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DEVELOPING A RESILIENT EARLY CHILDHOOD EDUCATION CURRICULUM: A DISRUPTION-RESILIENCY CONTINUUM THEORY

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ABSTRACT

Understanding a resilient early childhood curriculum is vital in ensuring educational continuity amid disruptions. This study aims to develop a theory describing a disruption-resilient early childhood education curriculum continuum. A deductive axiomatic approach to theory development was utilized, where scholarly literature serves as the foundational basis for generating a theory. An extensive review of related literature was conducted to analyze the data collected from available research studies. The theory was developed based on the readings and discussions about early childhood education, curriculum development, and educational resilience. Axioms were generated to come up with propositions. The following propositions are posed: 1.) An early childhood education curriculum that focuses on essential knowledge and skills for learners is resilient to disruptions. 2.) An early childhood education curriculum that is flexible in design and delivery is resilient to disruptions. 3.) An early childhood program with strong parent-teacher collaboration contributes to curriculum resilience during disruptions. 4.) Professional development for educators contributes to curriculum resilience. The propositions concluded that the continuum of a disruption-resilient early childhood education curriculum comprises three interconnected components: essential knowledge and skills, flexible design and delivery, and an activated support system. This theory presents significant applications for ensuring the continuity of quality early childhood education, even in the face of disruptions.

Keywords: curriculum, disruption, early childhood education resilience, theory generation

INTRODUCTION

Early childhood education (ECE) institutions play a crucial role in shaping the foundational years of a child's development. The importance of these formative years cannot be overstated, as the first five years of a child's life are critical for brain development, with neural connections forming rapidly and never again matched in life (Silver et al, 2022). High-quality early childhood education lays the foundation for future academic success, social-emotional development, and overall well-being (Shavkatovna, 2023; Wustmann-Seiler et al., 2022). Research has consistently shown that children who receive high-quality ECE demonstrate

improved cognitive skills, better social-emotional competence, and higher academic achievement in later years (Eadie et al., 2024).

However, the global landscape of education has been marked by unprecedented disruptions in recent years, exposing the vulnerability of educational systems worldwide, particularly in early childhood education. The COVID-19 pandemic, natural disasters, and socio-political upheavals have revealed the fragility of existing ECE curricula(Atiles et al., 2021; Spiteri, 2021; Su et al., 2022). Recent research by Temiz et al. (2023) revealed that while early childhood teachers attempted to sustain communication and educational activities during school closures, these efforts proved difficult to maintain throughout entire semesters. Their study identified particular concerns about learning loss during home confinement and its negative consequences for children from low socioeconomic backgrounds, who faced additional barriers including limited access to distance education opportunities and increased screen time due to parents' challenges in managing at-home learning.

UNESCO (2022) reported that over 167 million children across 196 countries lost access to early childhood care and education services due to the pandemic. This disruption has had significant impacts on children's learning and development. A study by Engzell et al. (2021) found that students made little or no progress while learning from home, with learning losses equivalent to one-fifth of a school year. In the Philippines, the Department of Education (DepEd, 2021) reported that approximately 3 million learners aged 3-4 years old were affected by school closures in 2020, potentially widening the existing educational inequalities (Adelman et al., 2021).

Beyond the pandemic, other forms of disruptions continue to challenge ECE. The World Bank (2023) reported that between 2000 and 2022, over 559 million children experienced at least one climate-related disaster. These events disrupt education and have long-lasting effects on children's physical and mental health (Helldén et al., 2021). In the Philippines, an average of 20 typhoons hit the country annually, frequently resulting in school closures and interruptions to early learning programs (PAGASA, 2023). A study by Marchetta et al. (2021) found that exposure to typhoons in early childhood significantly negatively affects children's long-term educational outcomes.

With these disruptions, it is crucial that early childhood education institutions will be guided to adapt these disruptions for continued child learning and development. This is particularly important given findings from Wai Leng et al. (2021) that while teachers demonstrated high degrees of alignment between their beliefs and classroom practices, the reciprocal relationship with parents needed enhancement - a weakness that became particularly apparent during pandemic disruptions. Furthermore, Yoke-Yean et al. (2021) identified several key systemic challenges in ensuring accessible quality early childhood education, including gaps in inter-agency cooperation, procedural inefficiencies, and challenges in providing support services for children.

As far as studies, frameworks and theories resilience is concerned, current literature has revealed a number on how it is achieved. However, while these frameworks are useful, no framework has particularly addressed in educational context particularly in early childhood education.

Existing Literature of Resilience

The studies, frameworks and theories on resilience has developed through theoretical and empirical advances across multiple disciplines. This progression has shaped our understanding while also revealing gaps that need to be addressed. The field of resilience research originated in developmental psychopathology, with Garmezy's Project Competence Longitudinal Study establishing resilience as a dynamic process rather than a fixed trait (Masten & Tellegen, 2012).

