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The Power of Digital Storytelling: Enhancing Cognitive Engagement

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Abstract: *The growing demand for innovative teaching methods finds the potential of digital storytelling in enhancing cognitive engagement among learners. Digital storytelling is a medium that combines visual, audio, and narrative elements to create interactive learning environments. In conducting the study, an embedded qualitative research design including both qualitative and quantitative methods was used to consider the relevance of developing the cognitive engagement of kindergarten pupils in Pampanga. By conducting interviews with kindergarten teachers based on their experiences and own perspective, there was further supplementing and validation by distributing a survey questionnaire, which also included classroom observations to analyze the practical implementation of digital storytelling and how it affects pupil engagement. The results showed that digital storytelling maintained attention, fostered active thinking, and promoted active participation among pupils. However, other challenges identified are limited teacher training, lack of technological resources, and diversity of learning needs. Efforts should then be made hand-in-hand among teachers and other stakeholders to train and equip the latter with skills that will help them employ digital storytelling techniques. This research study is meant to prove how digital storytelling can be integrated with the traditional teaching method to foster effective learning for learners.*

Keywords—early childhood education; digital storytelling; cognitive engagement, multimedia learning; innovative teaching strategies

1. INTRODUCTION

With the current digital world, storytelling has been continually transformed into an effective and dynamic educational tool for teaching and learning. Digital storytelling (DS) refers to the combination of traditional stories and multimedia content that includes text, images, audio, animation, and video that create an immersive learning experience and engage learners for sustained attention (Robin, 2016; Smeda et al., 2014). It is particularly effective for young learners, who are digital natives, and require an engaging and interactive approach to their learning journey. Digital storytelling has the ability to enhance cognitive engagement, making learning both enjoyable, interesting, and impactful for early childhood education (Leu et al., 2019).

Storytelling, a well-known effective tool for language and literacy development, has been enhanced through digital tools such as computers, cameras, audio recorders, or any technological tools. These digital elements support early childhood education by improving language skills, enhancing communication skills, promoting creative thinking, and fostering social-emotional and moral development (Cremin et al., 2018; Zomer & Kay, 2014). Digital storytelling has also been proved to assist a child in the understanding of complex academic ideas like mathematics and science and enormously aid in school preparation, especially from the side of children from underprivileged places (Casey et al., 2008; Wright et al., 2001). Key highlight of digital storytelling is that its use of "multimodal literacy" and "narrative immersion," that can make it engaging to learners through a combination of visuals, animations, sounds, and interactive characteristics. These elements not only stimulate creativity, and critical thinking but also aid in improving memory retention and improve attention (Korosidou & Griva, 2021). Digital storytelling tools like interactive and engaging storybooks, websites, apps and multimedia presentations encourage young learners to engage actively with the material that enhances their ability to focus on sequencing and comprehension.

Moreover, digital storytelling can be both a solo, whole, and collaborative activity, promoting communication, teamwork, and shared creativity especially with sequencing of the story. It provides opportunities for children to work together, share ideas, and give feedback, thus strengthening their social skills while also improving the learning outcomes (Sun et al., 2017). Despite these advantages, challenges still remained, such as limited access to technology in underserved areas and the need for especially better digital literacy and skills among educators (Khan et al., 2012; Hinostroza, 2018). In addition, concerns about the overexposure to screen media affecting children's attention span and social interactions are also growing because of this techy material for learning (Landhuis et al., 2007; Blackwell et al., 2014).

However, there are successful examples and evidence of how digital storytelling has been adapted to address these challenges. For instance, in Jakarta, a storytelling-art-science club uses digital storytelling in a contextualized manner to teach moral, social, emotional, and especially the main academic lessons. This has inspired schools and countries to adopt similar strategies and methods, highlighting digital

storytelling's transformative potential in early childhood education (Rahiem, 2023). Through such initiatives, educators are finding ways to make digital storytelling a tool that enhances and improves, rather than distracts from children's learning experiences.

Central to the effectiveness of DS is the idea of sustained attention. The integration of multiple modes of communication in learning—such as text, pictures, animations, sound, and video—encourages students to remain engaged, requiring them to process content in many ways. This is a multimodal approach that raises cognitive, linguistic, and media literacy skills as students move through various modes to create well-balanced narratives (Anderson et al., 2018; Kress, 2003; Unsworth, 2001). When carrying out careful decisions and ideas regarding content development and structure, the students have to maintain their attention for deeper cognitive processing in both while and after learning (Wu & Chen, 2020).

The interactive nature of digital storytelling supports sustained attention in the process. Active participation of the students in the development and revision of their own digital stories raises motivation and focus while making the learning experience more meaningful and impactful. This is in accordance with Vygotsky's Zone of Proximal Development (ZPD) in 1978 and Piaget's symbolic representation in 1953, where scaffolding plays a central role in the learning process and there should be tasks appropriately challenging students to encourage greater cognitive engagement.

In that respect, although education is becoming much more inclusive lately, especially for today's people, the digital storytelling role that supports diverse learners has become even more important. Technology-enhanced learning, most especially digital storytelling, has become a strategic resource in support of learners with disabilities in inclusive education (Hersh, 2017; Sánchez-Serrano et al., 2020). The researchers stress that teacher training in ICT, digital literacy to properly use digital storytelling for the learners with special needs is entirely important (Fernández-Batanero et al., 2019). The latest research confirmed that digital storytelling is a modern tool for teachers' professional development in inclusive education, equipping them with the skills and strategies to involve all learners in learning (Li & Wong, 2021).

Early childhood education can benefit from the sequential use of digital storytelling, which has the potential to encourage sustained attention, cognitive and language development, and facilitate inclusive education practices. As this method continues to evolve in time, its impact on young learners, particularly those in disadvantaged groups, will more likely increase, providing them with the opportunities for more meaningful, fun and engaging learning experiences that are essential for their future success in education.

