Integrating Psychological Insights into Pre-Service Teacher Training: A Study on Curriculum Design and Its Impact on Learner Behaviours in Modern Classrooms

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Abstract

This scoping review investigates the integration of psychological insights into pre-service teacher training, focusing on curriculum design and its impact on learner behaviours in modern classrooms. The study analysed 348 publications, with a final synthesis of 67 peer-reviewed articles published in English between 2010 and 2024. The aim was to identify effective strategies for incorporating psychological principles into teacher education curricula to better prepare future educators for the diverse behavioural dynamics of contemporary classrooms (Mahaye & Ajani, 2023). The review highlights key themes such as the role of cognitive and behavioural psychology in curriculum development, the importance of understanding student motivations, and the effectiveness of various instructional strategies on student engagement and achievement. Findings suggest that integrating psychological insights into teacher training can significantly enhance pre-service teachers' ability to manage and positively influence learner behaviours. The study provides recommendations for curriculum improvements and suggests areas for further research, aiming to contribute to the development of more effective, psychologically informed teaching practices.

Keywords: Pre-Service Teacher, Teacher Education, Curriculum Design, Educational Psychology, Learner Behaviours, Modern Classrooms, Instructional Strategies

Research has highlighted several psychological theories that are particularly relevant for teacher training. For example, Vygotsky's socio-cultural theory emphasizes the role of social interaction in learning, suggesting that teachers should create collaborative learning environments (Vygotsky, 1978). Similarly, Bandura's social learning theory underscores the importance of modelling and observational learning, which can be integrated into teaching practices to enhance student engagement and behaviour (Bandura, 1986). These theories provide a framework for developing curricula that address both the academic and psychological needs of students.

A critical aspect of integrating psychology into teacher education is the focus on learner behaviours. Understanding the factors that influence student behaviour, including motivation, self-regulation, and social-emotional development, is essential for teachers to foster a positive classroom climate (Pintrich, 2000). Research indicates that when teachers are equipped with strategies to support these aspects, they are more effective in promoting student well-being and academic success (Rimm-Kaufman & Hamre, 2010).

The modern classroom presents unique challenges that require a nuanced understanding of student behaviours. Diverse student populations, inclusive education practices, and the integration of technology have transformed the educational landscape (Darling-Hammond et al., 2017). Pre-service teacher training Programs must evolve to address these changes, ensuring that future educators are prepared to meet the needs of all students (Cochran-Smith & Zeichner, 2010). This includes training teachers to recognize and respond to behavioural issues, adapt to various learning styles, and create inclusive environments that support all learners (Tomlinson, 2014).

Empirical studies have demonstrated the benefits of incorporating psychological insights into teacher training curricula. For instance, a study by Hattie (2009) identified visible learning strategies that align with psychological principles, showing significant impacts on student achievement. Furthermore, embedding social-emotional learning (SEL) in teacher education has been shown to improve teachers' ability to manage classrooms effectively and support students' emotional development (Jennings & Greenberg, 2009).

Despite these advancements, challenges remain in effectively integrating psychology into pre-service teacher education. One major hurdle is the variability in how teacher preparation Programs incorporate psychological content, often resulting in inconsistent training experiences (Darling-Hammond, 2010). Additionally, there is a need for more research to identify best practices for integrating psychological principles into teacher training and to evaluate their long-term impacts on teaching effectiveness and student outcomes (Goodwin & Kosnik, 2013).

Another significant challenge is ensuring that pre-service teachers can translate theoretical knowledge into practical classroom strategies. Research suggests that while teacher candidates may understand psychological theories, they often struggle to apply these concepts in real-world settings (Hammerness et al., 2005). This highlights the need for teacher education Programs to provide more opportunities for experiential learning, such as through simulations, practicum experiences, and reflective practice (Korthagen, 2010).

In response to these challenges, several innovative approaches have been proposed. For example, the use of technology in teacher education, such as virtual simulations and online modules, can provide interactive and flexible learning opportunities that enhance the integration of psychological principles (Dieker et al., 2014). Additionally, collaborative partnerships between universities and schools can create more cohesive and practical training experiences, bridging the gap between theory and practice (Dlomo et al., 2022; Zeichner, 2010).

The importance of integrating psychological insights into pre-service teacher training is further underscored by the increasing emphasis on evidence-based practices in education. As the demand for accountability and measurable outcomes in education grows, teacher preparation Programs must ensure that their curricula are grounded in research and best practices (Cochran-Smith & Lytle, 2009). This includes incorporating findings from educational psychology to develop strategies that are empirically validated and effective in promoting student learning and behaviour management (Slavin, 2017).

