

The Obstacles and Paths of Family Education Concepts and Cognition to Promote the Development of Digital Education

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Abstract: The transformative growth of digital education has highlighted its potential to revolutionize learning, yet it faces notable challenges, particularly concerning the role of family education. Families are critical in supporting students in digital learning, but generational gaps, cultural attitudes, and cognitive lags often hinder the effective adoption of digital tools. This article explores the intersection of family education concepts and digital learning, emphasizing the obstacles families face. Through a comprehensive analysis, the study identifies key barriers, including extreme attitudes toward digital education and the cultural and generational gaps that limit parental engagement. It also evaluates the pivotal role of family involvement in aligning with modern educational demands. Based on these findings, the article proposes actionable strategies: increasing family awareness through training, fostering home-school collaboration, encouraging balanced use of traditional and digital methods, and developing policies that address socioeconomic barriers. These approaches aim to bridge gaps in family education and promote equitable digital learning opportunities. By integrating family education practices with the changing requirements of digital education, this study emphasizes the need for family involvement in building a supportive and inclusive educational ecosystem.

Keywords: Family Education, Digital Learning, Generational Gaps, Parental Involvement

1. Introduction

The rapid development of digital education has brought transformative possibilities and challenges to the global education sector. Digital education covers online platforms, interactive applications, and technology-enhanced teaching. The expansion of digital education has changed the traditional education landscape and has received widespread attention across all age groups and educational settings [1,2]. Education systems need to consider not only using technology to facilitate learning and teaching, enhance flexibility and personalized learning opportunities, but also prepare students to thrive in a technology-driven world [3]. By leveraging technologies such as artificial intelligence (AI), learning management systems, and data analytics, learners can be supported to learn adaptively and develop key digital skills in digital literacy, problem-solving, and collaboration [4].

As families become increasingly involved in guiding and supporting children's digital learning, family education plays a vital role in shaping young learners' engagement and effectiveness in using these tools. From early childhood to advanced learning, digital education brings new dimensions to pedagogy and learning environments, enabling students to access a wealth of information and engage

in personalized learning experiences [5]. Families' concepts and perceptions of education directly influence how they engage and support their children's digital education programs [6,7]. For digital education to reach its potential, family education philosophies must align with the needs of the digital learning ecosystem [8].

However, several barriers may hinder this alignment, stemming from factors such as generational gaps in digital literacy, stereotypes, and different cultural attitudes toward the use of educational technology [9]. The challenges between family education practices and digital learning paradigms are largely due to differences in technology access, generational gaps in digital literacy, and different attitudes toward traditional and digital pedagogies. Strong cooperation and support from the family education system plays a key role in shaping learners' cognitive, emotional, and academic growth. Combining homeschooling with the demands of an increasingly digital learning environment, critical exploration reveals barriers rooted in traditional values and potential pathways for integrating digital practices into homeschooling approaches.

Many families still have difficulty integrating new demands related to digital technology into existing educational concepts and practices. To understand the limitations of family education in promoting digital learning, it is necessary to study parents' attitudes and cognitive frameworks towards digital tools. The effectiveness of digital education depends largely on family involvement, parental attitudes, and the consistency of family and school expectations, which are often influenced by the family's digital literacy, socioeconomic status, and access to resources [10].

This study aims to provide innovative ways to promote family involvement in digital tools, bridging the gap between traditional family education and modern digital learning needs. Support the resources and knowledge needed for children's digital learning journey, thereby promoting more equitable educational opportunities. Evaluate the framework for family involvement in digital education and gain insight into how family education practices can develop in a way that is conducive to traditional and digital learning models.

2. Characteristics and Development Status of Digital Education

Digital education has become a transformative force in modern learning, reshaping the education landscape through innovative technologies and teaching methods. Using technology to create a more accessible, personalized, and effective learning environment, improves accessibility, flexibility, and learning outcomes. And in a special period, the application of technology has become a hard requirement. It has made technicians and the education system focus on the relatively backward technical teaching. After the world recovered, digital education has also developed "in great strides" and has been widely used at a rapid pace.