This storytelling, as a continuous and more transformative pedagogical tool, connects thought and language. Vygotsky emphasized that in learning, thought is deeply linked with language. Drawing on Vygotsky's socio-cultural theory, storytelling fosters language development through social interaction, dialogical exchanges, and scaffolding within the ZPD. In this context, storytelling serves as a mechanism for developing cognitive tools and acquiring language, facilitated by more knowledgeable individuals (Vygotsky, 1978).

Cognitive Development Theory by Piaget contrasts with Vygotsky, where it places the locus of attention on the child's actions and interactions with both the natural and social environment in constructing knowledge. Piaget indicates that at the preoperational stage, children aged 2-7 use symbolic play that is significant in literacy development. Storytelling is appropriate with Piaget's theory where children are afforded the chance to engage in symbolic representations through both words and images, thereby helping the children become familiar with the written language while at the same time encouraging critical thinking and memory (Piaget, 1964).

A synthesis of related literature reveals a clear divide in the findings regarding the effectiveness of digital storytelling in early childhood education. Anderson (2020), Stevens and Walker (2021), and Garcia (2022) emphasized the positive impact of digital storytelling, highlighting its ability to foster creativity, improve focus and critical thinking, and enhance retention in learners. These researchers concluded that digital storytelling can increase the engagement of learners by combining visual, auditory, creative and narrative elements to simulate multiple senses, which is beneficial for learning of young learners. On the other hand, Smith (2023) presents a different view, arguing that digital storytelling may not be as effective, as other authors proved for all learners, especially those with limited access to technology or those who may struggle with the digital tools involved. Smith's study suggests that such barriers can hinder learners' engagement and learning, particularly in less-resourced backgrounds.

Despite the existence of disparate studies like with Smith's, which claim that digital storytelling may not always be known as effective or its negative impact to the education of learners, the researchers still remained motivated to pursue this study due to their belief in the potential benefits of this digital storytelling in enhancing cognitive engagement for young learners. The integration of technology in education has shown positive results in improving learner engagement and creativity in other matters, which gave the researchers the motivation in exploring how this digital storytelling could specifically contribute to learners' learning in early childhood education. Furthermore, the positive feedback from teachers and learners in their study also highlighted the significant benefits of digital storytelling, offering a strong rationale for continuing the research. The contradiction in existing literature sparked the researchers' curiosity, eagerness, which prompted them to contribute further to the body of knowledge on this topic and its role in fostering deeper learning and engagement, especially with young learners.

2. AIM OF THE STUDY

This study aims to provide an in-depth exploration of the role of digital storytelling (DS) in enhancing preschool cognitive engagement by examining the experiences, interactions, and outcomes between teachers and pupils in the classroom. It seeks to identify key factors, challenges, and implications that contribute to improved educational outcomes and engagement, with a particular focus on sustaining attention among preschoolers.

The study aims to address the following specific objectives:

1. What is the perception of preschool teachers regarding the effectiveness of digital storytelling (DS) as a tool for enhancing cognitive engagement with a specific focus on attention in preschoolers?
2. What teaching strategies do teachers use when integrating digital storytelling in the classroom to enhance cognitive engagement?
3. What factors influence the effectiveness of digital storytelling in enhancing cognitive engagement in preschoolers?
4. What challenges do teachers face when implementing digital storytelling in their lessons to support cognitive engagement?
5. What are the implications of using digital storytelling on cognitive engagement, specifically the attention of preschoolers in educational settings?

3. METHOD

3.1 Research Design

The researchers utilized an embedded quantitative case study design to analyze the role of digital storytelling (DS) in fostering cognitive engagement, particularly focusing on children's attention. Through semi-structured interviews, classroom observations, document analysis, and survey questionnaires, the study delved into the practices and interactions between teachers and pupils, capturing the authentic dynamics of DS in a natural classroom setting. By focusing on a select group of preschool educators and their pupils, the research aimed to reveal the complexities of how DS impacted cognitive engagement and overall classroom performance. The embedded case study design offered a strong framework for exploring complex, real-world situations, allowing for an in-depth understanding of the participants' perspectives and the context in which DS was integrated (Baxter & Jack, 2008).

3.2 Participants

The participants were the selected preschool teachers from the province of Pampanga who have ample experience in integrating DS into their teaching practices. Participants were able to fulfill the required selection criteria: 1.) at least two years experienced preschool teaching; 2) demonstrated consistent use of DS in the instruction of literacy daily for at least 10 minutes; 3) used said method for a minimum of a year; 4) completed a degree either in Early Childhood Education or a Elementary Education major in Preschool, or has an ongoing master's degree course in Early Childhood Education; and 5) participated in at least one seminar, training, seminar-workshop, or practice on digital tools for storytelling. Eight (8) participants were purposively selected to accommodate the diversity of the perspectives in the study. Smaller sample sizes of 5 to 8 can effectively facilitate an in-depth exploration and analysis of complex and structure phenomena (Creswell & Poth, 2018). The classroom observations focused on practices and in the interactions between the participants and their pupils during digital storytelling sessions, hence enabling the researchers to get valuable insights into how DS promoted cognitive engagement. The research study was conducted in preschool classrooms where DS was integrated into the curriculum, thus providing a genuine environment to understand how DS altered cognitive engagement.

3.3 Instrument

Semi-structured interview guide and survey questionnaires were the major data collection tools for this study that focused on the core issues of how digital storytelling (DS) increases preschoolers' cognitive engagement in classroom settings. The interviews followed a structured approach consisting of four (4) distinct levels where each level was focused on an area of interest. Within each level, targeted questions were created, and follow-up questions were also employed to better explore the participants' experiences and perspectives in greater depth of the study.

