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Digital storytelling in childhood education: Perceptions of Saudi early childhood teachers

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Abstract

This quantitative study investigates Saudi early childhood teachers' usage of digital storytelling to support children's academic and social development. A quantitative approach was adopted to collect data from 200 early childhood teachers working in public and private schools over nine weeks. The scales explored teachers' usage of DST as a pedagogical tool to support children's academic and social development and learning, the benefits and challenges teachers face when integrating DST into their teaching practices, and the impact of DST on children's engagement, creativity, narrative skills, and media literacy. The findings indicated that the majority of respondents held positive attitudes toward DST as a pedagogical tool. They also indicated a positive influence on children's academic learning and social development. The respondents revealed some challenges related to lack of training, managing children, and costs associated with equipment and software tools. Test results showed statistically significant associations between teachers' attitudes towards using DST and years of teaching experience. No statistically significant associations were found between teachers' attitudes and school type. This study offers valuable insights into educational technology, especially media literacy for childhood education, to integrate DST into weekly lesson plans to maximize its impact on children's academic and social development.

Keywords: Digital storytelling, Early childhood education, Educational technology, Media literacy, Teacher perceptions, and children.

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Contents

Contribution of this paper to the literature

This study contributes to the existing literature through providing qualitative-questionnaire method evidence on the influence of digital storytelling on children's academic achievement and social development. As well as explore challenges and benefits reported by Saudi early childhood teachers regarding the usage of technological tools and media in their classrooms to teach children.

1. Introduction

Digital storytelling has become a powerful instrument in the changing environment of early childhood, whereby early childhood teachers have found an easy way to encourage and enhance both academic and social performance of children. Digital storytelling is the art of using digital tools, including computers, tablets, cameras, and multimedia software, to generate narratives by pairing images, audio, text, and video into well-structured and coherent stories, which captivate young learners because of the way they are delivered (O'Byrne, Houser, Stone, & White, 2018). Through the use of multimedia, including images, audio, video, and interactivity, digital storytelling is fun and engaging to young learners and has a vibrant teaching and learning platform (Preradovic, Lesin, & Boras, 2016; Yilmaz & Sığirtmaç, 2023). Applying digital storytelling in early childhood classrooms is not a technological trend but a methodological approach that accommodates the developmental needs and interests of children growing up in a digital-filled environment (Dziuina, 2020). Early childhood educators who implement digital storytelling in their teaching explore ways to help children acquire key academic skills. Digital storytelling can positively influence children's abilities in areas such as mathematical reasoning, problem-solving, and computer literacy (O'Byrne et al., 2018). Specifically, the Croatian case study identified that preschoolers and kindergarteners taught with the help of digital stories were more effective than those taught using traditional storytelling methods in solving computational and mathematical problems (Preradovic et al., 2016).

Research increasingly supports the academic benefits of digital storytelling in childhood education. Literature shows that children exposed to digital storytelling experience breakthroughs in key educational skills, particularly in language, mathematics, and early literacy (O'Byrne et al., 2018; Yilmaz & Sığirtmaç, 2023). Digital storytelling that is interactive and of a multimedia character improves the motivation and participation of children so that abstract ideas are more intelligible and can be remembered (Prasetya & Hirashima, 2018). Moreover, digital storytelling aids in establishing digital literacy as the key 21st-century skill because children become exposed to the use of digital tools and platforms since their early years (Stepić, Veličković, Jovanović, & Miletić, 2023).

Other than academic benefits, digital storytelling is important in promoting social and emotional development in preschoolers and kindergarteners. The group character of developing and sharing digital stories stimulates children to collaborate, compromise on ideas, and use creativity to express ideas and emotions (Voillot, Matuszewski, Chevrier, & Bevilacqua, 2024). It is noted that in the process of digital storytelling, children tend to actively participate in creating stories, changing plots, discussing the meanings with each other, and experimenting with the design details of digital devices, which gives the children a sense of agency and social interaction. Additionally, teachers' roles are important in the process as they facilitate storytelling activities and serve as respondents to the ideas shared by children, enabling them to create a responsive, inclusive environment in which the teacher acts as an interactor with the child (Voillot et al., 2024). Also, digital storytelling can be applied to encourage cultural awareness and national identity because the story can be customized to suit children's cultural background and experiences, thus creating identity and pride (Öngören, 2021).

Especially, digital storytelling proves its efficiency in the process of creativity stimulation and motivation of young learners. Digital stories allow children to be expressive and to discover new concepts with the help of multiformat experiences: 2D animation, augmented reality experiences, and more. Digital stories are also quite entertaining and interactive, and they can engage children to join the learning process actively, which makes the process of education fruitful and pleasant (Öngören, 2021). The digital literacy level and willingness to employ the latest technologies are important factors in the successful integration of digital storytelling in the early childhood education sector. To fully capitalize on the benefits of this approach, professional development programs aimed at developing teachers' skills and responsibility in designing and utilizing digital stories must be introduced. Teachers with a high level of knowledge in digital storytelling are better positioned to create age-appropriate tasks, use tools effectively, and raise meaningful learning opportunities that address the diverse needs of their students or children. Furthermore, ongoing support and training will help teachers stay updated with the latest technologies and teaching methodologies, ensuring that digital storytelling becomes an actively used educational practice in the classroom (Haşlaman, Mumcu, & Uslu, 2024).