This shift in understanding opened new avenues for investigating how resilience can be developed and supported across different contexts. Werner and Smith's (1982) provided crucial empirical validation by identifying specific protective factors that enable positive adaptation despite adversity. Their 40-year investigation of high-risk children established a framework for understanding resilience mechanisms and the importance of protective factors in development.

The field advanced with Rutter's (1987) transactional model, which emphasized the interaction between individual characteristics and environmental factors. His concept of "steeling effects" suggested that controlled exposure to challenges could enhance adaptive capacity, introducing important implications for how institutions might systematically build resilience.

Building on these foundations, resilience theory expanded into ecological systems through Holling's work on adaptive cycles and system dynamics (Gunderson & Holling, 2002). This ecological perspective provided crucial insights about how systems respond to disturbances and maintain functionality across different scales. Walsh's (2016) Family Resilience Framework and Ungar's (2011) social-ecological models further expanded theoretical understanding by demonstrating how resilience operates across interconnected systems. These frameworks identified key processes across multiple domains and emphasized the importance of cultural and contextual influences on resilience development.

The development of High Reliability Organization theory marked an important transition in applying resilience concepts to human organizations (Dwyer et al., 2023). Studies of organizations that maintained exceptional safety records despite high-risk operations provided insights into organizational practices that enhance resilience. Sundstrom and Allen (2019) demonstrated how complex adaptive systems exhibit common patterns of growth, conservation, collapse, and renewal across multiple scales.

Recent advances in neurobiology have enhanced our understanding of resilience mechanisms. Southwick and Charney's (2012) research established connections between psychological and neurobiological aspects of resilience, identifying specific neural circuits and molecular processes that underlie adaptive responses to stress. Masten's (2014) integrative model synthesizes findings across disciplines, conceptualizing resilience as an emergent property of complex adaptive systems. This framework incorporates insights from neuroscience, developmental psychology, and systems theory, providing a comprehensive model for understanding resilience processes.

Contemporary resilience theory encompasses multiple perspectives and approaches, from developmental to ecological to organizational. While this diversity has generated rich insights, it has also created challenges in developing coherent frameworks for specific contexts. The field now faces the task of integrating these various perspectives while addressing context-

specific needs, particularly in educational settings where the COVID-19 pandemic has highlighted the urgent need for resilient systems, as documented by UNESCO (2022).

While existing research has established the importance of resilience in educational systems and documented various responses to disruptions, there remains a critical theoretical gap in understanding how to systematically develop resilient early childhood education curricula. Current frameworks primarily focus on general organizational resilience or crisis response, without adequately addressing the unique developmental needs and pedagogical requirements of early childhood education. Additionally, while studies have examined individual components like teacher adaptability or parent engagement, there is no comprehensive theoretical framework that integrates these elements to explain how curriculum resilience emerges and can be sustainably maintained in early childhood settings. The fragmented nature of existing approaches has left practitioners without clear guidance for building resilient systems that can preserve essential learning while adapting to various disruptions. This study addresses these gaps by developing an integrated theoretical framework that synthesizes insights from resilience research, developmental psychology, and educational systems theory to explain how early childhood programs can build and maintain resilient curricula. The research will utilize a deductive approach to theory development, where scholarly literature is the foundation for generating a theory (Zalaghi & Khazaei, 2016). Secondary analysis will be used to analyze data collected from available research studies and literature, following the methodology outlined by Johnston (2014) for theory development using existing literature.

METHODOLOGY

This study employed the deductive axiomatic approach in theory development. As Gilgun (2019) described, the deductive approach starts with formulating general ideas and progresses to specific conclusions. Bayne (2018) refers to this as top-down thinking, which typically begins with different axioms. These axioms, also known as primitive assumptions or propositions (Delaram & Valilai, 2018), form the foundation of the theory. The process of formulating the Disruption-Resiliency Continuum Theory in Early Childhood Education followed Padua's (2012) steps.