Survey questionnaires were also adopted to supplement qualitative data to take all of the additional insights into participants' perceptions and experiences regarding DS. A four-point Likert scale was used in measuring the extent of agreement or frequency of some behaviors and attitudes related to DS. Both semi-structured interview questions and survey questionnaires for the data gathering were created by the researchers and were validated for relevance, clarity, and reliability by the experts. The quantitative method helped not only to justify and confirm the qualitative data but also offered a broader comprehension of the variety of themes present in the interviews (Fowler, 2014).

3.4 Data Collection

The researchers followed a structured method for data collection. First, approval from the Dean of the College of Education was sought through a formal letter outlining the study's objectives, purpose, and more supporting details of the study. When permission was finally granted, the researchers visited the schools to meet with the principals, requesting authorization to conduct face-to-face interviews with the teachers who participated in the study.

After obtaining the approval of the principals, the researchers visited the classrooms with the pupils to explain the study's objectives, purpose, implications, and the

participants' right to withdraw anytime if they want. A Parental Assent Form for Child Participation in Research was also provided to better ensure parents were informed and to protect the children's involvement in the study.

Data collection employed four (4) primary processes to ensure validity and depth: (1) semi-structured interviews with preschool educators to gather their insights and perspectives on DS; (2) classroom observations to document teaching strategies and pupil performance during DS sessions; (3) document analysis like lesson plans, teaching materials, and DS content; and (4) survey questionnaires to better capture additional perspectives on the effectiveness of DS to preschoolers in enhancing cognitive engagement, specifically their sustained attention.

The survey questionnaires utilized a four-point Likert scale to quantify the degree of agreement or the frequency of the specific behaviors and attitudes related to DS. This quantitative approach was essential and crucial for triangulating the qualitative data gathered from the interviews and observations, thereby enhancing the credibility and validity of the findings (Fowler, 2014).

Each interview lasted about 20–30 minutes, was audio-recorded with consent of the participants, and transcribed for analysis. Observations included descriptive field notes to capture teaching strategies and the pupil engagement, while document analysis provided supplementary connection on how DS was integrated into the preschool curriculum.

Moreover, data saturation was also reached when all eight (8) participants were interviewed. Data saturation is when no new information or themes arise from further data collection, and that further interviews would probably be redundant if they occurred (Guest, Bunce, & Johnson, 2006). This took place during the interviews, when responses from participants became repetitive, and the researchers felt that data gathered was enough to capture participants' experiences about digital storytelling in early childhood classrooms. This methodological approach was supported by research highlighting the effectiveness of this method.

Semi-structured interviews allowed for more flexible yet focused discussions, as explained by Kallio et al. (2016). It offered an expanded, overall perspective on the teaching process using classroom observations and document analysis; therefore, allowing a finer level of scrutiny about the in-practice reality effects of DS (Creswell & Creswell, 2018; Bowen, 2009).

3.5 Ethical Considerations

The study adhered strictly to the ethical guidelines to protect the rights and integrity of participants. Informed consent was the basis of this research process; they knew and understood what the study intended to achieve, purposes, data collection methods, and they were given the right to withdraw at any given time with no form of repercussions.

In addition, written consent was sought before interviews, observations, and administering of survey questionnaires, and assent forms were provided to parents or legal guardians of the learners. These forms presumed the essence of the study, the kinds of observations and surveys obtained, and any benefits that might arise, clearly indicating that no intrusive interventions would be made.

Further, the researchers indicated their contact number in case of inquiries or concerns. Also, confidentiality was upheld. Personal information and the data collected were ensured safe and private in the hands of the researchers. Audio recordings, observation notes, and completed survey questionnaires were stored for secure and safety in locked locations accessed only by the researchers.

All the ethical practices were in accordance to the set guidelines by the Data Privacy Act of 2012, Republic Act No. 10173, that places emphasis on obtaining proper informed consent, confidentiality, and secured data management.

3.6 Data Analysis

Data analysis used the embedded quantitative case study design to explore the impact of digital storytelling on sustained attention of the learners. Qualitative data was analyzed following Braun and Clarke's (2021) thematic analysis, where the aim is to identify, analyze, and report themes in the qualitative data. For the quantitative part, the data analysis used two (2) tools: MS Excel 2019 and IBM SPSS Statistics Version 26. Descriptive statistics, such as the mean and standard deviation, were used to summarize and interpret all the data. The analysis started with the familiarization of the data, where transcripts from interviews, observation evidence, and documents were read and checked multiple times to gain meticulous understanding. These were coded in key phrases, words, and ideas by the means of open coding where the preliminary codes highlighted meaningful patterns or reiterative concepts to express the effects that DS may be having on the aspects of literacy and engagement within early childhood settings. Codes then took a wider context through these categories based on themes, specific to each objective; perception of effectiveness, interaction, experiences, challenge, advantage, and impact on the educational practices. The themes were reviewed for consistency and coherence in the research question, and alterations were also needed to better confirm that the evidence supports the discovered themes. Finally, themes' interpretation in existing literature for more insights on DS' role within preschool education was conducted.

The researchers used thematic analysis to process all the data collected from participants. Interviews that were recorded were transcribed in detail, with care taken to ensure accuracy between the recordings and transcripts. Responses and direct quotations were categorized by similarities, and themes were assigned to represent all these statements. These included the transcription of all the collected recordings, the identification of key points, coding these points, similar codes being grouped

together, and then assigning themes. The themes obtained from the analysis formed the basis of the study. For the pilot testing of the survey instrument titled "The Power of Digital Storytelling: Enhancing Cognitive Engagement," a questionnaire was distributed to thirty (30) different preschool teachers and not the actual participants.

Subscale Perception of digital storytelling contained three (3) items; Cronbach's Alpha was 0.909. Subscale Teaching Strategies contained three (3) items with the reliability score equal to 0.889. Subscale Success Factors contained three (3) items; the alpha value was equal to 0.818. The subscale of Challenges Encountered had also three (3) items and provided a reliability score of 0.823. Lastly, the Educational Outcomes subscale had a Cronbach's Alpha value of 0.878 across its three (3) items. The survey instrument generally had a Cronbach's Alpha value of 0.810, which meant that it had a good level of internal consistency across the fifteen (15) items (George & Mallery, 2019). These results showed that the survey instrument was good, reliable and appropriate for use in the study.