Saudi early childhood teachers believe in and value technology in education; however, their practices might not align with their strong beliefs. This research aims to investigate the challenges early childhood teachers face when integrating technology during story time, as well as how they benefit from and employ technology in their teaching practices. The study also highlights the benefits of digital technologies on children's learning and development. Evidence from the research indicates that children engaged in digital storytelling activities are more creative compared to results from pre- and post-tests discussed in the study. Furthermore, this research could contribute to the existing literature both nationally and internationally. Nationally, Saudi policymakers could benefit from the findings by understanding teachers' practices, beliefs, perspectives, and challenges. This understanding can inform efforts to develop teachers' practices and transform the current curriculum into a more mixed-methods teaching approach, where traditional methods meet modern technology. Internationally, access to experiences from other countries can help avoid similar issues or enable positive learning from their practices. The subsequent sections present the literature review and research questions, methodology and context, data collection and analysis, results and discussions, and conclusion and implications.

2. Review of The Literature

2.1. DST in Childhood Education

This study addresses the critical need to examine Saudi early childhood teachers' perceptions of digital storytelling as a pedagogical teaching method in which being practiced in their classrooms. Technology is being strongly emerging in all levels of education. Digital storytelling creates opportunities to develop creativity and self- expression, as through its use, children will learn about personal narratives, sharing, and communication through sharing personal narratives not only aids children but also it encourages them especially those who perform poorly in traditional literacy activities (O'Byrne et al., 2018; Rahiem, 2021). Examining early childhood teachers' points of view and beliefs about the use of technology to support children's academic learning and social development is essential. This study exposes teachers' challenges with the use of technology during story time, as well as its benefits. Furthermore, the study highlights the positive influence of using digital technology during story time on children's learning and development. A successful incorporation of digital storytelling in education curriculums must be carefully planned and evaluated in such a way that it can be achieved with maximum potential for both educators and children (Islim, Ozudogru, & Sevim-Cirak, 2018). Digital storytelling, therefore, will always be a valuable tool in teaching the necessary skills of a 21st-century learning process as educational technologies continue to develop. This research contributes to existing literature by examining teachers' perceptions and sharing their experiences of digital storytelling practices in Saudi early childhood schools.

Early childhood educators increasingly adopted formalized approaches for teaching and playing to support and promote children's academic and social development. When storytelling is combined with play-based activities, it can provide an effective motivation for early literacy, social development, and other academic learning skills. Samuel (2024) intended to investigate the vital role of digital storytelling as an innovative educational device for promoting literacy and communication skills. Based on the research findings, the study concluded that digital storytelling can be considered one of the strong tools in contemporary educational practice that provides a unique opportunity to improve literacy and communication skills by offering a multimodal learning experience. Children are provided with an opportunity to present themselves as well as what they know about the world. Since the focus is on the self, even those children who would not have thought of publishing an ordinary written draft are very engaged in the digital storytelling process.

Moradi and Chen (2019) tried to draw attention to the importance and complexity of contemporary technology, or in other words, digital storytelling (DST) in learning. Technology offers more and superior source of information that however requires solution to be mediated through the right remedy. The advent of new technology and digital resources over the last few decades has had a tremendous impact on the learning environment and subsequent educational opportunities. Nevertheless, among practitioners' problems is providing learners with the skills needed to successfully use modern technology in the learning process. Researchers suggested that both social constructivism and technology-based learning are useful for acquiring and achieving current academic aspirations. It also expounds on the most striking moments of DST usage in language education in terms of stages and components of an effective digital story, processes of making a digital story, as well as a critical account of how DST is being implemented and nurtured for academic achievement. Moreover, as was demonstrated by Catalano and Catalano (2022), digital storytelling is the method associated with the utilization of different digital tools (a device, a web application, images, sounds, videos, etc.) to create digital stories. To their mind, digital storytelling has become a new teaching strategy due to the elements of novelty in it, and in comparison with traditional one. The digital stories may be selected and designed by the teachers on the basis of the interests of the children. Meanwhile, digital storytelling allows children to interpret their personal experiences and personal knowledge, as well children are acquainted with knowledge and teachers learn about them (Maureen, van der Meij, & de Jong, 2018; Merjovaara, Nousiainen, Turja, & Isotalo, 2020; Purnama, Ulfah, Ramadani, Rahmatullah, & Ahmad, 2022).

Yilmaz and Siğirtmaç (2023) demonstrated that digital stories might be applied with various purposes because of their positive impact on the educational process. Upon investigating the study on higher levels of schooling, it has been concluded that the learning and instruction process of teaching science, mathematics, and literacy through the implementation of digital stories has a beneficial effect on education. However, there is not much research aimed at exploring the procedure of applying digital stories to childhood education in science, mathematics, and literacy practices. Theodosiadou (2019) demonstrated that storytelling has many advantages for education; some of the most vital are: it invokes hypothetical thinking, enables group cohesiveness, shapes the course of learning, and connects to the empowerment of children. Digital storytelling (DS) is a new concept, originating from the Digital Storytelling movement of the 1980s, whose co-conceptualists founded an organization called the Center of Digital Story. DS has been applied at every level of formal adult education and in many other classes (Theodosiadou, 2019). Needless to add, that digital storytelling has also been applied in teaching of values in special education and equally in the demonstration of media literacy in childhood education (Bilici & Yilmaz, 2024). The studies have discovered the presence of significant educational merits of digital storytelling on preschoolers and kindergarteners, including the development of narratives, group work, rising sense of self-responsibility, and meta-cognition of the performance of young children. In addition, it has also been a supplementary problem-based learning mechanism in improving the motivation of children and young children. The use of DS in combination with media education will become the most successful experiment most likely in childhood education (Castillo-Rodriguez, Díaz, & Lage, 2022).