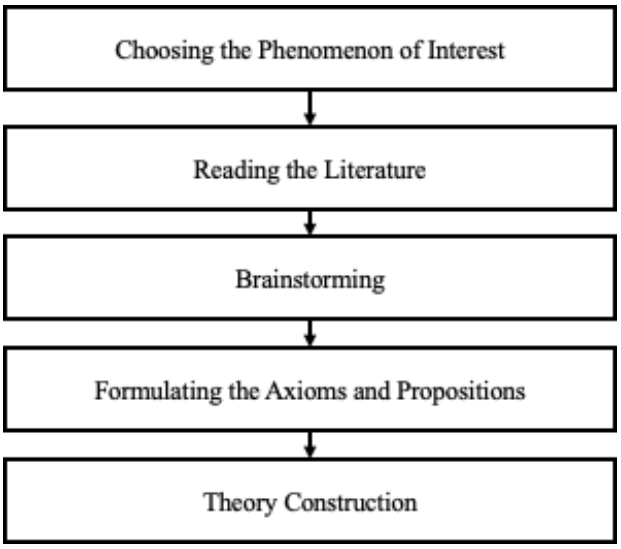


Figure 1. Deductive Axiomatic Approach to Theory Development

Choosing the Phenomenon of Interest

The first step involved selecting the focus of the theory development. In this case, the phenomenon of interest was the resiliency of early childhood education curricula. This choice was crucial as it served as the central point around which the theory was developed, encompassing various underlying ideas related to curriculum resilience in early childhood education (George, 2019). This phenomenon was selected by personal and professional experience in early childhood education and observations of how curricula needed to adapt during recent global disruptions, notably the COVID-19 pandemic. This personal insight, combined with a preliminary review of current educational challenges, led to identifying curriculum resilience as a critical area for theory development.

Reading the Literature

After identifying the phenomenon of interest, an extensive literature review was conducted. This step was vital in substantiating the importance of curriculum resilience in early childhood education. The literature review allowed for a comprehensive exploration of the topic, elaborating on curriculum resilience and laying down details to broaden the knowledge base (Bennett & Royle, 2016). This process helped contextualize the nature of the developed theory, facilitating the identification of gaps and the construction of axioms and propositions (Mintzberg, 2017).

A systematic review of peer-reviewed articles, books, and policy documents related to early childhood education, curriculum development, and educational resilience was conducted to achieve this. This involved searching academic databases such as ERIC, PsycINFO, and Google Scholar using keywords like "early childhood education," "curriculum resilience," and "educational adaptability." Recent publications from organizations like UNESCO were also reviewed to capture global perspectives.

Brainstorming

The brainstorming phase involved eliciting pertinent information that connected various ideas and presented different perspectives on curriculum resilience in early childhood education. This stage promotes coherence and cohesiveness of information (Henningsen & Henningsen, 2018), helping to align facts and related articles to exemplify the importance of curriculum resilience (Seeber et al., 2017).

Brainstorming techniques were employed to facilitate this process, utilizing mind mapping to visualize connections between different aspects of curriculum resilience. Additionally, informal discussions with colleagues in early childhood education and other researchers working with theory generation were conducted to gather diverse perspectives and insights.

Formulating the Axioms and Propositions

After gathering and analyzing related literature and studies, axioms and propositions were formulated. This phase was essential in theory development, as axioms serve as fundamental theorems and primitive assumptions that govern the propositions, while propositions are statements that result from the axioms (Novikov, 2011). In the context of this study, axioms are understood as postulates or fundamental theorems that can be accepted without debate.

(Lehrer, 2018). These axioms are then processed and assimilated into propositions (Zhang et al., 2019).

Based on the literature review and brainstorming sessions, recurring themes and fundamental principles related to curriculum resilience in early childhood education were identified. These were distilled into four axioms that formed the foundation of the theory. For the four axioms, four propositions were drafted, carefully considering how each one logically followed the axioms and related to the overall concept of curriculum resilience. This process involved multiple iterations of refining and rephrasing to ensure clarity and consistency.

Theory Construction

The final step involved aligning all the propositions to identify and conclude the theory (Stergiou & Airey, 2018). The Disruption-Resiliency Continuum Theory in Early Childhood Education was constructed by integrating the interrelated facts, ideas, propositions, concepts, and definitions derived from the axioms and propositions. This process resulted in a systematic view that aims to predict and explain the phenomenon of curriculum resilience in early childhood education (Kivunja, 2018).

A conceptual framework was created to construct the theory that visually represented the relationships between the axioms and propositions. This framework was iteratively refined to ensure logical coherence and coverage of the phenomenon. A detailed narrative was then written explaining the theory, its components, and how it addresses the central question of what makes a resilient early childhood education curriculum. The theory was further validated through peer review, where colleagues in early childhood education, curriculum development, and other researchers who work in theory generation provided feedback on its clarity, coherence, and potential applicability.

RESULTS

Phenomenon

This study examines the resilience of early childhood education curricula in the face of disruptions. Early childhood, defined as the first eight years of life, is a critical period for cognitive, social, emotional, and physical development. However, this stage of education is vulnerable to various disruptions, including natural disasters, health crises, and socio-political changes. These disruptions can significantly impact children's developmental trajectories, potentially leading to long-term consequences.

With this, the researcher aimed to develop a theory to guide the creation of disruption-resilient early childhood education curricula. Understanding the components of resilient curricula and how they can be implemented effectively to support children's holistic development, even in the face of unexpected challenges, is vital. Thus, this paper develops the Disruption-Resiliency Continuum Theory of Early Childhood Education to understand how early childhood education can maintain its effectiveness and continuity in the face of various disruptions.

Derivation of Axioms and Propositions

After an extensive review of the literature, the axioms, which are statements that are proven to be self-evidently true and non-debatable, were extracted. After identifying the axioms, propositions were then formulated.