3.7 Trustworthiness And Rigor of the Data

This study adhered to the criteria set by Lincoln and Guba (1985) for qualitative research in ensuring the credibility and rigor of the data using four key criteria: first credibility, transferability, dependability, and confirmability. Credibility was achieved in the study by deeply engaging with all the participants, cross-checking data from different citations, and the use of member validation (Shenton, 2004). Even though transferability depended on ensuring a richer and more detailed description of the substance and population studied (Bitsch, 2005), researchers usually were stuck in the actual study while not being able to share the details with others adequately. With regard to dependability, an audit trail was kept that fully chronicled the process of research ensuring that the design was followed accurately and effectively (Cohen & Crabtree, 2006). Lastly, confirmability was enhanced through the use of reflective journals and peer debriefing to downplay biases, hence findings were grounded in the data (Lincoln & Guba, 1985). Collectively, these practices enhanced the quality, and consistency of the research design, making the results more reliable, valid and credible.

4. Findings And Discussion

This chapter presents an analysis of the findings from the study on the power of digital storytelling (DS) in enhancing preschool cognitive engagement. It highlights the impact of DS on sustaining attention based on data gathered through interviews, surveys, and classroom observations with teachers and pupils.

Teachers' Experiences with Digital Storytelling (DS) in the Classroom

Based on the problem statement for this study, the above category was designed. Kindergarten teachers offered their views and experiences about digital storytelling. After the analysis and process, three (3) themes emerged: visual and multisensory engagement, enhanced learning outcomes, and facilitation of critical thinking and imagination. Each theme has been discussed here for better realization of the objective of the present investigation.

Visual and Multisensory Engagement. Digital storytelling proved to be quite effective in the promotion of cognitive engagement as well as extended focus among preschoolers. Pictures, animations, visual colors, and sounds engage young learners for a longer time. According to Tarr and Nix (2020), the inclusion of vibrant visuals, engaging sounds, and effects in digital storytelling provides a multisensory experience that captures learners' attention and makes learning more stimulating and long-lasting. The dynamic combination of visual and auditory stimuli helps to create an immersive experience that supports effective cognitive engagement.

This concurs with the finding of Bers et al., (2020) whereby multimedia factors involved in DS significantly improved and enhanced the ability of children to focus and pay attention to engaging content and be able to focus on the related content.

Enhanced Learning Outcomes. DS allows preschoolers to acquire vocabulary and language, literacy, and storytelling skills from an early age. The interactive and engaging story elements of DS make it a perfect medium to introduce new words in meaningful context. This fact has also been confirmed by the studies conducted recently, like Lo, Liu, and Chou (2021), who stated that DS helps enhance vocabulary and strengthen language skills of children by allowing them to experience new words through an interesting, contextualized process of learning. Furthermore, DS promotes effective communication skills by enabling children to express their ideas and thought process and may retell stories, thus strengthening their overall literacy skills.

According to a research study done by Bers et al., (2021), DS majorly enhances children's language development due to exposure to more reception and production skills opportunities, making for better results on literacy achievements while learning. Further support for this claim is found in other studies conducted by Smith et al., (2020), where it is indicated that DS makes the learning environment dynamic and interactive; children connect to both spoken and written language, hence improving their vocabulary and narrative skills. Furthermore, it has been highlighted by Jones and Clark (2019) that the embedding of content DS in early childhood education encourages creativity, critical thinking, and even advanced communication skills. As children are orally creating their own digital stories, they exercise sentence building and the use of new words that promote verbal and written expression.

Facilitation of Critical Thinking and Imagination. Digital storytelling also enables preschoolers to predict what

would happen in a story and connect with the story in more engaging ways. Kucirkova et al., (2020) observed that digital storytelling gives children choices in the story that later stimulate imagination and problem-solving abilities. The interactive nature of DS compels children to critically think about the plot and characters and enhances cognitive and creative development.

Heath et al., (2019) also pointed out that interactive storytelling environments encourage preschoolers to engage in higher-order thinking by making predictions and reflecting on the story's content, which further supports their cognitive development.

Teaching Strategies with Digital Storytelling

According to the problem statement for this study, the above category was developed. Kindergarten teachers share their views regarding the use of digital storytelling and the teaching methods that emerged from the session on the content. After the analysis and process, four (4) themes were identified: discipline and attention management, integration with lesson objectives, interactive and engaging techniques, and readiness and creativity. Each theme was discussed below to better understand and achieve the objectives of the present investigation.

Discipline and Attention Management. An effective discipline and attention management are one of the crucial strategies that have to do with the use of digital storytelling (DS) content in the early childhood education setting. Teachers provide classroom routines like circle time. Techniques are deployed to maintain attention from learners through storytelling sessions. Berk (2021) affirmed that teachers who set clear routines and ground rules for transitions can improve the direction and participation of learners in the learning session significantly and effectively. This is augmented by effective teacher monitoring through a structured class environment with the use of signals to accumulate learners' attention so that they will remain engaging all throughout the digital storytelling session.

These strategies are in agreement with the research of Moreno and Mayer (2020), who claim that a well-managed environment allows for broader and deeper cognitive engagement by eliminating distractions, hence allowing children to focus more on the content of the story.

Integration with Lesson Objectives. Teachers ensure that the DS content aligns with their lesson objectives for the day, ensuring the story connects to real-life world or local settings. That way, the children understand and relate to the content material better. According to Garrison et al., (2020), contextualizing storytelling is essential in relating material to learner's lives, making it cognitively engaging by being personally meaningful and impactful. Content localizes more effective learning by closing the gap between what happens in the lesson of the story and what they have personally encountered.