In conclusion, the integration of psychological insights into pre-service teacher training is vital for preparing educators to navigate the complexities of modern classrooms. By incorporating psychological principles into curriculum design, teacher education Programs can enhance the effectiveness of future teachers in managing learner behaviours and fostering positive educational outcomes. Continued research and innovation in this area are essential to address existing challenges and to ensure that teacher preparation Programs are equipped to meet the evolving needs of students in the 21st century.

Literature Review

The integration of psychological insights into pre-service teacher training has been a growing area of interest in educational research over the past decade. This approach is rooted in the understanding that effective teaching requires not only content knowledge but also a deep comprehension of student psychology and behaviour (Bransford, Darling-Hammond, & LePage, 2005). Research has consistently shown that incorporating psychological principles into teacher education can enhance teaching effectiveness and student learning outcomes (Ormrod, 2016).

One of the foundational theories in educational psychology is Vygotsky's socio-cultural theory, which emphasizes the importance of social interaction in cognitive development (Vygotsky, 1978). This theory posits that learning is inherently a social process, and teachers play a critical role in mediating and scaffolding students' learning experiences. Recent studies have applied Vygotsky's principles to modern classroom settings, demonstrating that collaborative learning and peer interaction can significantly enhance student engagement and understanding (Daniels, 2016; Mercer, 2013).

Bandura's social learning theory also provides valuable insights for teacher education. This theory highlights the role of observational learning, imitation, and modelling in behaviour acquisition (Bandura, 1986). In the context of teacher training, this suggests that pre-service teachers benefit from observing and emulating effective teaching practices. Research supports this notion, indicating that when teacher candidates have opportunities to observe skilled educators, their own teaching practices improve (Darling-Hammond, 2017).

The integration of cognitive psychology into teacher education has also been a focal point. Cognitive load theory, proposed by Sweller, Ayres, and Kalyuga (2011), offers a framework for understanding how information processing impacts learning. This theory underscores the importance of designing instructional materials that align with students' cognitive capacities to prevent overload. Studies have shown that pre-service teachers trained in

cognitive load principles are better equipped to develop instructional strategies that facilitate deeper understanding and retention (Paas, Renkl, & Sweller, 2010).

Behavioural psychology provides another critical dimension to teacher training, particularly in classroom management. Techniques derived from behavioural psychology, such as positive reinforcement and behaviour modification, have been shown to be effective in managing classroom behaviours (Emmer & Sabornie, 2015). Pre-service teachers trained in these methods report greater confidence and competence in maintaining classroom discipline, which is essential for creating a productive learning environment (Oliver & Reschly, 2010).

Motivation is a key area where psychological insights can significantly impact teaching and learning. Self-determination theory, developed by Deci and Ryan, posits that intrinsic motivation arises from the fulfilment of basic psychological needs: autonomy, competence, and relatedness (Deci & Ryan, 2000). Research has demonstrated that when teachers create environments that support these needs, student motivation and engagement increase (Ryan & Deci, 2017). Training pre-service teachers to apply self-determination principles can thus enhance their ability to foster motivated and self-regulated learners (Niemiec & Ryan, 2009).

Social-emotional learning (SEL) has gained prominence as an essential component of teacher education. SEL focuses on developing students' emotional intelligence, including skills such as empathy, self-awareness, and interpersonal communication (CASEL, 2013). Studies have shown that SEL interventions in teacher training Programs improve teachers' ability to create supportive and emotionally safe classroom environments (Jennings & Greenberg, 2009). Consequently, students in these environments exhibit better social skills, reduced emotional distress, and improved academic performance (Durlak et al., 2011).

The modern classroom is characterized by increasing diversity, requiring teachers to be adept at culturally responsive pedagogy. Culturally responsive teaching involves recognizing and valuing students' cultural backgrounds and incorporating them into the learning process (Gay, 2010). Research indicates that pre-service teachers who receive training in culturally responsive strategies are more effective in engaging diverse student populations and promoting equity in education (Banks & Banks, 2019).

Technology integration in education has also been a significant focus, particularly with the advent of digital learning environments. Educational technology can enhance learning by providing interactive and personalized experiences (Bates, 2019). However, effective technology integration requires teachers to have both technical skills and an understanding of how technology can support pedagogical goals. Studies have found that pre-service teachers benefit from training that combines technological proficiency with pedagogical knowledge, enhancing their ability to design effective digital learning experiences (Mishra & Koehler, 2006).

The importance of experiential learning in teacher education cannot be overstated. Experiential learning theories, such as Kolb's experiential learning cycle, emphasize the role of active engagement and reflection in learning (Kolb, 1984). Research has shown that pre-service teachers who participate in hands-on teaching experiences, such as practicums and simulations, develop stronger teaching skills and greater self-efficacy (Zeichner, 2010). These experiences allow them to apply theoretical knowledge in real-world contexts, facilitating deeper learning and professional growth (Ajani, 2024; Darling-Hammond et al., 2017).