2.1. Current Trends and Technologies

Digital education is a transformative force that leverages cutting-edge technology to redefine teaching and learning processes. By integrating tools, platforms, and methods such as online learning platforms, AI-driven systems, and immersive technologies, digital education enhances accessibility and personalizes the learning experience. It also harnesses data analysis to refine teaching strategies and improve outcomes, creating a flexible and inclusive educational landscape [8].

Software applications serve as essential tools for delivering, managing, and personalizing education. Online learning platforms are essential components of digital education. Tools like Zoom have emerged as pivotal during the COVID-19 pandemic, ensuring the continuity of education amidst physical disruptions [11]. Platforms like Moodle and Google Classroom have become indispensable tools for enabling virtual classrooms, resource sharing, and communication. They foster interactive collaboration and enable educational continuity during disruptions [5]. Artificial intelligence(AI)

revolutionizes digital education by enabling personalized learning experiences. AI-driven systems analyze individual student performance, adapting content to meet unique learning needs. This approach boosts engagement, optimizes efficiency, and addresses diverse student preferences, making learning more dynamic and student-centric [4]. Applications provide interactive and gamified learning experiences, particularly for younger audiences, combining education with entertainment.

Hardware innovations form the backbone of digital education, enabling the implementation of various technologies. Robust infrastructure supports online learning platforms, ensuring seamless access and connectivity for educational resources. Interactive Devices like tablets, interactive whiteboards, and digital pens facilitate dynamic and participatory learning experiences. These devices create tactile and visual engagement, making abstract concepts more accessible. Immersive technologies like virtual reality (VR) and augmented reality (AR) enrich the learning process by providing engaging, interactive experiences. These tools help students visualize abstract concepts and participate in simulated environments, fostering deeper understanding and enthusiasm for learning [3]. Additionally, digital simulations reduce the need for real-world materials, promoting sustainability and reusability.

Big data transforms education by enabling tailored learning experiences and data-driven decision-making. Learning management systems (LMS) collect and analyze student performance data, and predict trends and potential learning challenges, helping educators identify gaps and tailor teaching strategies effectively [8]. By systematically understanding students' personalities and habits, educators can save time and effort while improving focus on specific needs.

Digital education integrates hardware, software, and big data analysis to create a comprehensive and flexible learning environment. By combining these elements, it addresses geographical, economic, and educational disparities while promoting collaborative, independent, and personalized learning. The interplay of these components not only modernizes traditional teaching models but also ensures adaptability in an ever-evolving educational landscape.

2.2. Advantages of Digital Education

Digital education offers several key advantages that reshape traditional learning methods and enhance educational outcomes in diverse ways.

Flexibility and accessibility enable students to learn according to their schedules and adapt education to their lifestyles and needs. This approach provides unmatched convenience, allowing learners to engage with content anytime and anywhere, thereby addressing barriers of time and space [2].

Global connectivity fosters cultural understanding and collaboration. Online platforms bridge geographical divides, enabling cross-cultural interactions between students and educators. These connections broaden learners' perspectives and promote critical thinking and openness in a globalized society [9].

Personalization is another hallmark of digital education. Through adaptive technologies, learning experiences can be tailored to individual needs, cultivating critical 21st-century skills such as problem-solving, collaboration, and critical thinking. These competencies are essential for thriving in the digital age [4].

Skill development is at the core of digital education's impact. Beyond imparting knowledge, it equips learners with essential abilities like collaboration, digital literacy, and problem-solving. These skills prepare students to address contemporary societal challenges and succeed in a rapidly evolving world [3].

Cost-effectiveness makes digital education an economically sustainable option. By reducing the need for physical infrastructure, institutions can deliver scalable learning solutions. For learners,

digital platforms provide affordable access to educational resources and opportunities to conduct virtual experiments safely and efficiently, lowering traditional barriers to entry [10].

Overall, these characteristics demonstrate how digital education not only enhances learning but also democratizes access, making it an indispensable tool for modern education systems.

3. Obstacles of Family Education Concepts and Cognition to Digital Education

Family education plays a key role in shaping students' digital learning experience. Inconsistency in family education concepts and cognitive frameworks poses a significant barrier to the adoption and effectiveness of digital education. These barriers stem from generational gaps, cultural attitudes, and deep-rooted stereotypes.