This is supported by the research of Hsu et al., (2021) who mentioned that integrating digital storytelling with lesson objectives enhances engagement by making learning more interesting, contextual and applicable to real-world structure.

Interactive and Engaging Techniques. Some interactive techniques used in this regard are Q&A time, collaborative activities with throwing creative questions, role-playing, story mapping, and think-pair-share activities that would help the learners participate more in their learning activities and increase the cognitive engagement of the young learner. Nikolopoulou and Gialamas (2021) argued that such unique strategies can increase the active involvement of learners in the learning education process, promoting the critical thinking and social interaction of the children. Strategies like Q&A sessions can activate all their prior knowledge and motivate the students. The peer feedback and group activities encourage collaboration and reflection with the content.

This is supported by more research from Bers (2020) into further details on how these interactive techniques contribute to cognitive engagement, since they encourage the students to actively process and reflect on story content.

Teacher Readiness and Creativity. Teacher preparedness and unique creativity play a vital role in making digital storytelling effective for learning. Once the teacher gets mastery over the story, uses ways like an expressive voice, and actions to enhance the involvement of learners in DS. Huang and Yang (2022) argue that enthusiasm and creativity from the teacher's side in telling digital stories like using different voices, gestures, and emotions can easily capture the children's attention, thus making it possible to have a deep emotional connection with the story lesson. This keeps the children busy and strengthens their cognitive engagement in making the story vivid and memorable for their learning with the content.

This falls in line with Lim et al., (2020) who pointed out that when a teacher is well prepared, ready any time and creatively engaged with the content, there is a probability that young learners pay attention, memorize information, generate ideas and are more inclined to participate in a lesson.

Success Factors of Digital Storytelling in Enhancing Cognitive Engagement

As stated in the problem statement of this research, the above-mentioned category was created. The kindergarten teachers were consulted about their viewpoints and experiences related to the success factors of digital storytelling. Through analysis and the process, four (4) themes had emerged: teacher competency, technical factors, engagement strategies, and content relevance. Each theme was discussed below for better understanding and to achieve the objectives of the present investigation.

Teacher Competency. The competency of the teacher plays a significant role in the effectiveness of digital storytelling (DS) in enhancing cognitive engagement in

preschoolers. A teacher's ability to manage the whole classroom dynamics, use the storytelling tools effectively and successfully, and select appropriate content can make a big difference in the learning experience of their learners. Shin and Kim (2020) revealed that the abilities and skill of a teacher in controlling the classroom behavior and guiding students through interactive media will help maintain focus and engagement even if it is hard if they think. Additionally, effective storytelling relies on the extent to which the teacher applies the available tools to make learning experience effective by making the story move at the appropriate pace, clarify, if need be, make use of various media elements, and get the children involved in participation.

This is proved by Nguyen et al., (2021), with the investigation showing that well-trained and highly competent teachers in handling classroom management and employing digital tools would more likely engage students, include the material, and enhance cognitive outcomes when students engage in DS activities.

Technical Factors. The effectiveness and benefits of digital storytelling rely on some technical factors like internet connection, quality of the audio and visual elements, and physical setting in the classroom. Problems like slow internet speeds may affect learners' interest and engagement, thereby interfering with the smooth flow of the story. Besides, audio and visual qualities contribute much more to the good success of the students' ability to focus and connect with the story. Kucirkova et al., (2021) pointed out that technical reliability and the physical environment, such as lighting and seating arrangements, are essential to ensure a smooth storytelling time because these factors influence how well children interact with the digital content.

As Snyder and Mertens (2020) suggested, a good technical setup may minimize distractions in an attempt to sustain children's interest and concentration while participating in DS sessions.

Engagement Strategies. Interactive media, pausing for questions, unique colorful animations, pictures, and relatable stories are some of the effective engagement strategies when maintaining cognitive engagement. Hwang et al., (2021) stressed that through these interactive elements, including asking questions at the end of a paused story and more, enhance the critical thinking of a child and keep him more focused and involved with the narrative. Moreover, the very colorful visual effects which can be provided through animations and images are helpful in keeping children's attention so that better retention of the information and ideas will occur. All these strategies go hand in hand with the constructivist approach to learning experiences, where active participation and interaction are all key to cognitive development of the learners.

This is in agreement with Schunk (2022), who states that interactive strategies in digital storytelling can foster children's cognitive engagement by engaging them actively in the learning and teaching process and making them predict and reflect on the DS content.

Content Relevance. The relevance of the content and structure used in digital storytelling is very important in engaging preschoolers and enhancing their cognitive development and their engagement in class. Stories that are relatable, age-appropriate, and culturally material ensure that children can better connect with the material, which in turn engages their cognitive engagement. Ching et al., (2020) highlights that when children see a connection between the story and with their everyday lives, they are more likely to engage deep and effectively, and better retain the information. Select stories that are germane to the culture will also make people feel included as well as connected with the material being presented.

This is supported by Lim and Tan (2021), who observed that age-appropriate, culturally relevant material content in digital storytelling absolutely increases children's interest and engagement, leading to a more improved cognitive result.

Challenges Encountered in Implementing Digital Storytelling

As per the problem statement for this study, the above-mentioned category was made. The kindergarten teachers shared their perspectives and experiences on the challenges encountered in using digital storytelling. After the analysis and process, three (3) themes had emerged: time constraints, resource limitations, and technical issues. Each theme was discussed below to better understand and achieve the objectives of the present investigation.

Time Constraints. The specific time for making it through preparation with the content remains one of the significant issues that teachers experience in implementing digital storytelling (DS). One needs to identify sufficient time to make or localize materials that can be supportive of their lesson objectives for the day, thus resulting in the neglect of other teaching tasks. This suggests that time taken to create informative and unique interesting relevant digital stories is the struggle that many teachers are facing, more so, those whose other schedules are packed for the whole day according to Bakker et al., (2021).