Reflective practice is another critical component of effective teacher education

Reflective practice involves continuously analysing and evaluating one's teaching methods and experiences to improve professional practice (Ajani, 2023; Schön, 1983). Studies have demonstrated that pre-service teachers who engage in reflective practice develop greater awareness of their teaching strengths and areas for improvement, leading to enhanced teaching effectiveness (Larrivee, 2000). Teacher education Programs that incorporate structured reflection opportunities, such as journaling and peer feedback, have been shown to promote reflective thinking and continuous improvement (Rodgers, 2002).

The integration of psychological principles into teacher training also supports the development of professional dispositions (Govender & Ajani, 2021), such as empathy, resilience, and ethical decision-making. Research indicates that these dispositions are critical for effective teaching and student relationships (Helm, 2006). Training Programs that emphasize the development of these dispositions, alongside pedagogical and content knowledge, prepare pre-service teachers to navigate the complexities of the teaching profession with professionalism and integrity (Dottin, 2009).

Collaborative learning and professional learning communities have been highlighted as effective strategies for integrating psychological principles into teacher education (Govender et al., 2023). These approaches foster a culture of collaboration and shared learning among pre-service teachers, enabling them to learn from each other's experiences and perspectives (Vescio, Ross, & Adams, 2008). Research has shown that participation in professional learning communities enhances teachers' instructional practices and promotes a supportive professional environment (Ajani & Govender, 2023; Nyawo et al., 2024; Stoll, Bolam, McMahon, Wallace, & Thomas, 2006).

Conversely, the integration of psychological insights into pre-service teacher training is supported by a robust body of research highlighting its benefits for teaching and learning. By incorporating principles from cognitive, behavioural, and social-emotional psychology, teacher education Programs can equip future educators with the tools they need to address the diverse needs of modern classrooms. Continued research and innovation in this area are essential to develop evidence-based practices that enhance teacher preparation and ultimately improve educational outcomes for students.

Theoretical Framework

The theoretical framework for this study is underpinned by Cognitive Learning Theory (CLT), which provides a robust foundation for understanding how pre-service teachers can effectively integrate psychological insights into their instructional practices. Cognitive Learning Theory, rooted in the work of Jean Piaget and further developed by educational psychologists, emphasizes the role of mental processes in knowledge acquisition and retention (Piaget, 1952; Bruner, 1966). This theory has evolved to encompass various principles that highlight the importance of internal cognitive processes, including perception, memory, and problem-solving, in learning (Mayer, 2002).

The origins of Cognitive Learning Theory can be traced back to the early 20th century when Piaget introduced his stages of cognitive development, positing that children move through distinct stages of cognitive growth (Piaget, 1952). His work laid the groundwork for understanding how learners construct knowledge through interactions with their environment. Jerome Bruner further expanded on Piaget's ideas, emphasizing the importance of scaffolding and the spiral curriculum, which advocates revisiting basic ideas repeatedly, building upon them until the student grasps the full concept (Bruner, 1966).

The primary tenets of Cognitive Learning Theory include the concepts of schema, cognitive load, and metacognition. Schemas are mental structures that help individuals organize and interpret information, playing a crucial role in how knowledge is stored and retrieved (Ntombela et al., 2024; Sweller, Ayres, & Kalyuga, 2011). Cognitive load theory posits that learners have a limited capacity for processing information, emphasizing the need for instructional design that avoids overloading this capacity (Paas, Renkl, & Sweller, 2010). Metacognition refers to the awareness and regulation of one's own learning processes, which is critical for developing self-regulated learners (Flavell, 1979).

Cognitive Learning Theory is particularly relevant to this study as it provides a framework for integrating psychological principles into teacher education. The theory underscores the importance of understanding how learners process information, which is essential for designing effective instructional strategies. By applying cognitive principles, pre-service teachers can create learning environments that facilitate deeper understanding and retention of knowledge (Ormrod, 2016).

The rationale for using Cognitive Learning Theory in this study lies in its comprehensive approach to understanding learning processes. The theory not only explains how knowledge is acquired but also provides practical strategies for enhancing learning, such as scaffolding, chunking information to manage cognitive load, and promoting metacognitive skills (Mayer, 2002). These strategies are crucial for pre-service teachers as they develop their instructional practices. Justification for the application of Cognitive Learning Theory in this context is supported by empirical research demonstrating its effectiveness in educational settings. Studies have shown that instructional designs based on cognitive principles improve student learning outcomes by aligning with how the brain processes information (Kirschner, Sweller, & Clark, 2006). For example, cognitive load theory has been used to develop instructional materials that enhance learning efficiency by reducing extraneous cognitive load (Van Merriënboer & Sweller, 2010).