Digital storytelling considers a beneficial teaching and learning method in which it has a positive impact on the teaching and learning process for children. Nevertheless, it was also indicated that there are areas to be improved in the use of digital stories; thus, digital literacy and technology training need to be involved in teachers' education programs to support and enhance teachers' skills (Hurtado-Mazeyra, Alejandro-Oviedo, Núñez-Pacheco, & Almenara, 2023; Yilmaz & Siğirtmaç, 2023). Another common challenge reported by teachers includes a lack of vocabulary in each child and insufficient professional training in using storytelling in language teaching (Otoluwa, Talib, Tanaiyo, & Usman, 2022). Additionally, teachers need to be more comfortable with technology use and digital story production to teach and engage their students effectively and enjoyably (Tzima, Styliaras, Bassounas,

& Tzima, 2020). Digital storytelling presents massive opportunities as a tool in childhood education, ranging all the way to massive improvements in motivation, creativity, cognitive abilities, cultural understanding, and language development (Al-Abdullatif, 2022; Maureen, van der Meij, & de Jong, 2020). Nevertheless, some issues persist regarding teachers' perpetration programs, teachers' readiness, technology availability, access to resources and the necessity of adequate training to achieve the maximum effect of digital storytelling in regard to creative teaching in early childhood education.

2.2. DST for Children's Academic and Social Development

Stepić et al. (2023) indicated that digital storytelling positively influences children's academic and critical thinking, and has great improvements in co-regulation and story-telling skills. Shengjergji (2024) examined the topic of early childhood children's interactions with teachers involved in digital storytelling activities using the Book Creator app. According to the findings, the children negotiated and expressed agency in modifying the plot of a given story and cooperated with their peers, with the respective teacher acting as a mediator. The reason why it is important refers to responsive instruction that promotes the active role or agency of early childhood children in digital storytelling, and contributes to academic and social growth in early childhood education. A research study by Castillo-Rodriguez et al. (2022) examined the digital storytelling tools, and activities, and themes offered by preservice early childhood teachers to young children. The researchers identified that character dialogues were very common throughout stories, the most popular type of activity involved reading comprehension and image-based tasks, and the most common themes were related to animals and friendship. This implies that digital story telling may be customized by early childhood teachers to the interest and developmental level thus, advancing the understanding and early literacy and cognitive functioning (Bilici & Yilmaz, 2024).

Digital storytelling can be a highly versatile pedagogical tool that can be used by early childhood teachers to promote academic skills, creativity, agency of the children, and their digital literacy, as well as to aid their higher-level educational objectives (Haşlaman et al., 2024). When storytelling applies as an approach in promoting vocabulary learning among early childhood children, learning could be more interesting, dynamic, and conversational. This technique is efficient in developing the vocabulary of children since this is the basis of both oral and written communication (Otoluwa et al., 2022). Storytelling promotes the development of social communicational skills in young learners aged between 4-6 years (Al-Abdullatif, 2022; Otoluwa et al., 2022). A study by Saputri, Putri, Ningsih, and Andikos (2024) was about the effects of technology-based learning models on the social interaction of early childhood children stressed with the use of digital tools, such as teaching apps and other online services on children's social-interaction development. Children were found motivated to collaborate and communicate with each other via the use of technology apps. Technology has made the learning environment very interactive and inspiring for children. It has enriched their lives socially, such as sharing and communicating effectively. The approach enhances children's motivation and promotes greater involvement in social activities, proving that digital storytelling and technology-based learning models are reliable methods for encouraging social development in childhood education (Saputri et al., 2024).

Kalyva (2024) recognized the importance of digital tools in the process of enhancing critical skills, such as logical thinking and problem-solving in which play an important role at the level of social interaction and cooperation to children development. Furthermore, Al-Abdullatif (2022) and Rahim, Sujud, Yacob, and Hamzah (2008) illustrated that digital storytelling, assisted by technology-based learning models and interactive digital tools can contribute vastly to increasing social development in early childhood children, enhancing their levels of collaboration, communication, and desire to learn. A case study by Preradovic et al. (2016) has shown that digital storytelling has a high benefit for use in childhood education, especially in improving mathematical and computational abilities of children. When 6-7-year-old children were trained in mathematics through digital storytelling, their improvement was significantly higher compared to traditional storytelling. Teachers reported increased motivation and engagement when digital storytelling was used with children, indicating its suitability and comprehensive nature for early ICT-based work in childhood schools.

3. The Current Study

The study aimed to explore how early childhood teachers use digital storytelling as a pedagogical tool to support children's academic development. It also examined the role of digital storytelling in enhancing early childhood children's social development, including collaboration, communication, and motivation to learn. Furthermore, it sought to identify the benefits and challenges early childhood teachers encounter when integrating digital storytelling into their teaching practices. Additionally, the study assessed the influence of digital storytelling on children's engagement, creativity, and narrative skills in early childhood education. Finally, it investigated how digital storytelling can promote media literacy and ethical understanding among early childhood children. The study focuses on three related research questions.

1) How early childhood teachers use digital storytelling as a pedagogical tool to support children's academic and social development?
2) How digital storytelling can impact and foster children's creativity, narrative skills, media literacy, and ethical understanding?
3) What are the benefits and challenges early childhood teachers face when integrating digital storytelling into their teaching practices?

4. Research Methodology and Procedures

A quantitative approach using a descriptive analytical method was employed in this study to explore the impact of using digital storytelling by early childhood teachers to support children's academic and social development and learning in their professions. The Committee of Research Ethics of the author's university approved this study, and an IRB approval form was obtained prior to conducting its research. All ethical guidelines were followed. Each participant provided electronic informed consent prior to accessing the survey, indicating that participation in the

study was voluntary. All participants were informed that they were free to withdraw from the study at any time without fear of retribution.

