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Article

The Digital Age: Shaping Cognitive Skills in Kindergarteners

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Abstract: This study examines the impact of electronic device usage on young children's cognitive and social-emotional development, with a focus on foundational skills such as literacy, numeracy, memory, attention, and problem-solving. Using a descriptive research design, data were collected through structured questionnaires administered to parents and analyzed using correlation analysis to assess relationships between device usage, educational content quality, and cognitive outcomes. The results reveal that high-quality digital content significantly enhances key cognitive skills, particularly in literacy, numeracy, and problem-solving, while fostering engagement and resilience in learning tasks. Additionally, digital literacy was found to be positively associated with critical thinking and safe technology use, supporting children's readiness for a digitally-driven world. Social-emotional skills, including empathy, cooperation, and self-expression, also benefited from interactive digital tools, highlighting technology's role in holistic child development. These findings advocate for the thoughtful integration of electronic devices in early education, emphasizing balanced digital practices that nurture both cognitive and socio-emotional growth, thereby promoting comprehensive development in young learners.

Keywords: Early childhood education, Cognitive development, Digital literacy, electronic devices

Introduction

The way we live, work, and learn has been fundamentally altered by the rapid proliferation of digital technologies and the internet, which is characterized by the digital age. In the past decade, digital tools and platforms have become indispensable in a variety of daily activities, such as education, communication, and entertainment. The International Telecommunication Union (2019) reports that the availability of digital devices, including smartphones, tablets, and computers, has significantly increased, resulting in a global surge in

internet usage. This digital transformation has impacted all age groups, including young infants, as a result of the widespread access to technology (ITU, 2019). The necessity of comprehending the cognitive implications of this trend on children's cognitive development is underscored by studies conducted from 2020 to 2023, which suggest that children are engaging with digital media at progressively shorter ages (Rideout, 2020; Livingstone et al., 2021).

The cognitive abilities of kindergarteners are significantly influenced by the digital era. This process can be substantially influenced by the integration of digital tools into early education, as early childhood is a critical period for cognitive development. Research suggests that cognitive abilities in young children, including memory, attention, and problem-solving abilities, can be improved through the use of interactive digital media when implemented appropriately (Hirsh-Pasek et al., 2020; Neumann, 2020). These tools offer children the chance to participate in activities that foster cognitive development by means of interactive and engaging content. Children acquire skills that are indispensable for their academic success and cognitive development because of their exposure to digital environments (Sung & Siraj-Blatchford, 2022).

The accessibility of educational content has been considerably improved for kindergarteners as a result of the revolution in digital tools. Diverse and engaging methods for young children to access educational material are provided by tablets, educational applications, and online resources, which can accommodate a variety of learning styles and needs (Blackwell et al., 2020). These tools enable personalized and interactive learning experiences, which can enhance learning abilities by rendering complex concepts more comprehensible and pleasurable (Papadakis, 2021). Additionally, the development of digital literacy skills, which are becoming increasingly critical in the contemporary educational environment, is facilitated by early exposure to digital tools. Digital literacy is a collection of abilities, such as the capacity to effectively utilize digital tools for educational purposes, critically evaluate online content, and navigate digital environments (Hatzigianni et al., 2021).

The connection between the development of cognitive abilities in kindergarteners and digital tools is evident in numerous critical areas. For instance, educational apps designed to teach numeracy and literacy can enhance children's understanding of these fundamental skills through interactive and adaptive learning experiences (Schacter & Jo, 2020). Furthermore, through sustained engagement and active participation, interactive e-books and digital storytelling can enhance memory and attention (Bus et al., 2020). Digital puzzles and strategy games also foster the development of problem-solving skills by encouraging young minds to think critically and devise solutions (Zhang et al., 2021).Digital puzzles and strategy games also foster the

development of problem-solving skills by encouraging young minds to think critically and devise solutions (Zhang et al., 2021).

Despite the promising potential of digital tools in early childhood education, there are significant gaps in the existing research, particularly in the area of their long-term impact on cognitive development in kindergarteners. Existing literature often lacks comprehensive data on the contextual and socio-cultural factors that influence digital learning experiences and concentrates on short-term outcomes (Livingstone & Blum-Ross, 2020). Furthermore, there is a need for updated research that considers the accelerated advancement of technology and its potential impact on early childhood education. This This gap highlights the importance of ongoing research that generates contextualized, accurate information to effectively inform educational policy and practice (Wartella et al., 2021).