Moreover, Cognitive Learning Theory aligns with contemporary educational goals, which emphasize critical thinking, problem-solving, and the ability to apply knowledge in diverse contexts (Bransford, Brown, & Cocking, 2000). By training pre-service teachers to understand and apply cognitive principles, teacher education Programs can better prepare them to meet these goals and address the diverse needs of modern classrooms (Darling-Hammond, 2010).

The application of Cognitive Learning Theory in teacher education also supports the development of reflective practitioners. Metacognitive strategies, such as self-assessment and reflection, are integral components of cognitive theory and are essential for continuous professional growth (Mthethwa, 2022; Schön, 1983). Encouraging pre-service teachers to engage in reflective practice helps them become more aware of their instructional decisions and their impact on student learning (Larrivee, 2000). Furthermore, Cognitive Learning Theory provides a foundation for understanding the role of motivation in learning. Cognitive theories of motivation, such as expectancy-value theory, emphasize the importance of learners' beliefs about their

capabilities and the value they place on the task (Wigfield & Eccles, 2000). By incorporating these motivational principles into their teaching, pre-service teachers can create learning environments that enhance student engagement and perseverance.

Incorporating Cognitive Learning Theory into teacher education Programs also facilitates the integration of technology in the classroom. Digital tools and resources can be designed to align with cognitive principles, such as multimedia learning, which leverages dual coding theory to enhance understanding (Mncube et al., 2023; Mayer, 2009). Training pre-service teachers in these principles equips them with the skills to use technology effectively to support student learning.

Moreover, Cognitive Learning Theory supports culturally responsive teaching by providing a framework for understanding how students from diverse backgrounds process information differently. This understanding can help pre-service teachers design instructional strategies that are inclusive and responsive to the cultural contexts of their students (Gay, 2010). Research has shown that culturally responsive teaching practices improve student outcomes by making learning more relevant and accessible (Banks & Banks, 2019).

The integration of cognitive principles into teacher education also addresses the challenges of classroom management. Understanding how cognitive processes influence behaviour enables teachers to develop proactive strategies for managing classroom dynamics. For example, cognitive-behavioural strategies, such as setting clear expectations and providing consistent feedback, are effective in promoting positive student behaviour (Emmer & Sabornie, 2015).

Finally, Cognitive Learning Theory provides a basis for developing assessment practices that align with learning processes. Formative assessments, which provide ongoing feedback and guide instructional adjustments, are grounded in cognitive principles (Black & Wiliam, 2009). Training pre-service teachers to use formative assessments effectively helps them monitor student progress and adjust their teaching to meet learners' needs.

Cognitive Learning Theory offers a comprehensive framework for integrating psychological insights into pre-service teacher training. Its principles provide valuable guidance for designing instructional strategies, managing classroom behaviours, and fostering reflective practice. By grounding this study in Cognitive Learning Theory, we can develop evidence-based approaches to teacher education that enhance teaching effectiveness and improve student learning outcomes.

Method

The research methodology employed in this study was a scoping review, a comprehensive approach designed to map the breadth and depth of literature on integrating psychological insights into pre-service teacher training. The scoping review aimed to identify key concepts, theories, sources of evidence, and gaps in the existing research (Arksey & O'Malley, 2005; Levac, Colquhoun, & O'Brien, 2010). This method was selected due to its suitability for examining a broad topic area and providing a clear overview of the research landscape, which is crucial for informing future studies and policy decisions (Munn et al., 2018).

The scoping review process commenced with the development of a clear research question, which was: "How are psychological insights integrated into pre-service teacher training, and what impact do they have on learner behaviours in modern classrooms?" This question guided the search strategy and the subsequent stages of the review, ensuring a focused and systematic approach (Peters et al., 2015). The inclusion criteria for the review were established to ensure the relevance and quality of the selected studies. Articles included in the review had to be peer-reviewed, published in English between 2010 and 2024, and focus on the integration of psychological principles into pre-service teacher training. Studies that addressed the impact of such integration on learner behaviours in contemporary educational settings were also included. Both qualitative and quantitative studies were considered to provide a comprehensive understanding of the topic (Peters et al., 2015).

Conversely, the exclusion criteria were defined to maintain the focus and manageability of the review. Articles that were not peer-reviewed, published before 2010, or in languages other than English were excluded. Additionally, studies that did not specifically address pre-service teacher training or the integration of psychological insights were omitted. This rigorous exclusion process ensured that only the most relevant and high-quality studies were included in the final analysis (Pham et al., 2014).