4.1. Context and Sample

Data were collected from a random sample of 200 teachers in early childhood education in Riyadh, Saudi Arabia, over 9 weeks. The sample consisted of female in-service early childhood teachers working in public and private schools, teaching children aged 3 to 6 years. The comprehensive questionnaire was distributed to a group of early childhood teachers who use and have knowledge of digital storytelling in teaching kindergarten and preschool children. According to Krejcie and Morgan (1970), to determine the minimum size for a quantitative research sample, the required sample size for quantitative variables should be between 100 and 200 to be sufficient.

4.2. Data Collection

An online questionnaire was used and distributed to early childhood teachers as a research tool to study the impact of digital storytelling by teachers on supporting children's academic and social development and learning. The questionnaire was prepared and refined through reviewing literature related to the research aims.

The questionnaire consists of two main parts as follows:

First Part: includes primary data for the study sample of early childhood teachers. Second Part: the axes of the questionnaire where:

The First axis: how do early childhood teachers use digital storytelling as a pedagogical tool to support children's academic development? It consisted of (5) statements.

The second axis: the role of digital storytelling in enhancing early childhood children's social development, including collaboration, communication, and motivation to

learn. It consisted of (5) statements.

The third axis: the benefits and challenges early childhood teachers face when integrating digital storytelling into their teaching practices. It consisted of (10) statements.

The fourth axis: the impact of digital storytelling on children's engagement, creativity, and narrative skills in early childhood education. It consisted of (5) statements.

The fifth axis: how can digital storytelling foster media literacy and ethical understanding among early childhood children? It consisted of (5) statements.

Responses to the questionnaire items were collected using a five-point Likert scale, where it represents Strongly Disagree, 2 represents Disagree, 3 represents Neutral, 4 represents Agree, and 5 represents Strongly Agree.

4.3. Data Analysis

Statistical Package for Social Sciences (SPSS) is a friendly user software package used for the analysis of statistical data and to make data-driven decisions. According to Rahman and Muktadir (2021), educators and social sciences researchers are usually needed to deal with large data, in which mostly collected online. The SPSS program provides a big advantage, which is being designed to deal with a large set of data associated with multiple variables (Rahman & Muktadir, 2021). Additionally, unlike quantitative research, the field of education is aware of its in-depth qualitative research analysis, in which researchers provide a deep and rich volume of written data linked with a small to medium number of participants. Sun (2019) illustrated that statistical analysis is growing in the educational field due to social changes and the increased demand for statistical programs. The educational field is being exposed to and utilizing in-depth numerical analysis for their educational subjects (Sun, 2019). In educational research, SPSS can be the key to convert raw data into practical insights, applicable knowledge, and clear takeaways that informed policymakers and drive decisions in curricula development.

The research relies on the use of two main sources of information.

1. Secondary sources: In addressing the research theoretical framework, reliance was placed on secondary data sources, which include Arabic and foreign books and references related to the subject, and previous articles, research, and studies that discussed earlier.
2. Primary sources: To address the field aspect, the questionnaire was relied upon as the main tool for the study. The questionnaire was built based on the theoretical framework of the study and previous studies related to the research topic. The opinions of some academic specialists in the field of research were also used.

The data were monitored and statistically processed using the following statistical methods through the Statistical Package for Social Sciences (SPSS).

- Descriptive statistics: including frequencies, percentages, means, and standard deviation, were used to describe the study sample members and determine the extent of response to the axes of the study tool and the proportions and averages of these responses.
- Cronbach's alpha coefficient: to verify the reality of the research questionnaire items.
- Pearson correlation coefficient: to determine the level of internal consistency and verify the validity of the research tool (questionnaire).

4.4. The Validity of The Study Tool

4.4.1. Face Validity

To ensure the instrument's validity, the researcher enlisted the help of a panel of experts whose involvement was required to determine the questionnaire's content validity. The members were instructed to review the questionnaire for language, applicability, and consistency. Some suggestions and comments were received, and minor changes to the questionnaire were made as a result.

4.5. Internal Consistency

Internal consistency was calculated using the Pearson correlation coefficient between each item and the axis to which it belonged, with the results shown as follows.

Table 1. Internal correlation between items and axes in the questionnaire.

N	Correlation coefficient	N	Correlation coefficient	N	Correlation coefficient
1	0.690**	11	0.741**	21	0.588**
2	0.596**	12	0.644**	22	0.771**
3	0.515**	13	0.678**	23	0.699**
4	0.602**	14	0.752**	24	0.733**
5	0.714**	15	0.712**	25	0.619**
6	0.764**	16	0.709**	26	0.638**
7	0.623**	17	0.584**	27	0.441**
8	0.845**	18	0.632**	28	0.576**
9	0.769**	19	0.706**	29	0.733**
10	0.590**	20	0.674**	30	0.576**

Note: **. Correlation is significant at the 0.01 level (2-tailed).

From Table 1, we conclude that all Pearson correlation coefficients between each item and its corresponding axis are high and significant (where the significance value is less than 0.05). This indicates a high degree of internal consistency validity of the questionnaire's terms.

4.6. Reliability of Tools

The reliability of the study tool indicates that it will produce approximately the same results when applied repeatedly to the same sample. The questionnaire's reliability was assessed using Cronbach's alpha coefficient, as demonstrated in the following table.

Table 2. Cronbach's alpha coefficients.