3.1. Cognitive Lag

One of the most common barriers is the cognitive lag of families in understanding and accepting digital education, failing to recognize the transformative impact of digital education on skill development and career opportunities. Many parents, especially those of the older generation, have difficulty keeping up with the rapid development of digital education and are unfamiliar with the core technologies and potential benefits of digital tools in modern learning environments. Without a full understanding, they may prioritize traditional educational methods [10]. They continue to associate effective education with traditional methods such as rote memorization and teacher-led teaching, viewing digital learning as a supplementary or inferior method. This cognitive lag is particularly evident in low-income families, where limited access to digital tools further exacerbates misunderstandings [5]. This gap creates doubt and hesitation, limits the support children receive at home, and thus weakens or hinders learners' ability to adapt to a technology-driven world.

Stereotypes about digital education further fuel resistance. Parents generally believe that the traditional classroom environment is more rigorous and disciplined, and digital education often leads to low learning efficiency due to the lack of teacher supervision [9]. It is undeniable that for students who are used to being managed, the self-motivated power of self-discipline is likely to be small. The implementation of fully online courses during the epidemic is also inevitable when parents, teachers, and students are completely unprepared [11]. It takes time and process to cultivate students' self-management ability. Gradually handing over some tasks from small to large to students through digital technology is one of the ways to encourage students to be independent. Digital education is a popular education. Based on experience and slower technology acquisition, parents subconsciously associate screen time with games or entertainment. They believe that digital tools distract students from their attention rather than pursuing education. There is a digital cognitive gap between the two generations in the family, leading to concerns that digital education will cover up basic skills such as writing and face-to-face communication [8,12].

While these concerns are justified, they are often based on limited knowledge and obscure the benefits of digital platforms. These stereotypes are deeply rooted in cultural and social norms, hindering families' recognition of digital learning and support for digital education, and limiting students' ability to fully embrace digital learning resources and effectively use these tools [5].

3.2. Extreme Attitudes

Polarized attitudes toward digital education pose another challenge [13]. Some families over-rely on technology, viewing it as a substitute for traditional methods and neglecting the importance of traditional learning methods. Others reject technology altogether, fearing that it will undermine basic skills and damage educational quality and moral development [8]. These extreme attitudes create an unstable learning environment, affecting students' confidence and ability to balance traditional and

digital learning methods, and making it difficult to reconcile the different expectations of school and family [8].

3.3. Cultural and Generational Gaps

Different digital literacy and generational attitudes lead to misunderstandings between parents and children. This gap is further widened by the generational gap. Older generations are unfamiliar with digital technologies and may view them as unnecessary, harmful, or overly complex [13]. Parents impose restrictions that limit students' participation in digital education, creating friction in families where children are eager to embrace and explore technology [8].

Addressing these barriers requires targeted interventions to bridge gaps in knowledge, perception, and access. Family education philosophies that align with the needs of the digital learning ecosystem can play a positive and supportive role in digital education.

4. Recommendations to Overcome Barriers

Addressing these challenges requires a multifaceted approach to promote family engagement and alignment with digital education models, overcoming barriers to family education concepts and perceptions. Families can become active participants in promoting digital education through awareness raising, policy reforms, promoting collaboration, and encouraging balance.

4.1. Family Awareness and Training

In many societies, educational success has traditionally been measured by tangible outcomes such as grades and test scores. This has led families to devalue digital tools that focus on creativity and critical thinking. Cultural norms in these societies prioritize rote learning and traditional classroom environments over innovative approaches, further limiting the integration of digital education into family practices [3]. Educational initiatives targeting families are critical to promoting acceptance and support for digital education.

Organized, regular, and informed campaigns can give parents a trustworthy first impression. Parents who must raise, educate, and protect their children will be more willing to participate in addition to work, family, and social activities. Public initiatives should highlight the role of digital tools in improving academic, learning, and career outcomes, equipping families with the knowledge to make informed decisions [6]. Make family members aware of the societal need for digital tool skills.

Parents also need to learn how to be new-age parents. A structured, structured training program can help. Workshops and online resources can familiarize parents with digital platforms, provide guidance on managing screen time, ensure safe online practices, and enable them to effectively support their children [8]. The implementation of training programs should take into account the work and life needs of parents, better integrate and arrange time, effectively educate families, and address their concerns about digital education.