The search strategy involved multiple electronic databases, including ERIC, PsycINFO, Scopus, and Web of Science. Keywords and search terms were developed based on the research question and included combinations of terms such as "pre-service teacher training," "psychological insights," "learner behaviours," and "modern classrooms." Boolean operators were used to refine the search and retrieve a comprehensive set of relevant articles (Peters et al., 2015). Following the initial search, all identified articles were subjected to a two-stage screening process. In the first stage, titles and abstracts were reviewed to assess their relevance to the research question. Articles that appeared to meet the inclusion criteria were then subjected to a full-text review in the

second stage. This detailed review ensured that each selected study met the established inclusion criteria and provided relevant data for the analysis (Tricco et al., 2016).

Quality assessment was an integral part of the review process. The included studies were evaluated using established quality assessment tools appropriate for both qualitative and quantitative research. These tools helped assess the methodological rigor, validity, and reliability of the studies, ensuring that the findings were robust and credible. Studies that did not meet the minimum quality thresholds were excluded from the final analysis (Hawker et al., 2002).

Data extraction was conducted systematically using a standardized form. Key information from each study, including the authors, publication year, research design, sample size, context, main findings, and conclusions, was extracted and recorded. This systematic extraction facilitated the synthesis of data across studies and helped identify common themes and gaps in the literature (Levac, Colquhoun, & O'Brien, 2010).

The synthesis of the data involved both descriptive and thematic analysis. Descriptive analysis provided an overview of the characteristics of the included studies, such as publication trends and research designs. Thematic analysis was used to identify and analyse key themes and patterns related to the integration of psychological insights into pre-service teacher training and its impact on learner behaviours. This dual approach provided a comprehensive understanding of the research landscape and highlighted areas for future investigation (Braun & Clarke, 2006).

Throughout the review process, efforts were made to ensure transparency and reproducibility. Detailed records of the search strategy, screening decisions, and data extraction were maintained. This transparency enhances the credibility of the review and allows other researchers to replicate the study or build upon its findings (Tricco et al., 2016). The scoping review methodology employed in this study provided a systematic and comprehensive approach to mapping the existing literature on the integration of psychological insights into pre-service teacher training. By rigorously defining inclusion and exclusion criteria, employing robust quality assessment tools, and systematically extracting and synthesizing data, the review offers valuable insights into current research trends, identifies gaps in the literature, and suggests directions for future research.

Findings

The scoping review on integrating psychological insights into pre-service teacher training yielded significant findings that highlight the current landscape, trends, and gaps in the literature. The results are organized into five sub-sections: cognitive principles in curriculum design, impact on learner behaviours, challenges and barriers, effective strategies, and future directions (Mpuangnan & Ntombela, 2023).

5.1. Cognitive Principles in Curriculum Design

The review identified that many pre-service teacher training Programs incorporate cognitive principles into their curriculum design. Cognitive Load Theory (CLT), which emphasizes managing the cognitive demands placed on learners to optimize their learning capacity, is prominently featured. Sweller, Ayres, and Kalyuga (2011) highlight that well-designed instructional materials reduce extraneous cognitive load and promote effective learning. Several studies confirm that teacher education Programs adopting CLT principles enhance pre-service teachers' abilities to design instruction that facilitates deeper understanding and retention of knowledge (Baloyi et al., 2023; Paas, Renkl, & Sweller, 2010; Kirschner, Sweller, & Clark, 2006).

Moreover, metacognitive strategies are increasingly integrated into teacher training curricula. Metacognition, or the awareness and regulation of one's learning processes, is crucial for developing self-regulated learners (Flavell, 1979). Research indicates that pre-service teachers trained in metacognitive strategies can better guide their students in reflecting on their learning processes, thereby improving academic performance (Schraw & Moshman, 1995; Zimmerman, 2002).

5.2. Impact on Learner Behaviours

Integrating psychological insights into teacher training positively impacts learner behaviours. Studies demonstrate that pre-service teachers equipped with knowledge of behavioural psychology and cognitive principles are more effective in managing classrooms and fostering positive student behaviours (Emmer & Sabornie, 2015; Oliver & Reschly, 2010). For instance, the application of positive reinforcement techniques, derived from behavioural psychology, has been shown to reduce disruptive behaviours and promote a conducive learning environment (Skinner, 1953).

Additionally, the understanding and application of Vygotsky's socio-cultural theory have been linked to improved student engagement and interaction. Teachers who create collaborative learning environments, as suggested by Vygotsky, facilitate social interaction and peer learning, which are critical for cognitive and social development (Vygotsky, 1978; Daniels, 2016). These environments encourage students to engage actively in their learning processes, thereby enhancing their motivation and academic outcomes (Mercer, 2013).

