



Developing 21st-century skills in preschool children: A review

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Abstract

The development of 21st-century skills in preschool children is crucial for preparing them to navigate the complexities of an increasingly interconnected and rapidly evolving world. These skills—spanning cognitive, interpersonal, and intrapersonal domains—include critical thinking, creativity, problem-solving, collaboration, communication, self-regulation, adaptability, and resilience. This review paper explores the importance of fostering these skills during the preschool years, a critical period for early cognitive and socio-emotional development. Through an examination of play-based learning, socio-emotional learning (SEL) programs, technology integration, and inquiry-based approaches, the paper highlights effective strategies for supporting the development of 21st-century skills in young children. It also addresses the challenges of implementing these strategies, including the need for teacher training, equitable access to resources, and balancing academic and skill-based learning. Ultimately, the paper underscores the significance of preschool education in shaping well-rounded individuals who are equipped to thrive in a dynamic, globalized society. By prioritizing the development of these essential skills in early childhood, educators can lay a solid foundation for lifelong learning and success.

Keywords: 21st-century skills, preschool children, socio-emotional learning (SEL)

Introduction

The rapid pace of change in the modern world, driven by advancements in technology, globalization, and shifting societal norms, has made it essential for education to evolve. Today's children will need to be equipped with skills that go beyond traditional academic knowledge. The concept of "21st-century skills" encompasses a range of abilities and competencies that are considered necessary for success in the modern world. These skills generally fall into three broad categories: cognitive skills (critical thinking, problem-solving, creativity), interpersonal skills (collaboration, communication, empathy), and intrapersonal skills (self-regulation, adaptability, resilience).

Preschool education is a critical stage in the development of these skills, as it lays the foundation for lifelong learning and success. Research shows that early childhood experiences have a profound impact on brain development and cognitive, social, and emotional growth. Given the importance of early years, it is essential to explore how 21st-century skills can be nurtured in preschool children, setting them up for future success in an increasingly complex world.

This paper reviews the literature on developing 21st-century skills in preschool children, focusing on the strategies, programs, and pedagogical approaches that can effectively foster these skills at this stage of development.

The Concept of 21st-Century Skills

In the context of education, 21st-century skills refer to a broad range of competencies that are considered essential for success in a rapidly changing, technology-driven, and globalized world. These skills extend beyond the traditional academic subjects of reading, writing, and arithmetic and encompass a broader set of abilities that enable individuals to navigate, adapt to, and thrive in the complexities of the modern world.

The idea of 21st-century skills emerged in response to the increasing pace of technological innovation, globalization, and societal changes. As economies and workplaces evolve, there is a growing need for individuals to not only possess foundational knowledge but also to be equipped with the skills required to collaborate, communicate, problem-solve, think critically, and adapt to new challenges. These skills are seen as integral to personal, academic, and professional success in today's interconnected world.

The Core Categories of 21st-Century Skills

While there are multiple frameworks for defining 21st-century skills, they are generally grouped into three broad categories: cognitive, interpersonal, and intrapersonal skills. Each category encompasses a set of specific abilities or competencies that are crucial for navigating life in the modern age.

1. Cognitive Skills

Cognitive skills are mental capabilities related to processing and applying information. These skills allow individuals to understand complex ideas, analyse information, and apply knowledge in a variety of contexts. The core cognitive skills associated with 21st-century learning include:

- **Critical Thinking:** The ability to analyse information objectively, evaluate different perspectives, and make reasoned judgments. Critical thinkers can question assumptions, identify biases, and solve complex problems using logic and evidence.
- **Problem-Solving:** The ability to identify and solve problems creatively and effectively. This involves recognizing issues, analysing the causes, and implementing innovative solutions. Problem-solving skills are essential in fields ranging from science and technology to business and social services.

- **Creativity:** Creativity involves thinking outside the box, coming up with new ideas, and adapting existing concepts in novel ways. This skill is crucial not only in artistic fields but also in technology, entrepreneurship, and any area that demands innovation.
- **Information Literacy:** The ability to access, evaluate, and use information effectively and ethically. In an age of information overload, being able to distinguish between reliable and unreliable sources and use data appropriately is vital.
- **Collaboration and Teamwork:** Although more closely related to interpersonal skills, collaboration also requires cognitive abilities such as strategic thinking, coordination, and problem-solving in group settings.