Axis	N of Items	Cronbach's Alpha
How do early childhood teachers use digital storytelling as a pedagogical tool to support children's academic development?	5	0.812
The role of digital storytelling in enhancing early childhood children's social development, including collaboration, communication, and motivation to learn	5	0.804
The benefits and challenges early childhood teachers face when integrating digital storytelling into their teaching practices	10	0.852
The impact of digital storytelling on children's engagement, creativity, and narrative skills in early childhood education	5	0.831
How can digital storytelling foster media literacy and ethical understanding among early childhood children?	5	0.793
Total degree	30	0.897

From Table 2, we conclude that the reliability coefficients value of all axes of questionnaire were all high scores approaching the correct one and the total degree of reliability was (0.897) which is high value and approaching the correct one and it refers to the reality of the questionnaire for the application.

5. Results and Discussions

This study examines the impact of using digital storytelling by early childhood teachers to support children's academic and social development and learning. The questionnaire was prepared to achieve the study's goal and answer its questions as follows.

5.1. Study Demographic Data

The frequencies and percentages of the participants were calculated according to the following:

5.1.1. Age

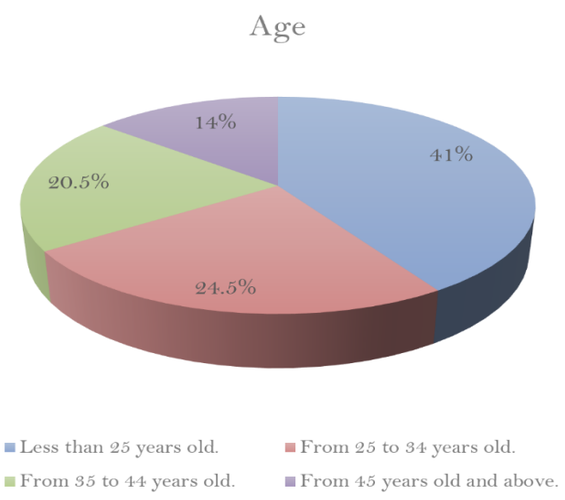

Figure 1. Age of participants.

Table 3. The age of the participants.

Age	Frequency	Percent
Less than 25 years old.	82	41.0
From 25 to 34 years old.	49	24.5
From 35 to 44 years old.	41	20.5
From 45 years old and above.	28	14.0
Total	200	100%

From Figure 1 and Table 3, we conclude that (41%) of the participants aged less than 25 years old, (24.5%) of the participants aged between 25 and 34 years old, (20.5%) of the participants aged between 35 and 44 years old, and (14%) of the participants aged from 45 years old and above.

5.1.2. Experience

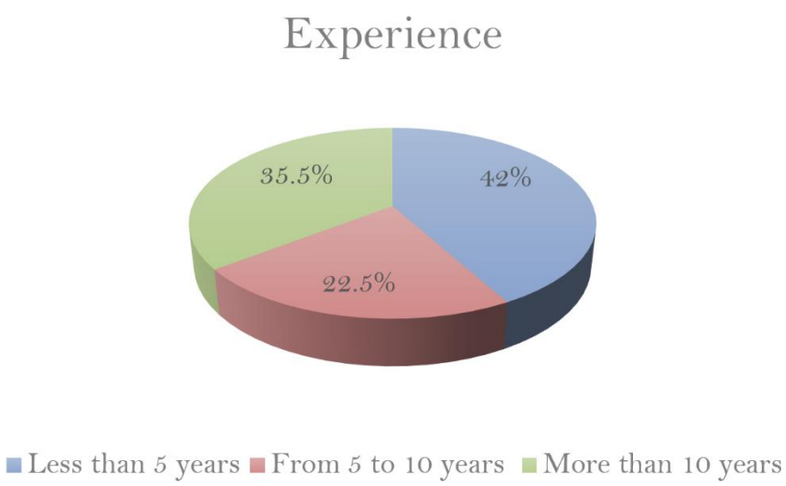

Figure 2. Participants experience.

Table 4. Experience of the participants.

Experience	Frequency	Percent
Less than 5 years	84	42.0
From 5 to 10 years	45	22.5
More than 10 years	71	35.5
Total	200	100%

From the above Figure 2 and Table 4, we conclude that (42%) of the participants have experienced less than 5 years, (35.5 %) of the participants have experienced more than 10 years, and (22.5 %) of the participants have experienced from 5 to 10 years.

5.1.3. Do you use digital storytelling in your teaching

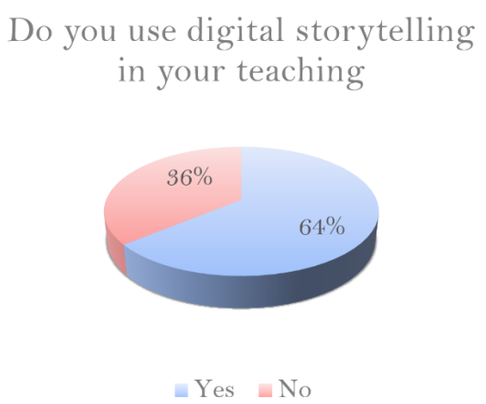

Figure 3. DST usage in teaching.

Table 5. Do you use digital storytelling in your teaching.

Do you use digital storytelling in your teaching?	Frequency	Percent
Yes	128	64.0
No	72	36.0
Total	200	100%

From Figure 3 and Table 5, we conclude that (64 %) of the participants use digital storytelling in their teaching, and (36%) of the participants don't use digital storytelling in their teaching.

5.2. Answering the Questions of the Study

The first question: How do early childhood teachers use digital storytelling as a pedagogical tool to support children's academic development? To study this, the mean and standard deviation were calculated for the first axis items as follows.