5.3. Challenges and Barriers

Despite the positive impacts, several challenges and barriers hinder the effective integration of psychological insights into pre-service teacher training. One significant challenge is the variability in how these principles are incorporated across different Programs. Darling-Hammond (2010) notes that inconsistent training experiences can lead to disparities in pre-service teachers' preparedness to apply psychological insights in their teaching.

Moreover, there is often a gap between theoretical knowledge and practical application. Hammerness et al. (2005) emphasize that while pre-service teachers may understand psychological theories, they frequently struggle to implement these concepts effectively in classroom settings. This gap underscores the need for more experiential learning opportunities, such as practicums and simulations, to bridge the theory-practice divide (Korthagen, 2010).

Another barrier is the limited availability of resources and support for integrating psychological principles into teacher education Programs. Many institutions face constraints related to funding, faculty expertise, and access to relevant training materials (Cochran-Smith & Zeichner, 2010). These constraints can impede the comprehensive adoption of psychological insights in curriculum design and delivery.

5.4. Effective Strategies

The review identified several effective strategies for integrating psychological insights into pre-service teacher training. One key strategy is the use of technology-enhanced learning tools. Digital platforms and virtual simulations provide interactive and flexible learning opportunities that help pre-service teachers apply cognitive and behavioural principles in simulated classroom environments (Dieker et al., 2014; Mishra & Koehler, 2006).

Collaborative learning and professional learning communities are also effective in promoting the integration of psychological insights (Buthelezi & Ajani, 2023). Vescio, Ross, and Adams (2008) found that participation in professional learning communities enhances teachers' instructional practices by fostering a culture of collaboration and shared learning (Ajani, 2023). These communities provide a supportive environment where pre-service teachers can exchange ideas, reflect on their experiences, and learn from each other.

Furthermore, incorporating reflective practice into teacher training Programs is essential. Reflective practice encourages pre-service teachers to critically analyse their teaching methods and the impact of their instructional strategies on student learning (Ajani, 2022; Schön, 1983). Studies show that structured reflection activities, such as journaling and peer feedback, promote deeper understanding and continuous improvement in teaching practices (Rodgers, 2002; Larrivee, 2000).

6. Future Directions

The findings from this review highlight several areas for future research and development. First, there is a need for more empirical studies that evaluate the long-term impacts of integrating psychological insights into pre-service teacher training on both teaching effectiveness and student outcomes. Such studies can provide evidence-based practices that inform curriculum design and policy decisions (Goodwin & Kosnik, 2013).

Second, research should explore innovative approaches to bridging the gap between theory and practice. For example, leveraging advancements in technology to create immersive learning experiences, such as augmented reality (AR) and virtual reality (VR), can provide pre-service teachers with realistic practice scenarios that enhance their skills and confidence (Ferdig & Pytash, 2020).

Third, it is crucial to examine the cultural relevance of psychological principles in diverse educational contexts. Understanding how cognitive and behavioural theories apply to students from various cultural

backgrounds can help develop culturally responsive teaching practices that address the needs of all learners (Gay, 2010; Banks & Banks, 2019). Finally, future research should focus on developing comprehensive frameworks for integrating psychological insights into teacher education Programs. These frameworks should include guidelines for curriculum design, instructional strategies, assessment practices, and professional development that align with cognitive and behavioural principles (Bransford, Brown, & Cocking, 2000; Darling-Hammond et al., 2017).

The scoping review revealed that integrating psychological insights into pre-service teacher training has the potential to significantly enhance teaching effectiveness and improve learner behaviours. However, challenges such as variability in Programme implementation, the theory-practice gap, and resource constraints need to be addressed. Effective strategies, including technology-enhanced learning, collaborative learning, and reflective practice, have shown promise in promoting the integration of psychological principles. Future research should focus on evaluating the long-term impacts, exploring innovative approaches, examining cultural relevance, and developing comprehensive frameworks to further advance the field of teacher education.

Discussion

The findings from the scoping review reveal substantial evidence supporting the integration of psychological insights into pre-service teacher training, with a particular emphasis on Cognitive Learning Theory (CLT). This discussion section will critically examine these findings in light of CLT, highlighting how cognitive principles can be effectively integrated into teacher education Programs to enhance teaching practices and learner outcomes.

Cognitive Learning Theory, rooted in the works of Jean Piaget and further developed by educational psychologists like Mayer (2002), emphasizes the importance of understanding mental processes in learning. The review highlighted that many pre-service teacher training Programs have adopted CLT principles, such as managing cognitive load and promoting metacognitive strategies, to enhance instructional design. This aligns with Sweller, Ayres, and Kalyuga's (2011) assertion that reducing extraneous cognitive load can significantly improve learning outcomes by allowing students to focus on essential information.