2. Interpersonal Skills

Interpersonal skills, also known as soft skills or people skills, involve the ability to interact effectively with others. These skills are increasingly critical as work environments become more diverse, team-based, and collaborative. The key interpersonal skills for the 21st century include:

- **Communication:** The ability to convey ideas and information clearly and effectively, both in speaking and writing. This includes the ability to listen actively, present ideas persuasively, and engage in constructive dialogue. With the rise of virtual communication tools (e.g., email, video conferencing, social media), strong communication skills are vital for success in both personal and professional settings.
- **Collaboration:** The ability to work effectively in diverse teams, often with people from different backgrounds, cultures, and expertise. Collaboration involves negotiation, flexibility, and empathy, and the ability to contribute to group efforts while respecting others' perspectives.
- **Empathy:** The ability to understand and share the feelings of others. Empathy is important for building strong relationships, resolving conflicts, and working harmoniously in teams. It fosters emotional intelligence, which is essential for leadership and creating inclusive environments.
- **Conflict Resolution:** The ability to manage and resolve disagreements constructively. In a diverse world, conflicts are inevitable, but the ability to navigate them in a respectful and solution-oriented manner is key for maintaining positive relationships and a productive work environment.
- **Cultural Competence:** The ability to interact effectively with people from diverse cultures, backgrounds, and beliefs. As globalization connects people from all over the world, cultural competence is becoming increasingly important for both personal and professional success.

3. Intrapersonal Skills

Intrapersonal skills are those that relate to the individual's ability to manage their own thoughts, emotions, and behaviours. These skills help individuals adapt to challenges, set and achieve personal goals, and maintain a healthy sense of self-awareness. The intrapersonal skills most associated with 21st-century competencies include:

- **Self-Regulation:** The ability to manage one's emotions, behaviours, and impulses in different situations. Self-regulation includes patience, delayed gratification, and

the ability to stay focused and persistent when working toward long-term goals. This skill is important for personal well-being, academic success, and professional growth.

- **Adaptability and Flexibility:** The capacity to adjust to changing circumstances, learn from new experiences, and remain open to new ideas. In an ever-evolving world, being adaptable is essential for navigating technological changes, new job roles, and unforeseen challenges.
- **Resilience:** The ability to bounce back from setbacks and persevere through difficulties. Resilience involves maintaining a positive attitude in the face of adversity and continuing to strive toward goals despite challenges.
- **Growth Mindset:** The belief that abilities and intelligence can be developed with effort, practice, and learning. People with a growth mindset embrace challenges, seek feedback, and are motivated to improve, which helps them succeed in various aspects of life.
- **Time Management and Organization:** The ability to prioritize tasks, manage time effectively, and stay organized. With the increasing demands of modern life and work, these skills are essential for maintaining productivity and well-being.

The Role of Technology in 21st-Century Skills

Technology plays a pivotal role in the development and application of 21st-century skills. As technology continues to reshape industries and societies, the ability to use digital tools and platforms is increasingly seen as a key competency.

- **Digital Literacy:** In addition to traditional literacy skills, digital literacy has become a cornerstone of 21st-century education. Digital literacy encompasses the ability to find, evaluate, and communicate information using technology, as well as understanding its ethical implications.
- **Media Literacy:** As people are bombarded with information from various digital platforms, media literacy — the ability to critically assess media messages and identify biases or misinformation — has become crucial.
- **Collaborative Technologies:** Tools such as Google Docs, project management software, and communication platforms (e.g., Zoom) are integral in supporting collaboration and teamwork in both educational and professional environments.

The Importance of 21st-Century Skills for Future Success

The demand for 21st-century skills in education, workplaces, and society reflects the evolving nature of the challenges people face. In an era of rapid technological change, increased connectivity, and globalization, these skills are essential not just for surviving, but for thriving. Here are some key reasons why these skills are critical:

1. **Workplace Readiness:** As automation and artificial intelligence (AI) reshape industries, the ability to think critically, collaborate, and solve complex problems will differentiate workers. Many jobs today require skills that go beyond technical expertise and focus on collaboration, communication, and creativity.