Table 1

Formulated Propositions from Extracted Axioms

Axioms	Propositions	Theory
Axiom 1. A well-planned curriculum in early childhood education is crucial for children's physical, cognitive, and socio-emotional development. **Axiom 2.** Effective implementation of an early childhood curriculum requires the active involvement of key stakeholders, particularly parents and teachers. **Axiom 3**. Disruptions are inevitable when implementing the curriculum due to various factors. **Axiom 4**. During disruptions, curriculum adaptation and resilience are needed.	**Proposition 1**. An early childhood education curriculum that focuses on essential knowledge and skills for learners is resilient to disruptions. *(Axiom 1, 3, 4)* **Proposition 2**. An early childhood education curriculum that is flexible in design and delivery is resilient to disruptions. *(Axiom 1, 3, 4)* **Proposition 3.** An early childhood program with strong parent-teacher collaboration contributes to curriculum resilience during disruptions. (*Axiom 2,4*) **Proposition 4.** Professional development for educators contributes to curriculum resilience. *(Axiom 1,4)*	A disruption-resilient early childhood curriculum follows a continuum that addresses essential knowledge and skills, flexible design and delivery, and support systems among teachers and parents.

Early childhood represents a critical period for human development across multiple dimensions: cognitive, social, emotional, and physical. This stage is characterized by rapid and significant growth that shapes the trajectory of a child's life in lasting ways. The importance of these formative years cannot be overstated, as they lay the foundation for future learning, behavior, health, and physical capabilities (Black et al., 2017). In this context, a well-planned curriculum in early childhood education plays a pivotal role in shaping a child's developmental trajectory.

The importance of structured, intentional approaches to early learning has been highlighted by Shuey and Kankaraš (2018). High-quality early childhood education programs, characterized by carefully constructed frameworks guiding educational activities and experiences, have been shown to have long-lasting positive effects on cognitive and socio-emotional development, academic achievement, and even later life outcomes. At the core of these effective programs lies a balanced approach that combines structure with flexibility (Bettencourt et al., 2023).

Pyle and Danniels (2017) argue that integrating play-based learning within a structured framework allows for guided instruction and child-led exploration, creating a dynamic learning environment that fosters holistic development. This balanced approach significantly enhances

children's school readiness and early academic skills while meeting the diverse needs of young learners, as further emphasized by Rao et al. (2019).

Crucially, a well-planned curriculum in early childhood education must take a holistic approach, addressing all domains of child development – cognitive, social, emotional, and physical. Bautista et al. (2022) argue the importance of such comprehensive approaches, while Slot (2023) provides evidence of effectiveness in promoting well-rounded development. This holistic view acknowledges the rapid brain development during early childhood, which Tierney and Nelson (2019) note presents both opportunities and potential risks. Carson et al. (2017) highlight that this period is critical for developing fundamental motor skills that form the building blocks for more complex physical activities later in life.

The foundations for social competence and emotional regulation are also established in the earliest years. The capacity to understand and regulate emotions is now recognized as a critical component of school readiness, as emphasized by Housman (2017). Thompson and Lagattuta (2022) further underscore the importance of early childhood in laying the groundwork for emotional understanding and regulation, skills crucial for success in both academic and social spheres.

Assessment and monitoring are vital components in this implementation process. According to Martin et al. (2015), curriculum-aligned assessment tools provide crucial insights into children's progress across various developmental domains. These tools enable educators to tailor their approaches, ensuring that all children are adequately supported in their learning journey and that the curriculum remains responsive to individual needs. Alasuutari and Kelle (2023) further explore the implications of such assessment practices in early childhood education, emphasizing their role in maintaining curriculum effectiveness.

Recent global events have highlighted the importance of adaptability in educational frameworks. Kim et al. (2020) emphasize how the COVID-19 pandemic underscored the need for flexible yet robust curricula that can withstand disruptions while maintaining educational continuity. Well-structured educational plans can provide stability and support children's learning even in challenging circumstances, showcasing the resilience of a thoughtfully designed curriculum (Samuelsson et al., 2022).

Providing a structured yet flexible framework that addresses all aspects of a child's development sets the stage to adapt to changing circumstances. Hence, we can conclude **Axiom 1**: **"A well-planned curriculum in early childhood education is crucial for children's physical, cognitive, and socio-emotional development."**

The role of teachers in shaping and implementing curriculum has long been recognized. However, recent studies have emphasized the critical nature of teacher involvement in curriculum decision-making. Erss et al. (2023) found that when teachers are actively involved in curriculum development, they are more likely to implement it effectively. This will lead to improved student outcomes. Teachers' expertise and classroom experience provide invaluable insights into the practical aspects of curriculum implementation. Leach et al. (2022) demonstrated that teacher input in curriculum design leads to more realistic and achievable learning objectives, better alignment with students' needs, and more effective teaching strategies. This highlights the unique perspective that teachers bring to the curriculum development process.