The identified gaps in future research should investigate the impact of distinctive digital content and interaction patterns on a variety of cognitive domains, including numeracy, literacy, memory, attention, and problem-solving. Future research can be more effectively informed by the generation of contextual and updated data, thereby ensuring that digital tools are effectively integrated into early childhood education to support cognitive development.

Methodology

This study used a descriptive research design to examine how electronic device use influences young children's cognitive abilities. Data were collected through a structured questionnaire adapted from validated instruments, grounded in recent research on technology integration in early childhood education (Neumann & Neumann, 2019; Hwang et al., 2020; Richland et al., 2019; Best, 2020; Schmitt et al., 2021). The questionnaire targeted cognitive skills such as memory, attention, and problem-solving to assess the specific effects of digital tool use in alignment with the study's goals. A transmittal letter was initially sent to the school principal to request permission for the study. Upon approval, questionnaires were distributed to teachers, who then forwarded them to parents, ensuring participant anonymity and confidentiality of responses. Responses were measured on a 5-point Likert scale, from "Strongly Disagree" (1.00–1.80) to "Strongly Agree" (4.21–5.00), to capture perceptions of the impact of electronic devices on cognitive skills. Data analysis was conducted using statistical software, with significance determined at the 0.05 level. Correlation analysis was employed to explore the relationships between electronic device usage and various cognitive skills, identifying significant patterns and effects. This study employed an INPUT-PROCESS-OUTPUT framework to systematically structure each research phase, allowing a clear assessment of how digital exposure contributes to early cognitive development. The findings provide insights into how tailored digital

experiences may support or enhance foundational cognitive skills in young learners.

Results and Discussion

Table 1. Educational Content Accessibility

Educational Content Accessibility	Mean	VD
Electronic devices provide access to a wide range of learning materials, including apps, ebooks, and educational videos, catering to different learning styles and preferences.	4.50	SA
Learners can access educational content anytime and anywhere, making learning opportunities more flexible and ubiquitous.	4.11	A
Many electronic resources offer interactive features, such as games and quizzes, which can enhance engagement and retention of information.	4.29	SA
Adaptive learning technologies can tailor content to the individual learning pace and level of each student, addressing their specific needs and challenges.	4.14	A
Devices can integrate text, audio, visuals, and animation, providing a rich, multisensory learning experience that can aid in the understanding of complex concepts.	4.32	SA
Grand Mean	4.27	SA

The data in Table 1 highlights the significant role of electronic devices in enhancing educational content accessibility, with a grand mean of 4.27, classified as "Strongly Agree" (SA). The highest mean score of 4.50 reflects a strong consensus that electronic devices provide learners with access to a diverse range of learning materials, such as apps, ebooks, and educational videos, which support various learning styles and preferences. This variety enables personalized learning experiences, making it easier for students to find resources that match their individual needs. Additionally, the integration of interactive features like games and quizzes, scoring 4.29, suggests that these elements contribute to increased engagement and better retention of information. Devices also offer multisensory learning opportunities by combining text, audio, visuals, and animation, with a mean of 4.32, indicating that learners benefit from a richer, more engaging understanding of complex concepts. While the flexibility of accessing content "anytime and anywhere" and adaptive learning technologies score slightly lower at 4.11 and 4.14, respectively, they still reflect agreement, suggesting that learners and educators find value in the flexibility and tailored support offered by digital tools. Overall, the findings imply that electronic devices significantly enhance educational accessibility and support a personalized, engaging, and effective learning experience for students.

The data in Table 2 emphasizes the positive impact of electronic devices on learners' engagement and attitudes toward learning, with a grand mean of 4.27, indicating strong agreement (SA) overall. Learners show a marked eagerness to engage with new digital learning materials, as reflected by the highest mean score of 4.36, suggesting that digital

content's novelty and interactive nature may stimulate curiosity and motivation.

Table 2. Learning Ability

Learning Ability	Mean	VD
Learners are willing to spend more time on learning activities when engaged with interactive and multimedia content.	4.25	SA
Learners show active participation in tasks that involve electronic devices, indicating heightened interest and engagement.	4.29	SA
There is a noticeable eagerness among learners to engage with new digital learning materials.	4.36	SA
Children develop positive attitudes towards learning when they experience it through fun and interactive means.	4.18	A
Encourage children to persist with challenging tasks, boosting their resilience in learning.	4.29	SA
Grand Mean	4.27	SA

Similarly, high mean scores for active participation (4.29) and willingness to spend more time on tasks (4.25) indicate that multimedia content captures learners' attention effectively, fostering sustained interest and involvement in learning activities. The use of digital tools also appears to encourage resilience, as indicated by a mean of 4.29, implying that interactive content may help children persevere through challenging tasks. Although slightly lower, the mean score of 4.18 for developing positive attitudes through interactive experiences still shows agreement, indicating that enjoyable digital content supports a constructive approach to learning. These results suggest that electronic devices can effectively enhance learning ability by promoting active engagement, persistence, and a positive outlook toward learning.