2. **Global Citizenship:** In an interconnected world, the ability to work across cultures, communicate with people from diverse backgrounds, and address global challenges such as climate change, poverty, and inequality is vital for creating a more inclusive and sustainable future.
3. **Personal Growth and Adaptability:** The world is changing at a rapid pace, and individuals who possess strong intrapersonal skills like resilience, adaptability, and a growth mindset are better equipped to navigate uncertainty, manage change, and continue learning throughout their lives.
4. **Technological Innovation:** As technology continues to evolve, the need for individuals to understand, create, and adapt to new digital tools and systems will become increasingly important. Digital literacy, coding skills, and the ability to use emerging technologies are no longer just for tech professionals but for individuals in every field.

The concept of 21st-century skills reflects the changing demands of the modern world. These skills extend beyond traditional academic knowledge and are essential for success in a rapidly evolving global society. Cognitive, interpersonal, and intrapersonal skills, supported by technology and a commitment to lifelong learning, are key to preparing individuals for future challenges and opportunities. Education systems around the world are increasingly focusing on developing these competencies in learners at all ages, starting with early childhood education and continuing through adulthood, to ensure that individuals are equipped to navigate the complexities of the 21st century with confidence and competence.

Why Preschool is Critical for Developing 21st-Century Skills

Preschool, typically for children between the ages of 3 and 5, is a critical stage in a child's development because it provides the foundation for many cognitive, social, emotional, and physical skills that children will continue to build upon throughout their lives. The importance of preschool in developing 21st-century skills cannot be overstated, as this is the period when children's brains are highly receptive to learning and when they begin to acquire the foundational abilities that will shape their future success. In particular, the development of cognitive, socio-emotional, and intrapersonal skills during the preschool years is crucial for preparing children to thrive in a complex, fast-changing world.

Preschool is critical for developing 21st-century skills for the following reasons:

1. Brain Development and Early Learning

The early years, from birth to age five, are a time of rapid brain development. According to research in neuroscience, the brain forms connections at an astounding rate during this period. Early experiences, particularly those that involve cognitive, social, and emotional stimulation, have a lasting impact on brain architecture and learning capabilities. The foundation for later learning is built during these years, and this period of development is crucial for fostering the cognitive skills (e.g., critical thinking, problem-solving, creativity) and socio-emotional skills (e.g., self-regulation, empathy, collaboration) that are integral to success in the 21st century.

Preschool education provides a structured environment in which children can engage in activities that promote cognitive growth, such as:

- **Problem-solving:** Through hands-on activities like puzzles, games, or simple science experiments, children learn how to think critically, reason, and approach challenges in a systematic way.
- **Language development:** Early language skills, including vocabulary and communication, are vital for learning and collaboration in later years. The ability to express ideas clearly and listen effectively forms the foundation for both academic and social success.

Because the brain is most malleable at this age, positive, enriching experiences in preschool directly impact a child's ability to acquire and apply 21st-century skills throughout their life.

2. Building Emotional and Social Skills

The preschool years are also a critical time for the development of **socio-emotional skills**, which are essential for effective collaboration, communication, and resilience. These skills are foundational for building relationships, navigating social dynamics, and managing one's emotions—all of which are vital in the interconnected, globalized world of the 21st century.

- **Self-regulation:** Preschool is when children begin to develop the ability to control their impulses, regulate their emotions, and practice patience. Self-regulation is a key **intrapersonal skill** that is essential for academic success and personal well-being. It helps children manage stress, focus attention, and persist through challenges—skills that are invaluable in school and in the workplace.
- **Empathy and Social Skills:** Children in preschool learn how to interact with peers, share, take turns, and resolve conflicts. These interactions help foster **empathy**—the ability to understand and respond to the feelings of others. Empathy is a vital social skill, particularly in a diverse, globalized world, where understanding and respecting different perspectives is increasingly important.
- **Collaboration and Teamwork:** Through group activities and play, preschoolers learn to cooperate, negotiate, and work together toward common goals. These **interpersonal skills** are key to thriving in team-oriented environments in both school and future workplaces.