Table 6. Means and standard deviations for the items of the first axis.

No.	Item	Mean	Standard Deviation	Rank	Degree
1	I use digital storytelling to enhance early literacy skills (e.g., letter recognition, simple words).	4.23	0.545	1	Strongly Agree
2	Digital storytelling helps children understand and remember academic concepts such as numbers, shapes, and colors.	4.17	0.709	3	Agree
3	I am employed in digital storytelling to support the development of children's vocabulary and oral expression skills.	4.18	0.721	2	Agree
4	Digital storytelling contributes to fostering children's critical thinking and problem-solving skills through story plots.	4.05	0.719	4	Agree
5	I find digital storytelling effective in connecting learning to real-life situations, which deepens academic understanding.	3.91	0.812	5	Agree
General mean		4.11	0.70	Agree	

From Table 6, we conclude that early childhood teachers use digital storytelling as a pedagogical tool to support children's academic development with a degree (Agree), a mean (4.11), and a standard deviation (0.70), indicating low variability and homogeneity of opinions among the study sample on this item. In the first order (I use digital storytelling to enhance early literacy skills, such as letter recognition and simple words), the mean is (4.23), with a standard deviation of (0.545), and a degree of (Strongly Agree). In the last order (I find digital storytelling effective in connecting learning to real-life situations, which deepens academic understanding), the mean is (3.91), with a standard deviation of (0.812), and a degree of (Agree). From these results, we conclude that early childhood teachers use digital storytelling as a pedagogical tool to support children's academic development with a high degree. Using digital technology during teaching and learning can help teachers vary their methods to capture children's attention and interests (Jitsupa, Nilsook, Songsom, Siriprichayakorn, & Yakeaw, 2022). During story time, children like to listen and focus on their teachers when excitement is available. The excitement of storytelling can be achieved not only by reading from a book and changing voices, but also by using different methods such as screens or tablets. Including technology in teaching could grab children's attention to learning. Yet, early childhood teachers are highly recommended to use technology during teaching, which supports children's academic learning, understanding of shapes, numbers, and colors, letter recognition, words, vocabulary, talking skills, critical thinking, problem-solving, and investigation skills (Indriani & Suteja, 2023; Jitsupa et al., 2022; Merjovaara et al., 2020; Purnama et al., 2022; Rahiem, 2021). As a mediation, teachers are recommended to mix-method of teaching, traditional teaching with technology-use teaching to foster and enhance children's academic learning.

The second question: What is the role of digital storytelling in enhancing early childhood children's social development, including collaboration, communication, and motivation to learn? To study this role, means and standard deviations were calculated for the second axis items as follows.

Table 7. Means and standard deviations for the items of the second axis.

No.	Item	Mean	Standard Deviation	Rank	Degree
6	Digital storytelling encourages children to work together in groups to create stories.	4.21	0.768	2	Strongly Agree
7	Digital storytelling enhances verbal and non-verbal communication skills among children.	4.19	0.776	3	Agree
8	Digital storytelling increases children's motivation and desire to actively participate in learning activities.	4.32	0.601	1	Strongly Agree
9	Digital storytelling helps children understand and appreciate different perspectives through diverse stories and characters.	4.11	0.844	4	Agree
10	Digital storytelling contributes to building children's self-confidence by showcasing their work and achievements.	3.99	0.861	5	Agree
General mean		4.16	0.77	Agree	

From Table 7, we conclude that the role of digital storytelling in enhancing early childhood children's social development, including collaboration, communication, and motivation to learn with degree (Agree), mean (4.16) and standard deviation (0.77), low value, indicating the homogeny opinions of the study sample on the items of this axis. In the first order (Digital storytelling increases children's motivation and desire to actively participate in learning activities), with a mean (4.32), a standard deviation of (0.601) and a degree of (Strongly Agree). While in the last order (Digital storytelling contributes to building children's self-confidence by showcasing their work and achievements), with a mean of (3.99) and a standard deviation (0.861), with a degree of (Agree). From the results, we conclude that the role of digital storytelling in enhancing early childhood children's social development, including collaboration, communication, and motivation to learn with a high degree. Using technology in teaching and learning not also enhance children's academic learning, but also promotes children's social developmental skills in various ways (Maureen et al., 2020). When children interact using any technological tool, they support their communicational and collaborational skills. During story time, using technology encourages children to communicate effectively, work in small or big groups, develop their verbal and nonverbal contact, urge them to participate and be active, and more (Al-Abdullatif, 2022; Haşlaman et al., 2024; Manullang, Banjarnahor, & Simanjuntak, 2021; Toki & Pange, 2014). Furthermore, DST supports children's understanding and assist them to

appreciate different views (Adara, 2020). DST also helps build children's self-esteem by sharing their thinking and showing their work (Ong & Aryadoust, 2023).

The third question: What are the benefits and challenges early childhood teachers face when integrating digital storytelling into their teaching practices? To study these benefits and challenges, means and standard deviations were calculated for the third axis items as follows.

5.2.1. Benefits

Table 8. Means and standard deviations to the benefits.