This finding is in line with the study of Smith and Blankenship (2020), who observed that the extra workload involved in the production of digital storytelling content can limit its implementation and effectiveness for the day even when teachers recognize its educational value for children.

Resource Limitations. Teachers often face a problem of scarce free or low-cost resources and materials, and the high cost of tools and software needed to create or access digital stories on the internet. Inadequate availability of materials that are both age-appropriate and lesson-relevant further complicates the process as they are usually broad and for higher age mostly. Nguyen and Nguyen (2021) established that resource materials constraints are a significant barrier in

introducing a technology-based material for learners, especially in schools with limited budgets for educational technology.

This challenge has also been reeled out in Hew and Brush (2020) who observed resource constraints impede the ubiquitous acceptance of digital storytelling, with especially under funding conditions in learning contexts.

Technical Issues. Technical difficulties including unstable internet connections, poor-quality digital stories, and challenges accessing reliable resources contribute to a significant barrier to implementing digital storytelling effectively and efficiently. Unreliable internet sources disrupt storytelling sessions, breaking students' focus and interest with the session. Kucirkova et al., (2021) proved that technical reliability is critical for maintaining learners' attention and ensuring a smooth storytelling experience with the content.

These findings align with Mousavi et al., (2020), who recognized that technical issues are a common struggle of educators in technology-based teaching, often requiring teachers to prepare backup plans, downloaded with higher quality material which further increases their workload.

Educational Outcomes and Cognitive Engagement

As per the problem statement for this study, the above-mentioned category was made. The kindergarten teachers shared their perspectives and experiences on the educational outcomes of digital storytelling. After the analysis and process, two (2) themes had emerged: increased attention and retention and interactive and dynamic learning. Each theme was well-discussed below to achieve the objectives of the present investigation.

Increased Attention and Retention. Digital storytelling (DS) has appeared to sustain preschoolers' focus and attention during storytelling time and that enhances their memory retention with the material and lesson. The combination of visuals, sounds, and animations grabs the attention of children, making it easier for them to pay attention properly and remember the material. Shin et al., (2021) revealed that multimodal learning experiences, such as DS, activate multiple sensory domains, which improves cognitive engagement and helps children retain information better.

This is attributed by the works of Lim and Tan (2020) who find out that preschoolers using digital storytelling depict good memory recall capabilities, generate wonderful creative ideas while having better listening skillfulness as opposed to the ancient story-telling traditions. The active factors of the DS like excellent animations with imaginary objects, including similar characters who carry a natural-like image create and hold this focus.

Interactive and Dynamic Learning. It promotes an interactive and complex learning environment by encouraging collaboration, asking creative questions, and supports active participation. The more preschoolers are inspired to think critically and ask questions with confidence during or after the story, the more involved they will become. Hwang et al., (2021) established that DS presents more opportunities for children and teachers for two-way interaction, making the learners co-creators in the learning process rather than a passive recipient of education. It is this interactivity that helps them to improve their cognitive engagement and ability to concentrate in the learning process.

Kucirkova et al., (2021) also supports these findings, indicating how interactive digital storytelling supports preschoolers in making connections between the story and real-world concepts, thus enhancing a better focus and engagement in class.

In the quantitative aspect of this embedded qualitative research methodology, a survey questionnaire was also distributed to obtain additional data that was used to confirm and complement the qualitative results of the participants. The quantitative analysis, which excerpts a four-point Likert scale, measured participants' attitudes and behavior in relation to Digital Storytelling (DS). This way, the insight gathered through the qualitative method will be confirmed and strengthened, such that the outcome will be sound, reliable and credible. The integration of the quantitative data therefore played a significant role in validating the qualitative results, providing a broader perspective on the themes and patterns that emerged from the interviews.

Table 1. Perception of Digital Storytelling

Statements	Mean	SD	Interpretation
1. Digital storytelling effectively enhances pupils' sustained attention during lessons.	3.75	0.46	High
2. Digital storytelling positively influences pupils' sustained interest in learning activities.	3.75	0.46	High
3. Pupils demonstrate increased sustained attention when digital storytelling is integrated into lessons.	3.75	0.46	High
Grand Mean	3.75	0.44	High

Note: The computed means were interpreted using the following levels and their intervals: Low (1.00-1.74); Lower Average (1.75-2.49); Upper Average (2.50-3.24); and High (3.25-4.00).

The results on the perception of digital storytelling, as presented in Table 1, indicate that digital storytelling is perceived as a highly effective tool in enhancing pupils' sustained attention and interest during lessons in classroom settings. The statistical analysis shows that the mean score for all three statements was 3.75, with a standard deviation of 0.46, which suggests that participants consistently rated the effectiveness of digital storytelling as high. These results

imply that digital storytelling positively impacts both the sustained attention and interest of pupils during learning activities of the material.

In terms of the interpretation of the scores, the researchers consider the responses as indicative of a high perception of digital storytelling's effectiveness as a teaching tool for educators. As a result, the grand mean score of 3.75, along with the low standard deviation (0.44), shows consistency in the participants' perceptions. This reflects a general agreement that digital storytelling holds the potential to significantly enhance pupils' attention and engagement during lessons with the content.

Findings are supported by previous research by Mayer (2005) and Berk (2009) that highlighted the cognitive benefits of multimedia learning tools like the digital storytelling, which combine visual, animation, auditory, and narrative elements to maintain learners' attention. Additionally, the consistency of the responses across the three statements also suggest that pupils demonstrate a uniform perception of how digital storytelling affects their learning experience. These findings align with the study of Robin (2008), who found out that digital storytelling increases engagement by providing emotional and cognitive stimulation in learners, which leads to their sustained interest in lessons.

The results from the findings indicated that digital storytelling is not only effective in maintaining attention but also plays a role in fostering long-term interest in educational settings. The findings from this study, supported by existing literature, suggest that digital storytelling can be a valuable tool in enhancing the overall learning experience.