These socio-emotional skills provide a strong foundation for success in the 21st century, where collaboration, communication, and emotional intelligence are often more important than technical expertise alone.

3. Fostering Creativity and Problem-Solving

One of the core components of 21st-century skills is creativity—the ability to think outside the box and come up with innovative solutions to complex problems. Creativity isn't something that is limited to the arts; it is a vital skill in every field, from science and technology to business and social entrepreneurship.

- In preschool, children engage in play-based learning activities that encourage imagination and creativity. For example, when children use blocks to build structures

or create art with different materials, they learn how to experiment, make decisions, and approach problems from different angles. These experiences foster critical thinking and creativity—skills that children will continue to build upon in their academic and personal lives.

- Problem-solving and critical thinking are also developed through play and exploration. When children encounter challenges in play (such as figuring out how to fit pieces into a puzzle or how to balance a stack of blocks), they develop important problem-solving skills. These skills will later help them approach academic tasks, professional challenges, and even personal decisions with creativity and resilience.

4. Promoting Adaptability and Resilience

In a rapidly changing world, the ability to adapt to new circumstances and bounce back from setbacks is essential. Preschool provides the opportunity for children to develop these intrapersonal skills, which are vital for thriving in uncertain and challenging environments.

- **Adaptability** in preschool might be learned when children are exposed to new situations—such as adjusting to a new classroom routine or interacting with new peers. Children begin to learn that change is a natural part of life, and the ability to adjust helps them develop resilience.
- **Resilience** is also developed as children face small challenges, such as learning to tie their shoes, solve a problem in play, or overcome a fear (such as trying something new). These early experiences with overcoming difficulty help children understand that setbacks are part of learning, and that perseverance is key to success.

Fostering adaptability and resilience in preschoolers prepares them to cope with the demands of the 21st-century world, which is characterized by constant change, technological advancement, and evolving job markets.

5. Preparing for the Digital World

The digital age requires children to develop digital literacy, which refers to the ability to use technology effectively and ethically. Even at the preschool level, introducing basic digital tools and concepts can help children develop an understanding of how to engage with technology in positive and productive ways.

- **Technology Integration:** Although preschoolers are not yet expected to be fully tech-savvy, early exposure to educational apps, interactive games, and digital storytelling can help them understand how technology can be used as a tool for learning. Through age-appropriate use of technology, children can begin to develop foundational skills in using devices, navigating digital content, and engaging with learning platforms.
- **Problem-Solving with Technology:** Simple digital tools and interactive games can also foster problem-solving, critical thinking, and creativity. For example, a child using a drawing app or an educational game may engage in tasks that require logical thinking or creative expression, reinforcing these 21st-century skills.

While it is important to balance screen time with physical and social activities, early engagement with technology

prepares children to navigate the increasingly digital world with confidence.

6. Establishing Lifelong Learning Habits

Finally, preschool plays a critical role in setting the stage for lifelong learning. One of the key aspects of 21st-century success is the ability to continually acquire new knowledge and adapt to new situations. Preschool education encourages curiosity, exploration, and a love of learning—qualities that will serve children throughout their academic careers and into adulthood.

- Preschool encourages children to ask questions, explore their surroundings, and seek out new experiences. This curiosity-driven approach fosters a love for learning that can continue throughout life.
- Learning through play, exploration, and real-world experiences instills in children a sense of agency and ownership over their learning, empowering them to become lifelong learners.

Preschool is critical for developing 21st-century skills because it provides the first structured environment in which children can engage in activities that build cognitive, socio-emotional, and intrapersonal skills. These early experiences lay the foundation for creativity, problem-solving, collaboration, adaptability, and resilience—skills that are essential for navigating a rapidly changing world. By nurturing these skills at a young age, preschool helps set children on a path toward lifelong success, preparing them not just for school, but for life in the interconnected, digital, and constantly evolving world of the 21st century.