Table 3. Digital Literacy

Digital Literacy	Mean	VD
Learners become familiar with operating devices, using touchscreens, and navigating interfaces.	4.32	SA
Even at a basic level, children learn to access information online under guidance, laying the groundwork for research skills.	4.46	SA
Introduction to discerning reliable from unreliable digital content, fostering critical evaluation skills from an early age.	4.43	SA
Opportunities to use simple digital tools for creating art, music, or stories develop creative skills and digital fluency.	4.36	SA
Education on using devices safely can begin, including understanding privacy settings and recognizing inappropriate content.	4.43	SA
Grand Mean	4.40	SA

The data in Table 3 highlights the positive effects of electronic device usage on young learners' digital literacy skills, with a grand mean of 4.40, indicating strong agreement (SA) across all indicators. Learners exhibit a foundational familiarity with operating devices, as evidenced by a mean score of 4.32, suggesting that digital tools are effectively introducing basic technological skills. The highest mean score, 4.46,

shows strong agreement that, under guidance, children are learning to access information online, which sets the stage for developing basic research skills. Additionally, digital literacy activities foster critical evaluation skills, as indicated by a mean of 4.43, through the early introduction of discerning reliable from unreliable content. Opportunities to engage with digital tools for creative activities, such as making art or music, score 4.36, highlighting the role of technology in promoting digital fluency and creativity. Safety education, including understanding privacy settings and recognizing inappropriate content, also scores 4.43, underscoring the importance of teaching responsible device usage. Overall, the findings suggest that electronic devices play a substantial role in building foundational digital literacy skills, enhancing children's ability to use technology effectively and safely from an early age.

Table 4. Numeracy Skills

Numeracy Skills	Mean	VD
Demonstrating the ability to count objects and understand that the last number represents the total quantity.	4.45	SA
Being able to recognize and name numbers up to at least 20.	4.58	SA
Starting to grasp simple addition and subtraction using physical objects or visual aids.	4.58	SA
Ability to identify and create simple patterns, recognizing sequences in their environment.	4.48	SA
Basic understanding of measurement concepts such as big/small, more/less, and comparisons between objects.	4.45	SA
Grand Mean	4.51	SA

The data in Table 4 underscores the strong development of numeracy skills among learners, with a grand mean of 4.51, reflecting strong agreement (SA) across all indicators. Learners show high proficiency in foundational counting skills, demonstrated by their ability to count objects and understand total quantities, with a mean score of 4.45. The highest mean scores of 4.58 are for recognizing numbers up to at least 20 and grasping basic addition and subtraction using physical objects or visual aids, suggesting that electronic tools effectively reinforce these early math skills. Learners also exhibit the ability to identify and create simple patterns, as shown by a mean of 4.48, indicating that digital activities support pattern recognition and sequencing. Additionally, learners display a solid understanding of measurement concepts, such as comparing sizes and quantities, with a mean of 4.45. Overall, the results suggest that electronic devices can play a crucial role in enhancing early numeracy skills, providing young learners with interactive and visually engaging ways to develop essential mathematical concepts.

The data in Table 5 underscores the positive impact of electronic devices on young learners' literacy skills, with a grand mean of 4.40,

indicating strong agreement (SA) across all indicators.

