2: Role of education in growth mindset among k-12 students**	**Theme 3: Growth Mindset on a Student's Educational Experience**	**Theme 4: Relationship between formative assessment and growth mindset**
Student learning outcomes	Educational attainment	Mindset training and treatments	Formative evaluation techniques
Supportive learning environment	Intervention and training	Learning experiences	Generic development
Teacher support	Educational outcomes	High-quality learning experiences	Language-specific growth mindsets
Teacher assistance	Educational attainment	Develop resilience	General mindsets

Table C3. Frequency Table

Document Name	Words	Learning Experiences	Teacher Support	Develop Resilience	Student Learning Outcomes	Growth Mindset	Assessment
Learning For Life	3845	8	8	1	3	14	35
Educational opportunity in Australia 2020	8200	6	9	2	5	13	31
Through growth to achievement: Examining edtech as a solution to Australia's declining educational achievement	6100	7	10	2	4	14	24
Effects of Gr ects of Growth Mindset on a Student' owth Mindset on a Student's Educational Experience	4800	5	6	1	5	8	30

Early childhood teachers' perspectives of growth mindset: Developing agency in children	5246	6	9	1	4	6	14