Most parents' opposition to digital education comes from misunderstandings and inherent prejudices. Communicating the limitations and benefits of digital education can dispel stereotypes and build trust [10]. When parents understand that digital time is not just about games, that students need to have a balance between work and rest, and when technology is used to dispel misunderstandings and build trust, families can become more harmonious.

These programs should be adaptable to the needs of different families, ensuring access to education for all socioeconomic and cultural groups.

4.2. Policy and Support

Governments and educational institutions play a key role in promoting family engagement in digital education, ensuring that families have the resources and guidance they need to receive digital education. Therefore, policies that promote family engagement in digital education need to be planned and implemented.

Governments and educational institutions need to provide educational technology support based on regional conditions. Providing affordable devices and internet services to poor families can reduce the digital divide, especially in underserved communities [13]. Subsidize devices and internet access for low-income families to ensure that students have equal opportunities.

Build a collaborative education of the trinity of family, school, and society. Schools and policymakers should collaborate to design programs that actively involve parents in digital education planning and implementation [5]. Provide resources such as parent guides and online tutorials to help families use digital tools.

Digital education resources for parents need to be designed and developed taking into account parents' work, social, and life needs. Creating user-friendly guides and tutorials for parents to help families navigate digital platforms can enable them to use digital tools effectively and confidently [3]. By creating a supportive policy environment, governments and institutions can address socioeconomic barriers and promote inclusive digital education practices.

4.3. Promote Home-School Collaboration

Strong collaboration and strong partnerships between schools and families can align expectations and strategies to create a cohesive support system for students. Regular communication and joint action between parents and educators will promote mutual understanding and common goals.

There is often a lack of understanding between parents and schools. Some parents think that teachers assign too little homework and do not teach seriously, and also assign extra homework. Some parents think that teachers rely on a lot of homework to force students to study tiredly and do not teach seriously. Teachers will feel seriously distrusted and reduce their confidence in education. Encouraging open communication between teachers and parents, regular interaction between parents and educators can promote understanding and problem-solving, share insights, and build mutual trust [8].

The content of joint workshops should be more targeted and add information related to digital education. Collaborative sessions on digital literacy and best practices enhance alignment between families and educators and build a common understanding of the potential of digital education [6].

Parents can improve their understanding of the reasons and principles for the application of digital teaching technologies by participating in the process of customized curriculum development. Involving families in curriculum design ensures alignment and common goals in digital education culture and family values.

By promoting collaboration, a unified support system is created. Schools and families can work together to address the challenges of digital education and create a supportive environment for students to enhance their learning experience.

4.4. Encourage Balance

Families should be encouraged to adopt a balanced approach that effectively combines traditional and digital education practices. This can help students develop well-rounded skills while benefiting from the strengths of both approaches.

Use a blend of traditional and digital education as a transition and prototype. Combining online and offline activities ensures that students develop a broad range of skills and effectively reinforces

foundational skills [4]. While acquiring knowledge more efficiently, they also acquire the skills required for the development of modern technology.

Parents should take a reasonable view of students' use of digital technology based on the technical information and advice learned from training and seminars, and arrange screen time reasonably. Setting boundaries for technology use prevents overdependence and promotes healthy habits [14]. Appropriate parental supervision and communication can enhance trust and intimacy between parents and children.

Digital technology, as an intuitive, convenient, and flexible tool, can reduce students' boring and repetitive work and better explore themselves. Encourage students to use digital tools for creative projects, explore new ideas and perspectives, and develop critical thinking and innovation skills.

Balance enables students to benefit from the strengths of traditional and digital education, and develop adaptability and resilience while avoiding potential drawbacks.

5. Conclusion

The exploration of family education perceptions and cognitions reveals their critical role in promoting the development of digital education. The characteristics of digital education offer transformative potential for learners at all levels. However, several barriers posed by family education perceptions hinder its development. Families can become active participants in promoting digital education by cultivating awareness, implementing supportive policies, and promoting collaboration.

While this article analyzes barriers and solutions to integrating family education with digital education, there are certain limitations. As digital education technologies rapidly evolve, they need to be updated to accommodate emerging trends and tools. Future research should focus on evaluating the long-term impact of family involvement on digital education outcomes and exploring innovative strategies to promote collaboration between families, schools, and policymakers.

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