Concurrently, the role of parents in early childhood education has gained increased attention. Parental involvement in their children's education is positively associated with academic achievement and social-emotional development (Boonk et al., 2023). This suggests that parents have a vested interest in and significant impact on their children's education. Moreover, research has shown that incorporating parents' cultural knowledge and home experiences into the curriculum can enhance its relevance and effectiveness. Durden et al. (2023) found that culturally responsive curricula, developed with input from diverse parents, improved engagement and learning outcomes for children from various backgrounds.

Educational partnerships between schools and families have gained traction in recent years. When schools actively involve parents in curriculum-related decisions, it leads to increased parental engagement, improved home-school communication, and better support for children's learning at home (O'Connor et al., 2022). This suggests that viewing parents as curriculum stakeholders can have far-reaching benefits. However, involving teachers and parents in curriculum development is challenging challenging. Kim and Sheridan (2023) identified potential barriers such as time constraints, differing expectations, and power dynamics. Nevertheless, they argue that overcoming these challenges through structured collaboration processes can lead to more comprehensive and practical curricula.

The COVID-19 pandemic has further highlighted the importance of involving both teachers and parents in curriculum decisions. Samuelsson et al. (2022) found that preschools with solid partnerships with parents could better adapt their curricula to remote and hybrid learning contexts, ensuring continuity of education during disruptions. Recent policy recommendations also reflect this shift towards recognizing multiple stakeholders in early childhood education. The OECD (2023) report on early childhood education emphasizes the importance of participatory curriculum development approaches, explicitly mentioning teachers and parents as key stakeholders. Thus, we craft **Axiom 2**, which states, "**Effective implementation of an early childhood curriculum requires active involvement of key stakeholders, particularly parents and teachers.**"

Curriculum disruptions are an unavoidable reality, driven by various unpredictable factors. Natural disasters, such as earthquakes, floods, hurricanes, and pandemics, have repeatedly demonstrated their capacity to disrupt educational systems worldwide. For instance, the COVID-19 pandemic resulted in widespread school closures, compelling a rapid shift to online learning and fundamentally altering traditional curricula. This global health crisis highlighted the vulnerability of educational systems to sudden and extensive disruptions (UNESCO, 2020). The pandemic's impact was not an isolated incident; historical precedents such as the 2004 Indian Ocean tsunami and Hurricane Katrina in 2005 similarly caused significant educational interruptions, underscoring the ongoing risk posed by natural disasters (Shaw, 2016).

Technological advancements further contribute to curriculum disruptions. The rapid evolution of digital technologies necessitates continual updates to educational content and teaching methodologies. Integrating digital tools and platforms into early childhood education while enhancing learning opportunities often requires substantial curricular adjustments. This constant need for adaptation can disrupt established educational practices and structures (Selwyn, 2016; Fullan, 2020). Additionally, the increasing reliance on technology during the COVID-19 pandemic has accelerated the adoption of digital learning, highlighting the need for resilient curricula that seamlessly integrate technological advancements (Dhawan, 2020).

Socio-political changes, including policy reforms, economic crises, and political instability, are critical in curriculum disruptions. Educational policy shifts, driven by government or educational leadership changes, often necessitate significant curricular revisions. For example, implementing new educational standards or reforms can disrupt existing curricula and require extensive retraining of educators (Burbules & Torres, 2000; Darling-Hammond et al., 2020). Economic factors, such as recessions or budget cuts, can further exacerbate these disruptions by limiting resources available for curricular development and implementation. The economic downturn caused by the COVID-19 pandemic has strained educational budgets globally, forcing schools to make difficult choices that impact curricular offerings (Levin, 1998; Belfield, 2020).

Health crises, particularly pandemics, have a profound impact on educational continuity. The COVID-19 pandemic has been a stark reminder of the potential for health crises to cause significant curriculum disruptions. Schools worldwide had to pivot to remote learning almost overnight, exposing gaps in digital infrastructure and preparedness (Bozkurt et al., 2020; Reimers & Schleicher, 2020). This transition highlighted the importance of flexible and adaptable curricula that can withstand such disruptions and continue to provide quality education under challenging circumstances.

Globalization and cultural changes further contribute to the inevitability of curriculum disruptions. As societies become increasingly interconnected, there is a growing need for curricula that reflect global perspectives and multicultural education. This ongoing process of curricular revision to incorporate global and cultural competencies can disrupt established educational practices (Spring, 2008; Banks, 2015). Moreover, the rise of international benchmarks and assessments, such as the Programme for International Student Assessment (PISA), pressures national education systems to continually adapt their curricula to meet global standards (OECD, 2019). Various natural disasters, technological advancements, socio-political changes, economic factors, health crises, and globalization drive disruptions in education. Hence, **Axiom 3, "In implementing the curriculum, disruptions are inevitable due to various factors."**

Curriculum resilience, adapting and thriving in adversity, is crucial for maintaining educational continuity during disruptions. In early childhood education contexts, resilience involves the ability of educators, institutions, and curricula to navigate interruptions and emerge stronger effectively (Masten, 2014). This concept is particularly relevant in today's unpredictable educational landscape, where disruptions such as pandemics, natural disasters, or socio-economic challenges can significantly impact learning processes.