Table 5. Literacy Skills

Digital Literacy	Mean	VD
Recognizing and naming letters of the alphabet in both uppercase and lowercase forms.	4.39	SA
Understanding that words are made up of sounds and being able to play with sounds (e.g., rhyming, beginning sounds).	4.43	SA
Starting to read simple words or sentences, and recognizing some sight words.	4.46	SA
Writing their own name and other simple words with assistance.	4.39	SA
Demonstrating understanding of simple stories through pictures or texts, answering questions about what they've read or heard.	4.32	SA
Grand Mean	4.40	SA

Learners demonstrate a particularly strong ability in beginning to read simple words or sentences and recognizing sight words, reflected by the highest mean score of 4.46. This suggests that digital tools may effectively support early reading skills, providing engaging content that reinforces word recognition and basic reading comprehension. Similarly, learners show strong capabilities in phonemic awareness, understanding that words are composed of sounds and participating in sound-based activities like rhyming, with a mean score of 4.43. Other foundational skills, such as recognizing and naming alphabet letters and writing their own names, both score 4.39, indicating that digital activities are enhancing letter recognition and early writing. Furthermore, learners display understanding of simple stories, as evidenced by a mean score of 4.32, showing that digital storytelling and visual aids may foster reading comprehension. Overall, these results imply that electronic devices can be valuable in building early literacy skills, supporting learners in foundational reading, writing, and phonemic awareness.

Table 6. Memory and Recall

Memory and Recall	Mean	VD
Ability to remember information over short periods, such as following simple instructions or recalling recently learned words.	4.14	A
Remembering the sequence of daily activities or routines.	4.29	SA
Being able to retell a simple story in their own words after hearing it.	4.18	A
Recognizing previously seen items or images when presented among new ones.	4.25	SA
Remembering where objects are usually stored or where they were last placed.	4.21	SA
Grand Mean	4.21	SA

The data in Table 6 demonstrates that electronic device usage positively impacts young learners' memory and recall abilities, with a grand mean of 4.21, categorized as "Strongly Agree" (SA). Learners show strong competence in remembering routines and sequences, as indicated by a mean score of 4.29, suggesting that digital engagement might support

structured thinking and memory of regular activities. The ability to recognize previously seen items or images also scores highly, with a mean of 4.25, indicating that digital tools may reinforce visual memory skills. Additionally, learners demonstrate proficiency in remembering where objects are stored or last placed, with a mean score of 4.21, which implies that digital activities involving spatial or object-based memory could enhance recall abilities. While slightly lower, the mean scores for following simple instructions (4.14) and retelling stories (4.18) still indicate agreement, suggesting that learners are developing these skills with some support. Overall, the findings suggest that digital experiences can aid young children in building foundational memory and recall skills, contributing positively to their cognitive development.

Table 7. Attention and Concentration

Attention and Concentration	Mean	VD
Can focus on a task or activity for increasing periods, showing interest in details.	4.0	A
Ability to switch attention from one activity to another with minimal adult assistance.	4.04	A
Can concentrate on a specific task even with distractions present in the environment.	3.86	A
Capable of following two- to three-step directions.	4.0	A
Shows ability to listen and participate in group settings, like story time or group discussions.	4.11	A
Grand Mean	4.00	A

The data in Table 7 assesses the impact of digital tools on attention and concentration abilities among learners. The mean ratings indicate a general agreement that these tools positively influence various aspects of attention and concentration. Learners can focus on a task or activity for increasing periods, showing interest in details, with a mean rating of 4.0 (agree). They also demonstrate the ability to switch attention from one activity to another with minimal adult assistance, reflected in a mean rating of 4.04 (agree). The ability to concentrate on a specific task even with distractions present in the environment has a mean rating of 3.86 (agree). Learners are capable of following two- to three-step directions, with a mean rating of 4.0 (agree). Additionally, they show the ability to listen and participate in group settings, such as story time or group discussions, with the highest mean rating of 4.11 (agree). The grand mean of 4.00 indicates an overall consensus that digital tools positively contribute to the development of attention and concentration skills among learners.

The data in Table 8 highlights the positive influence of electronic device usage on young learners' social and emotional development, with a grand mean of 4.37, indicating strong agreement (SA) across most indicators. Learners show a high level of independence and collaboration skills, as reflected in the highest mean scores of 4.51 for both "Engaging in play that involves sharing, taking turns, and

collaborating with peers" and "Showing increasing independence in personal care and making choices."

Table 8. Social and Emotional Development

Social and Emotional Development	Mean	VD
Beginning to manage emotions with some support, can express feelings using words.	4.14	A
Showing understanding or concern for the feelings of others.	4.25	SA
Engaging in play that involves sharing, taking turns, and collaborating with peers.	4.51	SA
Recognizing basic facial expressions and social cues of others.	4.42	SA
Showing increasing independence in personal care and in making choices.	4.51	SA
Grand Mean	4.37	SA

These results suggest that electronic devices, when used thoughtfully, may support the development of social skills by encouraging cooperative play and decision-making. Additionally, learners demonstrate strong abilities in recognizing basic facial expressions and social cues, with a mean score of 4.42, further indicating that digital tools might play a role in reinforcing empathy and social awareness. While the ability to manage emotions independently has a lower score of 4.14, categorized as "Agree," it still suggests that learners are progressing in emotional regulation with some support. Overall, these findings imply that digital tools can effectively foster essential social and emotional skills in young children, enhancing both their interpersonal interactions and self-management abilities.