Table 2. Teaching Strategies

Statements	Mean	SD	Interpretation
1. I adapt my teaching strategies to incorporate digital storytelling for different learning needs.	3.75	0.46	High
2. Interactive elements in digital storytelling are essential to my teaching approach.	3.88	0.35	High
3. Digital storytelling helps me engage pupils with various learning styles.	3.63	0.52	High
Grand Mean	3.75	0.44	High

Note: The computed means were interpreted using the following levels and their intervals: Low (1.00-1.74); Lower Average (1.75-2.49); Upper Average (2.50-3.24); and High (3.25-4.00).

Results in Table 2 reveal that teachers highly perceive digital storytelling as an effective teaching method. Teachers clearly value digital storytelling with mean scores ranging from 3.63 to 3.88 for adjusting and to the various learning needs, engaging students with diverse learning styles and needs, and incorporating interactive elements. The highest mean score of 3.88 is observed in the statement regarding the essential nature of engaging elements in digital storytelling. The central mean of 3.75 highlights the importance of adapting teaching strategies to incorporate digital storytelling for different learning needs, while the lowest mean of 3.63 still reflects a high level of agreement on its role in engaging pupils with diverse learning styles.

The high mean scores, coupled with low standard deviations (0.35-0.52), indicate a uniform perception among the teachers that digital storytelling is an effective tool for enriching their teaching approach. It is in keeping with the study of Mayer (2005) and Robin (2008), who emphasized the advantages of multimedia tools in catering to the various learning styles and improving the learners' learning engagement.

Further, the high grand mean of 3.75 supports the notion that digital storytelling is perceived as an invaluable approach to creating an inclusive and interactive learning practice. Teachers agree that interactive elements with digital storytelling are crucial in keeping learners interested and enhancing the learning experience. These findings are in line with those of Berk (2009) and Schwamborn et al. (2014), who emphasized the effectiveness of interactive learning tools in promoting engagement and accommodating diverse educational needs. Overall, the results show that teachers find digital storytelling to be a vital tool in adapting lessons to meet the diverse needs of students and enhancing their learning experience.

Table 3. Success Factors

Statements	Mean	SD	Interpretation
1. The use of digital storytelling significantly enhances my pupils' sustained attention in the classroom.	3.75	0.46	High
2. Positive pupil responses encourage me to continue using digital storytelling.	3.75	0.46	High
3. Digital storytelling improves overall classroom engagement.	3.38	0.52	High
Grand Mean	3.63	0.49	High

Note: The computed means were interpreted using the following levels and their intervals: Low (1.00-1.74); Lower Average (1.75-2.49); Upper Average (2.50-3.24); and High (3.25-4.00).

Table 3 results show that educators perceive well the positive sides of digital storytelling, and thus mean scores for the side stand between 3.38 to 3.75, highly interpreted. The highest mean score of 3.75 is found in two statements: "The use of digital storytelling significantly enhances my pupils' sustained attention in the classroom" and "Positive pupil responses encourage me to continue using digital storytelling." These scores indicate that teachers confident in

digital storytelling are highly effective in maintaining pupil attention and motivating continued use as a result of positive student outcomes in their behavior and education.

The central mean score of 3.63 demonstrates the perceived effectiveness of digital storytelling in increasing the overall classroom engagement. The lowest mean score of 3.38, while still falling within the high interpretation range, indicates that teachers see opportunities for further improvement in classroom engagement through digital storytelling.

These results are consistent with study by Mayer (2005), which indicates that by joining all visual, audios, and interactive narrative components, multimedia tools such as digital storytelling cultivate learners' attention and promote more engagement and focus to them. In addition, the assumption that educators see digital storytelling as a useful tool for improving learner engagement and sustaining attention is supported by the overall grand mean of 3.63. This is in line with research by Robin (2008) and Berk (2009), who proved that digital storytelling encourages learner engagement and improves the educational process by making favorable reactions. These findings suggest that learners' engagement with digital storytelling creates a positive feedback loop that supports its ongoing benefits and use in the classroom.

Table 4. Challenges Encountered

Statements	Mean	SD	Interpretation
1. I find challenges in implementing digital storytelling that affect pupils' sustained attention.	2.88	0.64	Upper Average
2. I face difficulty in finding adequate training or support to use digital storytelling effectively with young learners.	2.88	0.64	Upper Average
3. I struggle to access or use digital storytelling tools in my lessons.	2.63	0.92	Upper Average
Grand Mean	2.79	0.72	Upper Average

Note: The computed means were interpreted using the following levels and their intervals: Low (1.00-1.74); Lower Average (1.75-2.49); Upper Average (2.50-3.24); and High (3.25-4.00).

The results in Table 4 emphasize the challenges encountered by educators in implementing digital storytelling in the classroom. The mean scores to all three statements were in the "Upper Average" range, with scores ranging from 2.63 to 2.88. This generally points out that teaching is moderately challenging about digital storytelling. More specifically, educators reported having problems related to keeping pupils' concentration sustained (mean = 2.88); getting enough training or guidance (mean = 2.88); and accessing or using digital storytelling tools (mean = 2.63). These challenges suggest that, although digital storytelling is perceived as effective and benefits to others, its implementation is not without struggles, particularly concerning technical support and teacher preparedness.

The grand mean of 2.79 is better at reiterating the concept that a large number of teachers face a good deal of moderately encountered difficulties while implementing the proper use of digital storytelling in class. These findings agree with Schwamborn et al., (2014), who have demonstrated that digital storytelling, although having various benefits, will fail to be correctly implemented in teaching if there are problems such as poor training, availability of tools, or technical support.

Berk (2009) also highlighted that teachers might find it difficult to use interactive tools appropriately, especially when resources are inaccessible or limited or when there is inadequate professional development for educators. Such findings suggest that addressing these challenges through training and better access to resources could help increase the effectiveness of digital storytelling in the classroom.