No.	Item	Mean	Standard Deviation	Rank	Degree
11	Digital storytelling simplifies lesson preparation and makes it more engaging.	4.30	0.819	4	Strongly agree
12	Digital storytelling helps capture children's attention and develops their linguistic and creative skills.	4.26	0.881	5	Strongly agree
13	Digital storytelling aids in developing children's technical and social skills.	4.37	0.877	2	Strongly agree
14	Digital storytelling increases my interaction with children and encourages me to explore new teaching methods.	4.34	0.806	3	Strongly agree
15	Digital storytelling facilitates the learning process by providing an enjoyable and interactive educational environment.	4.41	0.758	1	Strongly agree
General mean		4.34	0.83	Strongly agree	

From Table 8, we conclude that the benefits early childhood teachers found when integrating digital storytelling into their teaching practices are with a degree of (Strongly Agree), a mean of (4.34), and a standard deviation of (0.83). This low value indicates homogeneous opinions among the study sample on the items of this dimension. In the first order, (Digital storytelling facilitates the learning process by providing an enjoyable and interactive educational environment), with a mean of (4.41), a standard deviation of (0.758), and a degree of (Strongly Agree). In the last order, (Digital storytelling helps capture children's attention and develops their linguistic and creative skills), with a mean of (4.26), a standard deviation of (0.881), and a degree of (Strongly Agree). From the results, we conclude that the benefits early childhood teachers found when integrating digital storytelling into their teaching practices are with a very high degree. It is known that using technology in teaching children can capture their attention and increase their learning motivation (Tzima et al., 2020). Children like to use technology in their daily lives at home; thus, using technology in schools could stimulate their learning motivation as well. Teachers could benefit from technology during story time to promote children's linguistic learning, vocabulary skills, computational thinking, creativity, collaboration, increased attention, and enhanced interaction (Kalantari, Rubegni, Benton, & Vasalou, 2023; Kalyva, 2024; Tzima et al., 2020). An addition, with the use of technology and media, teachers could encourage children to explore new and different ways of learning, and to facilitate learning through providing an enjoyable and fun way of learning in educational settings (Indriani & Suteja, 2023). DST provides teachers with an additional way of teaching technique beside their traditional way.

5.2.2. Challenges

Table 9. Means and standard deviations to the challenges.

No.	Item	Mean	Standard Deviation	Rank	Degree
16	Lack of sufficient training on using digital storytelling tools and software.	4.42	0.717	3	Strongly Agree
17	The time available for me to create or integrate digital storytelling into the busy schedule is limited.	4.41	0.737	4	Strongly Agree
18	I face difficulties managing children's use of digital devices during digital storytelling activities.	4.53	0.651	1	Strongly Agree
19	There are concerns about excessive screen time for children when using digital storytelling.	4.26	0.844	5	Strongly Agree
20	The costs associated with acquiring the necessary tools or software are considered a barrier.	4.47	0.773	2	Strongly Agree
General mean		4.42	0.74	Strongly Agree	

From Table 9, we conclude that early childhood teachers face significant challenges when integrating digital storytelling into their teaching practices, with a degree of (Strongly Agree), a mean of (4.42), and a standard deviation of (0.74), indicating homogeneous opinions among the study sample on this dimension. In the first order, (I face difficulties managing children's use of digital devices during digital storytelling activities), the mean is (4.53), with a standard deviation of (0.651), and a degree of (Strongly Agree). In the last order, (There are concerns about excessive screen time for children when using digital storytelling), the mean is (4.26), with a standard deviation of (0.844), and a degree of (Strongly Agree). From these results, we conclude that early childhood teachers encounter high degrees of challenges when integrating digital storytelling into their teaching practices. Teachers may face difficulties with technology, and some might lack proper knowledge about how to effectively use technology in teaching and learning (Rahiem, 2021). The challenges reported by teachers were: the need for training on using digital technology software and tools, the amount of proper time children need to spend on computers or tablets and screens, and managing children in the classroom (Aditya, Permadi, Andrisyah, & Hernawati, 2024; Rahiem, 2021; Shemy, 2020). Further, teachers are concerned about the high costs of technology and media tools. Many teachers indicated that creating digital stories is time-consuming due to their limited time caused by other schoolwork they have to accomplish (Quah & Ng, 2022; Sun, 2019).

The fourth question: What is the impact of digital storytelling on children's engagement, creativity, and narrative skills in early childhood education? To study this impact, means and standard deviations were calculated for the fourth axis items as follows.

Table 10. Means and standard deviations for the items of fourth axis.

No.	Item	Mean	Standard Deviation	Rank	Degree
21	Digital storytelling significantly increases children's engagement in classroom activities.	4.15	0.884	2	Agree
22	Digital storytelling stimulates children's creativity and imagination through creating their own stories.	4.04	0.846	3	Agree
23	Digital storytelling helps children develop their narrative skills (story structure, sequencing, characters).	3.93	0.870	4	Agree
24	Digital storytelling enhances children's ability to express their thoughts and feelings in innovative ways.	4.27	0.793	1	Strongly Agree
25	There's a noticeable change in children's creativity or narrative skills after using digital storytelling.	3.85	0.892	5	Agree
General mean		4.05	0.86	Agree	

From Table 10, we conclude that the impact of digital storytelling on children's engagement, creativity, and narrative skills in early childhood education with degree (Agree), mean (4.05), and standard deviation (0.86), shows low value, indicating the homogeneity of opinions among the study sample on the items of this axis. In the first order (Digital storytelling enhances children's ability to express their thoughts and feelings in innovative ways), with a mean (4.27), a standard deviation of (0.793), and a degree of (Strongly Agree). In the last order (There's a noticeable change in children's creativity or narrative skills after using digital storytelling), with a mean of (3.85), a standard deviation (0.892), and a degree of (Agree). From the results, we conclude that the impact of digital storytelling on children's engagement, creativity, and narrative skills in early childhood education is high. When children use technology in classrooms, their engagement significantly increases (Yilmaz & Sığirtmaç, 2023). DST stimulates children imagination and becomes creative when creating their own stories, or even when discussing exciting once (Metin, Kalyenci, Başaran, Relkin, & Bilir, 2025). Also, DST benefits children in developing their narrative skills and expressing feelings and thoughts (Adara, 2020; O'Byrne et al., 2018; Towndrow & Kogut, 2020). Teachers illustrated that there is positive development in children's narrative skills and creativity after integrating digital technology into their teaching practices.