Recent global events, notably the COVID-19 pandemic, have highlighted the need for curriculum adaptation and resilience during disruptions. Samuelsson et al. (2020) examined how preschools in Norway, Sweden, and the United States adapted their curricula during the pandemic. They found that resilient curricula were characterized by flexibility, a focus on holistic child development, and strong partnerships between educators and families. These adaptable curricula allowed for continuity of learning even when traditional classroom settings were disrupted, demonstrating the importance of built-in resilience in curriculum design.

Furthermore, Kim (2020) investigated student teachers' experiences in early childhood education during the pandemic, finding that resilient curricula incorporated digital technologies and innovative pedagogical approaches to maintain engagement and learning outcomes. This underscores the importance of adaptability and technological integration in building curriculum

resilience, allowing for swift transitions between in-person and remote learning modalities when necessary.

Darling-Hammond and Hyler (2020) emphasize the importance of incorporating protective factors into curriculum design to enhance resilience. These factors include supportive relationships, access to resources, and opportunities for positive social interactions. In the context of curriculum interruptions, such protective factors can help buffer the negative impacts of disruptions on children's learning and development.

Integrating social-emotional learning (SEL) into curricula has also enhanced resilience during disruptions. Yoder et al. (2020) found that incorporating SEL into distance learning curricula helped maintain student engagement and emotional well-being during school closures. This suggests that curricula designed focusing on academic content and social-emotional skills are better equipped to support children through periods of educational disruption.

Research by Reimers and Schleicher (2020) on global responses to educational disruptions during the pandemic further highlighted the importance of curriculum adaptability. They found that education systems with flexible curricula that could be easily modified for remote or hybrid learning were more successful in maintaining educational continuity. This underscores the need for curriculum designs that are inherently adaptable and can be quickly adjusted in response to various types of disruptions. Hence, **Axiom 4** states, "**During disruptions, curriculum adaptation, and resilience are needed."**

Formulated Propositions

Proposition 1: An early childhood education curriculum that focuses on essential knowledge and skills for learners is resilient to disruptions.

This proposition emerges from the understanding that a well-planned curriculum is crucial for children's development (Axiom 1), disruptions are inevitable (Axiom 3), and curriculum adaptation is necessary during such disruptions (Axiom 4). A curriculum maintains its core objectives even in challenging circumstances by focusing on essential knowledge and skills. This focus ensures that fundamental learning continues despite potential delivery methods or resource limitations. For instance, during the COVID-19 pandemic, early childhood programs that prioritized essential skills like literacy and numeracy were better able to maintain educational continuity in remote learning settings (Kim, 2020). As Samuelsson et al. (2020) noted, resilient curricula during the pandemic focused on holistic child development, demonstrating how an emphasis on essential skills contributes to curriculum resilience.

Proposition 2: An early childhood education curriculum that is flexible in design and delivery is resilient to disruptions.

This proposition is deduced from the importance of a well-planned curriculum (Axiom 1), the inevitability of disruptions (Axiom 3), and the need for curriculum adaptation (Axiom 4). A flexible curriculum can be quickly modified to suit changing circumstances without compromising its core educational goals. This adaptability allows for integrating various teaching methods, technologies, and resources as needed. For example, Darling-Hammond and Hyler (2020) found that curricula designed with built-in flexibility were more successful in maintaining educational continuity during school closures. Flexibility in design and delivery

becomes a vital feature of a resilient curriculum, enabling it to maintain its effectiveness and relevance despite unexpected disruptions. Reimers and Schleicher (2020) observed that education systems with flexible curricula that could be easily modified for remote or hybrid learning were more successful in maintaining educational continuity during the pandemic.

Proposition 3: An early childhood program with strong parent-teacher collaboration contributes to curriculum resilience during disruptions.

This proposition is logically derived from the importance of stakeholder involvement (Axiom 2) and the need for curriculum adaptation during disruptions (Axiom 4). Strong parent-teacher collaboration creates a supportive network that helps maintain educational continuity during challenging times. This collaboration allows for shared responsibility in implementing the curriculum at school or home and facilitates quick adaptation to new learning environments. O'Connor et al. (2022) found that when schools actively involve parents in curriculum-related decisions, it leads to increased parental engagement and better support for children's learning at home. Furthermore, Samuelsson et al. (2022) observed that preschools with solid partnerships with parents could better adapt their curricula to remote and hybrid learning contexts during the pandemic, ensuring continuity of education during disruptions.