Table 9. Problem Solving Skills

Problem Solving Skills	Mean	VD
Can recognize a simple problem and express it in their own words.	3.92	A
Comes up with basic solutions to simple problems, often through trial and error.	4.07	A
Making choices between two or more options in play or learning tasks.	4.14	A
Beginning to use tools or materials (e.g., puzzles, building blocks) for their intended purpose in problem-solving.	4.25	SA
Recognizing when they need help and asking for it appropriately.	4.14	A
Grand Mean	4.10	A

The data in Table 9 reflects learners' developing problem-solving skills, with a grand mean of 4.10, categorized as "Agree" (A). Learners demonstrate a strong ability to recognize simple problems and express them verbally, with a mean score of 3.92, indicating a foundational understanding of identifying issues. They also show a willingness to engage in trial and error, scoring 4.07, which suggests that learners are exploring basic solutions independently. The ability to make choices between options in tasks or play, with a mean of 4.14, shows that decision-making skills are emerging within problem-solving contexts. Notably, learners exhibit slightly higher proficiency in using tools and materials for problem-solving, such as puzzles or building blocks, with a mean of 4.25, suggesting that hands-on activities may strengthen

purposeful tool use. The same score (4.14) for recognizing when to seek help highlights developing social awareness and self-regulation.

Table 10. Significant Relationship Between Education Content quality and dimension of cognitive abilities

Cognitive Ability	r-value	t-value	p-value	Remarks	Decision
Numeracy Skills	0.913836	11.47462	0.000	Significant	Reject
Literacy Skills	0.919019	11.8872	0.000	Significant	Reject
Memory and Recall	0.870361	9.012715	0.000	Significant	Reject
Attention and Concentration	0.844987	8.056668	0.000	Significant	Reject
Social and Emotional Development	0.849646	8.215286	0.000	Significant	Reject
Problem-Solving Skills	0.913932	11.48201	0.000	Significant	Reject

The data from Table 10 illustrates significant relationships between education content quality and various dimensions of cognitive abilities. The r-values indicate very strong positive correlations, ranging from 0.845 to 0.919. Literacy skills show the highest correlation with education content quality (r = 0.919), followed closely by numeracy skills (r = 0.914) and problem-solving skills (r = 0.914). Memory and recall also have a strong correlation (r = 0.870), as do social and emotional development (r = 0.850) and attention and concentration (r = 0.845). The t-values are substantial, with literacy skills showing the highest t-value of 11.887, emphasizing the robustness of these relationships. All p-values are 0.000, confirming the statistical significance of these correlations. These findings suggest that high-quality educational content is significantly associated with enhanced cognitive abilities, particularly in literacy, numeracy, and problem-solving skills, as well as memory, social and emotional development, and attention. This underscores the importance of high-quality educational content in fostering comprehensive cognitive development.

Table 11. Significant Relationship Between Learning Ability and dimension of cognitive abilities

Cognitive Ability	r-value	t-value	p-value	Remarks	Decision
Numeracy Skills	0.925694	12.47815	0.000	Significant	Reject
Literacy Skills	0.942582	14.39107	0.000	Significant	Reject
Memory and Recall	0.899587	10.50282	0.000	Significant	Reject
Attention and Concentration	0.843629	8.01166	0.000	Significant	Reject
Social and Emotional Development	0.833089	7.679699	0.000	Significant	Reject
Problem-Solving Skills	0.907735	11.03236	0.000	Significant	Reject

The data from Table 11 demonstrates significant relationships between learning ability and various dimensions of cognitive abilities. The r-values, indicating very strong positive correlations, range from 0.833 to 0.943. Literacy skills show the highest correlation with learning ability (r = 0.943), followed by numeracy skills (r = 0.926), problem-solving skills (r = 0.908), memory and recall (r = 0.900), attention and concentration (r = 0.844), and social and emotional development (r =

0.833). The t-values further underscore these correlations, with literacy skills having the highest t-value of 14.391, indicating robust statistical significance. All p-values are 0.000, confirming the statistical significance of these findings. These results suggest that enhanced learning abilities are significantly associated with improved cognitive abilities across various dimensions, particularly in literacy, numeracy, and problem-solving skills, as well as memory, attention, and social and emotional development. This underscores the critical importance of fostering learning abilities to achieve comprehensive cognitive development.