The fifth question: How can digital storytelling foster media literacy and ethical understanding among early childhood children? To study how digital storytelling fosters media literacy and ethical understanding among early childhood children, means and standard deviations were calculated for the fifth axis items as follows.

Table 11. Means and standard deviations to the items of fifth axis.

No.	Item	Mean	Standard Deviation	Rank	Degree
26	Digital storytelling helps children understand that digital content can be created and modified (A basic concept of media literacy).	4.39	0.646	1	Strongly Agree
27	Digital storytelling contributes to instilling ethical values (Such as honesty, cooperation, respect for others) through story content.	4.26	0.709	2	Strongly Agree
28	Digital storytelling enhances children's ability to distinguish between "real" and "fictional" stories in a digital context.	4.18	0.733	3	Agree
29	Digital storytelling can be a tool for teaching children responsible for technology use.	4.02	0.887	4	Agree
30	Digital storytelling is used to discuss concepts like privacy and safety when children use digital devices.	3.91	0.902	5	Agree
General mean		4.15	0.78	Agree	

From Table 11, we conclude that digital storytelling fosters media literacy and ethical understanding among early childhood children with a degree (Agree), mean (4.15), and standard deviation (0.78), indicating the homogeneity of opinions among the study sample on the items of this axis. In the first order, (Digital storytelling helps children understand that digital content can be created and modified, a basic concept of media literacy), with a mean (4.39), a standard deviation of (0.646), and a degree of (Strongly Agree). In the last order, (Digital storytelling is used to discuss concepts like privacy and safety when children use digital devices), with a mean of (3.91), a standard deviation (0.902), and a degree of (Agree). From the results, we conclude that digital storytelling fosters media literacy and ethical understanding among early childhood children with a high degree. Technology and media tools can create an understanding for children that digital content is created and modified by humans. It also helps children understand the difference between what is real and what is fictional events (Castillo-Rodriguez et al., 2022; Choo, Abdullah, & Nawi, 2020). DST contributes to building ethical values such as respect, responsibility, honesty, fairness, trustworthiness, caring, cooperation, and citizenship through creating stories like these (Samuel, 2024; Theodosiadou, 2019; Tzima et al., 2020). It also can be a tool to teach children how to be responsible of using technology wisely as well as teach them about digital privacy and safety (Bilici & Yilmaz, 2024; Kaptan & Cakir, 2025; Voillot et al., 2024).

6. Conclusion

Overall, the research findings indicated that digital storytelling enhances and promotes children's academic and social development and learning in an interactive and interesting way. This study has empirically demonstrated that children's reading, digital literacy, and social development can be effectively supported by a framework that combines organized instruction with oral and digital storytelling and play-based activities. Based on the previous

discussions, it is evident that educators should consider that children's characters are inherently drawn to enjoyable activities when offering stimulation to them. In this context, digital storytelling acts as a crucial tool and platform to make the child's learning experiences pleasurable. Typically, digital storytelling in Saudi early childhood education is implemented using basic digital technology tools. These tools can improve a narrative or a fairy tale by making it more enjoyable, captivating, and interactive.

Furthermore, the research findings indicated that early childhood teachers value and believe in the benefits of technology not only for children's education but also for their teaching practices, despite the challenges they usually face. Early childhood teachers benefit from digital technology during story and other learning times to stimulate children's literacy learning and promote their social development, and also as a different teaching method that grabs children's attention and curiosity.

Future research could explore creating a collection of activities to reduce the novelty impact and maximize the potential benefits that digital storytelling activities could provide to both children and teachers.

7. Implications

The study's findings have important implications for policymakers, teachers, educators, and curriculum designers. Early childhood teachers' positive attitude toward using digital technology during story and learning times to promote children's academic literacy and social development could encourage policymakers to create digital teaching guidelines for early childhood teachers, guiding them on when and how to use digital technology appropriately to support children's learning and development.

For educators and teachers: integrate digital storytelling into weekly or bi-weekly lesson plans across various subjects to maximize its impact on academic and social development, and utilize diverse digital storytelling tools and apps (e.g., Storybird, Book Creator, ChatterPix Kids) to maintain children's engagement and suit varied learning objectives.

For policymakers and curriculum designers: provide continuous professional development workshops for teachers on effective digital storytelling pedagogies and tool usage, adjust curriculum schedules to allow teachers sufficient time for planning, creating, and implementing digital storytelling activities without feeling pressured, and design curriculum units that naturally blend digital storytelling with other subjects.

8. Limitations and Future Research Directions

The study was conducted in Riyadh, Saudi Arabia, limiting the generalizability of findings to other regions of Saudi Arabia. Regions such as the south, north, and west need to conduct similar research to benefit from and compare their findings. Also, qualitative research provides more statistical findings and involves no social interaction, thus,

Research on similar topics needs to be conducted using qualitative methodologies such as observation, interviews, focus group interviews, and more to hear, observe, and document individuals' experiences.

Future research needs to be performed on similar topics in other regions of Saudi Arabia to explore their digital practices and experiences for both teachers and children. Likewise, a qualitative methodology is recommended to document each teacher's perspective and provide narrative and rich content, which could reveal more complexity or even positivity. Further, similar research could be conducted in one sector: private, public, or international schools, to offer unique and specific experiences.

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