Proposition 4: Professional development for educators contributes to curriculum resilience.

This proposition is connected to the importance of a well-planned curriculum (Axiom 1) and the need for curriculum adaptation during disruptions (Axiom 4). Professional development equips educators with the knowledge, skills, and adaptability needed to effectively implement and modify the curriculum in response to various challenges. By continually updating their pedagogical approaches and understanding of child development, educators become better prepared to navigate disruptions while maintaining the integrity of the curriculum. Markussen-Brown et al. (2023) found that professional development for early childhood educators significantly improved their language and literacy practices, demonstrating how ongoing learning enhances curriculum implementation. Moreover, Hu et al. (2022) emphasized that robust professional development programs enable educators to effectively implement curriculum plans, ensuring that the benefits of a well-designed framework reach every child in the classroom, even during challenging times.

DISCUSSION AND IMPLICATIONS

Theory

The Disruption-Resiliency Continuum Theory provides a framework for understanding and developing resilient early childhood education systems. Rather than viewing resilience as a reactive capacity that emerges during crisis, this theory conceptualizes it as a proactive capability that can be systematically developed through the dynamic interaction of three core components: essential knowledge, skills and values; adaptive design and delivery; and systemic support. The theory suggests that true resilience emerges when these components are deliberately integrated and mutually reinforcing.

The first component is essential knowledge skills and values which represent the foundational educational priorities that must be preserved during any disruption. This component addresses the critical gap in maintaining developmental appropriateness during

disruptions by explicitly integrating both universal child development domains and culturally-specific learning priorities. Universal developmental domains encompass the research-validated areas critical for early learning: cognitive development, social-emotional growth, physical development, and language acquisition. For instance, a preschool implementing this component would begin by conducting a comprehensive curriculum audit to identify non-negotiable priorities like foundational literacy skills, emotional self-regulation, and community cooperation. Teachers would then develop specific indicators to measure these elements through tools like developmental assessments, observational documentation, and progress monitoring. Crucially, this component also incorporates culturally-specific learning priorities, acknowledging that effective early childhood education must be culturally responsive and community-relevant.

The second component is the adaptive design and delivery component that addresses the gap in systematic approaches to maintaining educational continuity during disruptions. This component builds on organizational adaptation theory but extends it specifically for early childhood contexts through three key mechanisms. Structural flexibility enables programs to reorganize their physical and organizational elements while maintaining developmental appropriateness, such as creating learning environments that can transition between in-person and remote delivery. Process modularity involves designing educational experiences in adaptable units that can be modified or recombined based on circumstances without losing pedagogical effectiveness. Resource flexibility focuses on developing versatile approaches to deploying educational materials, staff capabilities, and support services. Together, these mechanisms enable programs to maintain essential functions while adapting to changing conditions.

The third component is systemic support which represents the integrated networks of relationships and resources that enable both preservation of essential elements and successful adaptation. This component addresses the fragmentation in existing approaches by showing how various support elements must work together systematically. It operates through three interconnected domains: interpersonal relationships that provide social capital and enable knowledge sharing, resource networks that ensure access to necessary materials and services, and institutional structures that create the policies and practices supporting resilient operations. For example, programs would establish multi-modal communication systems with families, develop resource-sharing partnerships with community organizations, and create flexible policies that support rapid adaptation while maintaining quality standards.

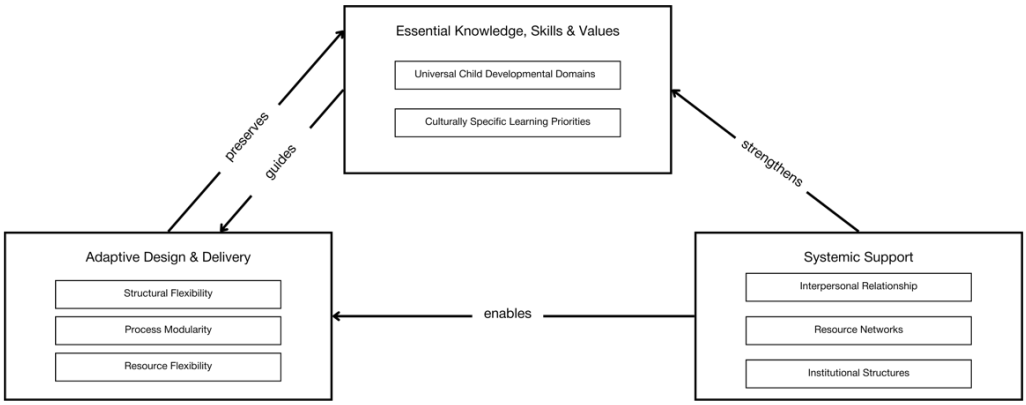
The theory proposes several key relationships between these components. First, the effectiveness of adaptive design and delivery depends on clearly defined essential knowledge, skills and values - programs can only adapt successfully if they know what must be preserved. Second, systemic support enables both the maintenance of essential elements and the implementation of adaptive strategies. Third, successful adaptation reinforces support systems by demonstrating their value and building trust among stakeholders. These relationships create virtuous cycles that strengthen overall system resilience over time.