The impact of cognitive principles on learner behaviours is evident in the review findings. Pre-service teachers trained in CLT are better equipped to design instruction that promotes deep learning and retention (Paas, Renkl, & Sweller, 2010). This capability is critical in modern classrooms, where diverse learner needs demand differentiated instructional strategies. The application of cognitive principles ensures that teaching methods are aligned with how students process information, enhancing their engagement and academic performance (Kirschner, Sweller, & Clark, 2006).

However, the review also identified challenges and barriers to the effective integration of psychological insights into pre-service teacher training. Variability in Programme implementation and the gap between theoretical knowledge and practical application were significant issues (Darling-Hammond, 2010; Hammerness et al., 2005). These challenges highlight the need for teacher education Programs to provide more experiential learning opportunities, such as practicums and simulations, to bridge the theory-practice divide (Korthagen, 2010).

Reflective practice, a key component of CLT, emerged as an effective strategy for integrating psychological insights into teacher training. Reflective practice encourages pre-service teachers to analyse their teaching methods critically and consider the impact of their instructional strategies on student learning (Schön, 1983). Studies have shown that structured reflection activities, such as journaling and peer feedback, promote deeper understanding and continuous improvement in teaching practices (Rodgers, 2002; Larrivee, 2000). This process aligns with Flavell's (1979) concept of metacognition, where teachers become more aware of their cognitive processes and can adjust their strategies accordingly.

The review also underscored the importance of technology-enhanced learning tools in promoting the integration of cognitive principles. Digital platforms and virtual simulations provide interactive and flexible learning opportunities, allowing pre-service teachers to apply cognitive and behavioural principles in simulated classroom environments (Dieker et al., 2014; Mishra & Koehler, 2006). These tools align with Mayer's (2009) principles of multimedia learning, which emphasize the use of both visual and verbal information to enhance understanding and retention.

Collaborative learning and professional learning communities were identified as effective strategies for integrating psychological insights. These approaches foster a culture of collaboration and shared learning among pre-service teachers, enabling them to learn from each other's experiences and perspectives (Vescio, Ross, & Adams, 2008). This collaborative approach is supported by Vygotsky's socio-cultural theory, which emphasizes the role of social interaction in cognitive development (Vygotsky, 1978).

Despite the benefits of these strategies, the review highlighted the need for ongoing research to evaluate the long-term impacts of integrating psychological insights into pre-service teacher training. Empirical studies are necessary to provide evidence-based practices that inform curriculum design and policy decisions (Goodwin & Kosnik, 2013). Additionally, research should explore innovative approaches to bridging the gap between theory and practice, such as leveraging advancements in technology to create immersive learning experiences (Ferdig & Pytash, 2020).

Cultural relevance is another critical aspect that needs further exploration. Understanding how cognitive and behavioural theories apply to students from various cultural backgrounds can help develop culturally responsive teaching practices that address the needs of all learners (Gay, 2010; Banks & Banks, 2019). This consideration aligns with CLT's emphasis on the importance of context in learning, as highlighted by researchers like Bransford, Brown, and Cocking (2000).

The findings also suggest that developing comprehensive frameworks for integrating psychological insights into teacher education Programs is essential. These frameworks should include guidelines for curriculum design, instructional strategies, assessment practices, and professional development that align with cognitive and behavioural principles (Darling-Hammond et al., 2017). Such frameworks can provide a structured approach to integrating psychological insights into teacher training, ensuring consistency and effectiveness across Programs.

Moreover, the review indicates that cognitive principles, such as cognitive load theory and metacognition, are crucial for effective classroom management. Teachers trained in these principles can design instructional strategies that not only facilitate learning but also promote positive classroom behaviours by reducing cognitive overload and enhancing student engagement (Sweller, Ayres, & Kalyuga, 2011; Zimmerman, 2002).

The integration of Cognitive Learning Theory into pre-service teacher training Programs has the potential to significantly enhance teaching practices and learner outcomes. By addressing the challenges and barriers identified in the review, such as variability in Programme implementation and the theory-practice gap, teacher education Programs can better prepare pre-service teachers to apply cognitive principles in their instructional practices. Effective strategies, such as reflective practice, technology-enhanced learning, and collaborative learning, have shown promise in promoting the integration of psychological insights. Future research should focus on evaluating the long-term impacts of these strategies, exploring innovative approaches to bridging the theory-practice gap, and developing comprehensive frameworks for integrating psychological insights into teacher education Programs. Through these efforts, teacher education Programs can ensure that pre-service teachers are equipped with the knowledge and skills needed to address the diverse needs of modern classrooms and promote positive learner behaviours.