Key Strategies for Developing 21st-Century Skills in Preschool

A. Play-Based Learning

Play is widely recognized as a crucial vehicle for developing 21st-century skills in preschool-aged children. Through play, children engage in activities that encourage exploration, creativity, problem-solving, and social interaction. For instance:

- **Cognitive Skills:** Activities such as building with blocks, solving puzzles, or engaging with educational toys foster critical thinking and creativity. These types of play allow children to experiment with concepts like cause and effect, spatial awareness, and problem-solving.
- **Socio-Emotional Skills:** Group play fosters cooperation, communication, empathy, and negotiation. Preschoolers learn to take turns, share, and resolve conflicts with peers, which helps them build interpersonal skills.
- **Language Development:** Play also supports language skills, as children describe their actions, ask questions, and engage in imaginative storytelling.

B. Socio-Emotional Learning (SEL) Programs

Research indicates that socio-emotional learning (SEL) programs are highly effective in promoting self-regulation, empathy, and positive peer relationships. For example, integrating SEL into daily routines by helping children label emotions, practice coping strategies, and understand the perspectives of others goes a long way in relating to each other.

- **Emotional Regulation:** Teaching preschoolers to manage their emotions is essential for later success in both school and life. Children who can regulate their emotions are better equipped to handle stress, adapt to new situations, and build resilience.
- **Conflict Resolution:** Programs that teach conflict resolution strategies help children navigate disagreements with peers in a constructive manner, laying the foundation for strong interpersonal relationships in the future.

C. Technology Integration

In the 21st century, children are increasingly interacting with technology from a very young age. While concerns about screen time and its potential impact on development are valid, when used thoughtfully, technology can enhance learning and the development of 21st-century skills.

- **Interactive Apps and Games:** Educational apps designed for preschoolers can promote problem-solving, creativity, and collaboration. Apps that involve storytelling, puzzles, and games that encourage critical thinking can help preschoolers develop key cognitive skills.
- **Digital Literacy:** Introducing children to basic digital skills, such as using tablets or computers for educational purposes, can support their ability to navigate the digital world later in life.

However, the key is moderation and the selection of high-quality content that supports developmental goals rather than replacing hands-on or face-to-face experiences.

D. Inquiry-Based Learning

Inquiry-based learning emphasizes curiosity and exploration, where children's natural interests guide their learning. In preschool, this can involve encouraging children to ask questions, explore new concepts, and engage in experiments or investigations. For example:

- **Hands-On Activities:** Simple science experiments, nature walks, or art projects where children are encouraged to hypothesize, test ideas, and reflect on outcomes promote critical thinking and problem-solving.
- **Questioning Techniques:** Teachers can model inquiry-based learning by asking open-ended questions that stimulate children's thinking and encourage them to explain their reasoning.

Challenges and Considerations

While there is broad agreement on the importance of fostering 21st-century skills in preschool children, there are several challenges to implementing these strategies effectively.

- **Teacher Training:** Educators need professional development to understand the nuances of developing these skills in young children. Many preschool teachers may not be trained in methods like inquiry-based learning or SEL, which can make implementation difficult.
- **Access to Resources:** Not all preschools have the resources to provide play-based learning environments or integrate technology into their curricula. Inequities in early childhood education access and quality can limit opportunities for some children.

- **Balancing Academics and Skills:** In some educational systems, there may be pressure to focus on academic achievement (e.g., early literacy and numeracy) at the expense of developing broader skills. Striking a balance between academic learning and the development of social, emotional, and cognitive skills is essential.

Conclusion

The development of 21st-century skills in preschool children is essential for preparing them to thrive in a rapidly changing world. By fostering cognitive, interpersonal, and intrapersonal skills through play, social-emotional learning, technology integration, and inquiry-based approaches, educators can provide a strong foundation for lifelong learning and success. Although challenges exist, the growing recognition of the importance of early childhood education and the evolving understanding of how to support young learners suggests that there is significant potential for improving preschool practices to better meet the needs of today's children.

Future research should continue to explore the effectiveness of various pedagogical strategies for developing 21st-century skills in preschool settings and examine how best to support both educators and children in this endeavour.

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