This theoretical framework advances our understanding by explaining not just what makes early childhood programs resilient, but how resilience can be systematically developed through intentional design and implementation. It provides clear guidance for practitioners while remaining flexible enough to accommodate different contexts and resources. By integrating previously fragmented elements into a coherent whole, it enables more comprehensive approaches to building educational resilience. The framework's emphasis on

dynamic interaction helps leaders understand how changes in one area affect others, supporting more effective decision-making during both normal operations and disruptions.

Figure 1

The Disruption-Resiliency Continuum Theory in Developing Resilient ECE Curriculum



The diagram illustrates the Disruption-Resiliency Continuum Theory for Early Childhood Education. At the top-center of the framework is "Essential Knowledge, Skills and Values," which comprises two key elements: Universal Child Development Domains and Culturally-Specific Learning Priorities. This central component serves as a bridge between the other two components, emphasizing its role as the core foundation that must be preserved and enhanced during disruptions.

On the right side of the diagram is "Systemic Support," which encompasses three vital elements: Interpersonal Relationships, Resource Networks, and Institutional Structures. This component represents the foundational support systems that enable resilience through multiple scales of interaction and resource provision. The positioning of this component illustrates its role in strengthening the core elements while simultaneously enabling adaptive capabilities.

The left side of the diagram depicts "Adaptive Design and Delivery," consisting of three key elements: Structural Flexibility, Process Modularity, and Resource Flexibility. This component demonstrates the system's capacity to modify its operations while maintaining essential functions. Its position shows how it receives guidance from the core components while working to preserve them during disruptions.

The relationships between these components are illustrated through directional arrows, showing the dynamic interactions within the system. Systemic Support strengthens the Essential Knowledge, Skills and Values while enabling Adaptive Design and Delivery. In turn, Adaptive Design and Delivery preserves the core elements, while these core elements guide the adaptive processes. This interconnected flow demonstrates how each component contributes to and reinforces the others, creating a continuous cycle of resilience-building.

CONCLUSION

The Disruption-Resiliency Continuum Theory presents a framework integrating three components in early childhood education: Essential Knowledge, Skills and Values as the core element between Systemic Support and Adaptive Design and Delivery. This framework conceptualizes resilience as a developmental capability rather than a fixed trait, providing a foundation for system design and improvement. The theory addresses both developmental domains and cultural priorities across contexts while offering implementation strategies. The interaction between support systems strengthening core priorities, and adaptive capabilities preserving essential elements during disruptions, establishes pathways to system resilience. This theory advances the understanding of educational resilience while providing leaders with insights to build systems that deliver consistent educational experiences, supporting child development through various circumstances.

Future Directions

As ways forward, it is recommended that this theory be validated. Future research should prioritize empirically validating the Disruption-Resiliency Continuum Theory through systematic mixed-methods studies across diverse early childhood settings. While the theory provides a comprehensive framework integrating essential knowledge, adaptive capacity, and systemic support, its practical implementation needs rigorous evaluation. Longitudinal studies would be particularly valuable to assess how the theorized relationships between components manifest during actual disruptions and how they contribute to maintaining developmental appropriateness and learning continuity. The theory's applicability may be constrained by contextual factors like resource availability, cultural differences, and regulatory environments - understanding these boundary conditions is critical. Key research priorities include: developing validated metrics for assessing the strength of each component and their interactions; examining how the balance between preserving essential elements and enabling adaptation varies across different types of disruptions; investigating how digital technologies can support resilience while maintaining developmental appropriateness; and studying how the framework may need modification for different age groups within early childhood education. Additionally, research should explore potential biases in how essential knowledge and skills are defined across different cultural contexts, and how power dynamics within support systems may influence adaptation processes. Understanding the resource requirements and cost-effectiveness of implementing the framework's components will also be crucial for practical adoption. These research directions will help refine the theory while building evidence for its utility in supporting resilient early childhood education systems.

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CONFLICTS OF INTEREST

The author declares that there are no conflicts of interest regarding the publication of this study.

AUTHOR CONTRIBUTIONS

The author was responsible for the conception and design of the study, data collection, data analysis, interpretation of the findings, and preparation of the manuscript.

DECLARATION OF GENERATIVE AI USE

No generative artificial intelligence (AI) tools were used in the design, data collection, analysis, interpretation of the findings. The author used Claude to enhance the readability of the manuscript. The author then reviewed the enhancement made and takes full responsibility in the content of the data.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the author upon reasonable request.

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