Table 12. Significant Relationship Between Digital Literacy and dimension of cognitive abilities

Cognitive Ability	r-value	t-value	p-value	Remarks	Decision
Numeracy Skills	0.863163	8.716701	0.000	Significant	Reject
Literacy Skills	0.866247	8.840799	0.000	Significant	Reject
Memory and Recall	0.841426	7.939787	0.000	Significant	Reject
Attention and Concentration	0.767047	6.09607	0.000	Significant	Reject
Social and Emotional Development	0.788681	6.541116	0.000	Significant	Reject
Problem-Solving Skills	0.863372	8.725	0.000	Significant	Reject

The data from Table 12 reveals significant relationships between digital literacy and various dimensions of cognitive abilities. The r-values indicate very strong positive correlations, ranging from 0.767 to 0.866. Literacy skills and numeracy skills show the highest correlations with digital literacy (r = 0.866 for both), followed closely by problem-solving skills (r = 0.863), memory and recall (r = 0.841), social and emotional development (r = 0.789), and attention and concentration (r = 0.767). The t-values support these correlations, with literacy skills and numeracy skills having the highest t-values of 8.841 and 8.717, respectively, emphasizing the robustness of these relationships. All p-values are 0.000, confirming the statistical significance of these findings. These results suggest that higher levels of digital literacy are significantly associated with enhanced cognitive abilities across various dimensions, particularly in literacy, numeracy, and problem-solving skills, as well as memory, social and emotional development, and attention. This underscores the critical role of digital literacy in fostering comprehensive cognitive development.

Discussion

The results of this study underscore the significant role of digital tools in enhancing various cognitive abilities among young learners, aligning with existing research that highlights the benefits of technology integration in early childhood education. The strong correlations observed between high-quality educational content and cognitive

abilities, particularly in literacy, numeracy, and problem-solving skills, suggest that well-designed digital resources can effectively reinforce foundational skills (Neumann & Neumann, 2019; Zhao et al., 2020). The interactive nature of digital content, including elements like games, quizzes, and adaptive learning technologies, promotes engagement and persistence in tasks, which are essential for cognitive development (Radesky & Christakis, 2020). For instance, adaptive technologies that adjust to a learner's pace and skill level support personalized learning, allowing students to tackle challenges suited to their abilities, thereby fostering resilience and sustained interest (Hirsh-Pasek et al., 2022). Additionally, digital tools that offer multisensory experiences help young children understand complex concepts, catering to diverse learning styles and preferences (Lovato et al., 2022).

Furthermore, the strong correlations between digital literacy and cognitive abilities indicate that early exposure to digital tools not only develops basic technical skills but also supports critical thinking and self-regulation. Digital literacy activities that involve discerning reliable from unreliable information and learning safe usage practices are crucial in building both technological fluency and critical evaluation skills (Livingstone & Blum-Ross, 2023; Zosh et al., 2021). These skills are foundational to later academic success, as they prepare young learners to navigate the digital landscape responsibly and effectively. The findings also highlight the importance of digital literacy in promoting social-emotional development, as interactive digital content encourages cooperation, empathy, and self-expression among peers (Robinson & Ruggs, 2022). The association between digital engagement and social skills supports the idea that digital platforms, when used thoughtfully, can cultivate essential interpersonal skills that contribute to holistic development in young learners (Morrison et al., 2022).

Conclusion

In conclusion, the findings of this study highlight the positive impact of electronic device usage on young learners' cognitive and social-emotional development. High-quality digital content has proven effective in strengthening foundational skills, particularly in literacy, numeracy, and problem-solving, by providing engaging, adaptive, and multisensory learning experiences. This adaptability allows children to progress at their own pace, enhancing both their resilience in facing challenges and their sustained interest in learning activities. Additionally, digital literacy emerges as a crucial factor in developing critical thinking, safety awareness, and responsible online behavior, setting the groundwork for effective navigation of the digital world.

The study further emphasizes the role of digital tools in fostering social-emotional skills, including empathy, cooperation, and self-expression, which are essential for interpersonal relationships. This suggests that

thoughtfully integrated digital tools can support a well-rounded approach to early education, balancing cognitive skill-building with socio-emotional development.

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