Conclusions

The study concludes that integrating psychological insights, particularly those derived from Cognitive Learning Theory, into pre-service teacher training significantly enhances teaching effectiveness and improves learner behaviours. Key findings underscore the importance of incorporating cognitive principles such as cognitive load management, metacognitive strategies, and reflective practice into teacher education curricula. The study also highlights the critical role of experiential learning, technology-enhanced tools, and culturally responsive teaching in bridging the theory-practice gap. The impact of this study is profound, providing a comprehensive framework for future interventions aimed at developing more effective teacher education Programs that are equipped to meet the diverse needs of modern classrooms, thereby fostering improved educational outcomes for all students.

Implications of the Study

The findings from this study have significant implications for various stakeholders in the field of education, including policymakers, teacher educators, curriculum developers, and pre-service teachers. By integrating

psychological insights, particularly those from Cognitive Learning Theory (CLT), into pre-service teacher training, stakeholders can enhance teaching effectiveness and improve learner outcomes.

For policymakers, the results highlight the importance of developing and supporting policies that mandate the inclusion of cognitive principles in teacher education Programs. As evidenced by Darling-Hammond et al. (2017), comprehensive policies that focus on cognitive and behavioural insights can create a standardized approach to teacher training, ensuring that all pre-service teachers receive consistent and high-quality education. Policymakers should advocate for the allocation of resources to support the integration of these principles, including funding for training materials, faculty development, and technology-enhanced learning tools.

Teacher educators are pivotal in implementing these findings. They must be well-versed in cognitive theories and equipped to convey these principles to pre-service teachers effectively. The incorporation of reflective practice, as highlighted by Schön (1983), is essential for developing teachers who can critically analyse and adapt their instructional strategies. Teacher educators should facilitate opportunities for experiential learning, such as practicums and simulations, which have been shown to bridge the gap between theory and practice (Korthagen, 2010).

Curriculum developers must prioritize the integration of CLT principles into teacher education curricula. This includes designing courses that emphasize cognitive load management, metacognitive strategies, and the application of cognitive-behavioural techniques (Sweller, Ayres, & Kalyuga, 2011). Curriculum developers should also ensure that these courses are culturally responsive, addressing the diverse needs of learners and incorporating culturally relevant teaching practices (Gay, 2010; Banks & Banks, 2019).

Pre-service teachers themselves are key beneficiaries of these findings. The study underscores the importance of equipping them with a robust understanding of cognitive principles and their practical applications in the classroom. Training that includes reflective practice and metacognitive strategies will prepare pre-service teachers to foster self-regulated learners and promote positive student behaviours (Zimmerman, 2002). Pre-service teachers should be encouraged to engage in continuous professional development to stay abreast of new research and advancements in educational psychology (Bransford, Brown, & Cocking, 2000).

The implications for school administrators are also noteworthy. Administrators play a crucial role in creating an environment that supports the application of cognitive principles. This includes providing professional development opportunities for in-service teachers and fostering a culture of collaboration and reflective practice within schools (Vescio, Ross, & Adams, 2008). By supporting teachers in implementing cognitive strategies, administrators can enhance overall school performance and student outcomes (Darling-Hammond et al., 2017).

Additionally, the study suggests that integrating technology into teacher education can significantly enhance the application of cognitive principles. Educational technologies, such as virtual simulations and digital platforms, provide interactive and flexible learning opportunities that align with Mayer's (2009) principles of multimedia learning. Stakeholders should invest in and promote the use of these technologies to facilitate effective teacher training and improve instructional practices.

The implications of this study extend to professional development providers as well. Continuous professional development is critical for ensuring that teachers remain effective throughout their careers. Providers should design professional development Programs that incorporate the latest research in cognitive psychology and offer practical strategies for classroom application (Guskey, 2002). These Programs should also include opportunities for teachers to engage in reflective practice and collaborate with peers to share best practices and learn from each other's experiences (Stoll et al., 2006).

Furthermore, the study highlights the need for ongoing research to evaluate the long-term impacts of integrating cognitive principles into teacher education. Researchers should conduct longitudinal studies to assess how these principles affect teaching practices and student outcomes over time (Goodwin & Kosnik, 2013). Such research can provide valuable insights that inform future teacher education Programs and policy decisions, ensuring that they are grounded in evidence-based practices.

The implications of this study are far-reaching, affecting various stakeholders in the education sector. By integrating psychological insights, particularly those from Cognitive Learning Theory, into pre-service teacher training, stakeholders can enhance the quality of teacher education and ultimately improve student learning outcomes. Policymakers, teacher educators, curriculum developers, pre-service teachers, school

administrators, professional development providers, and researchers all have a role to play in implementing these findings and ensuring that teacher education Programs are effective, comprehensive, and responsive to the diverse needs of learners in the 21st century. Through collaborative efforts and a commitment to continuous improvement, the education community can ensure that future teachers are well-prepared to meet the challenges of modern classrooms and promote positive learner behaviours.

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