Table 5. Educational Outcomes

Statements	Mean	SD	Interpretation
1. Digital storytelling has led to noticeable improvements in my pupils' sustained attention during lessons.	3.50	0.53	High
2. Digital storytelling has helped improve pupils' ability to focus for longer periods on lesson activities, especially during interactive storytelling sessions.	3.38	0.52	High
3. Parents/guardians have expressed satisfaction with their children's progress due to digital storytelling.	3.25	0.46	High
Grand Mean	3.38	0.49	High

Note: The computed means were interpreted using the following levels and their intervals: Low (1.00-1.74); Lower Average (1.75-2.49); Upper Average (2.50-3.24); and High (3.25-4.00).

Table 5 conveys that digital storytelling has a positive effect on learning outcomes as all the claims achieved mean scores at the "High" interpretation level. The statement, "Digital storytelling has resulted in significant changes in my students' ability to maintain attention during class," had the highest mean score of 3.50, indicating its effectiveness in improving learners' attention and engagement.

On the other hand, the statement "Digital storytelling has aided pupils in maintaining longer periods of focus on

lesson activities, particularly with interactive storytelling activities," had an average score of 3.38, and thus was making a significant input into the length of time focused in class.

While the statement with the lowest average score was "Parents/guardians have been happy with their child's progress based on digital storytelling," at a mean score of 3.25, hence a high score for parental agreement. With a grand mean of 3.38, the data prove that digital storytelling is an effective technique for increasing attention, focus, and overall educational result, as research conducted by Mayer (2005), Robin (2008), and Schwamborn et al. (2014) suggests.

4,1 Synthesis of Interpretation

In this research study, data saturation was achieved after conducting all interviews with eight (8) participants, even though only seven were needed for this study. The researchers made sure that sufficient themes were identified and analyzed-well to provide a complex and comprehensive understanding of the topic. When the researchers reached a point where additional data collection no longer introduced new insights, they confirmed that saturation had been reached. The responses from both teachers and learners were enough, with similar feedback on how digital storytelling would enhance cognitive engagement, especially the sustained attention of learners.

From the collected data, it was clearly open that the participating teachers shared different, new, and valuable experiences regarding the use of digital storytelling (DS) in their classrooms. Their statements emphasized how DS effectively engages young learners by not only capturing their interest but also addressing their different preferences and needs when it comes to the lesson in education. The results of the study indicate that DS is not only a tool for telling stories but also a very effective material to be used in fulfilling children's developmental and educational needs.

Teachers opined that although DS is very effective in holding the attention of the students, its impact is infinitely multiplied when it is an active participant of teaching and learning process. This way, the storytelling experience is not passive but dynamic and interactive. Teachers told themselves that they are a co-facilitator with the help of DS. In that case, they matter more during the sharing of meaningful and interactive sessions. They mentioned that, when teachers are completely engrossed in themselves and in a creative use of DS, the cognitive, emotional, and social needs of the children are dealt with. On the other hand, they also added that, in case it was not carried out appropriately and efficiently, children lose their interest over time and that highlighted teacher preparation and material involvement. It is indicated by this research that DS holds precious possibilities of improvement of pupils' abilities, as well as aspects in the broader dimension, like their literacy and thinking and their capabilities of collaborative practices.

It was eminent that DS promotes a holistic approach to teaching and learning, enabling children to enhance their comprehension, vocabulary, and engagement in classroom undertakings. Furthermore, teachers reported that DS can become an effective means of classroom management, such as disciplining and managing pupils' attention. Therefore, when incorporated with other topics for lessons, educators would be able to improve the deeper and wider understanding as well as the long-lasting experiences of learning. Nonetheless, difficulties were also identified, particularly regarding the important teachers' proficiency in using DS.

Some educators admitted to using DS only for compliance and in emergency, without fully exploring its potential. This gap in knowledge underscores the need for continuous professional development, seminars and training in DS. Teachers emphasized the value of workshops and seminars in enhancing their creativity and ability to maximize DS as a teaching strategy and its potential. Training opportunities could encourage more and empower other teachers to create more engaging materials and content and will address the specific needs of their learners more effectively.

To conclude, DS proves to be an effective and effective tool for early childhood education, capable of promoting and enhancing cognitive engagement, literacy development, and also classroom management. However, its effectiveness lies in the teacher's ability to creatively and purposefully integrate it into their teaching practices. To maximize the potential of DS, teachers must continuously develop their skills and explore innovative approaches, ensuring that they not only comply with educational standards but also meet the holistic needs of their learners. As the study demonstrates, the successful use of DS depends on the synergy between the tool and the teacher, with the ultimate goal of creating meaningful and engaging learning experiences for children.

The figure below represents the emerging framework of this study, which illustrates the categories and themes identified from the interview questions: three themes under teachers' experience with DS, four (4) themes under teaching strategies with DS, four themes under success factors of DS, three (3) themes under challenges encountered in DS, and two themes under educational outcomes of DS.

Figure 1. Emerging Framework for Synthesis and Interpretation (Researcher-Made)

5. Conclusions, Limitations, And Recommendations

This chapter presents the overall findings of the analyzed embedded quantitative case study data, resulting in conclusions, limitations, and recommendations that answer the problem statements of the study.

5.1 Conclusions

This study demonstrated that digital storytelling significantly enhanced cognitive engagement among preschoolers, particularly with regard to their ability to maintain attention. In general, some of the most important findings obtained from this research are:

1. Early childhood teachers embrace digital storytelling because it is believed to be effective in engaging students cognitively as well as effectively. Because of the visual effects, sounds, and animations involved, the attention capture and active involvement with the narratives become very key. Teachers think that DS strategy enriches their lessons and leads to better understanding; therefore, its practice becomes a big part of any early childhood educator's toolkit.
2. Teachers use various techniques to leverage the benefits of digital storytelling in the classroom. These include content that is suitable for the age group and appealing, pauses during the story for discussion, predicting and reflecting, and vocabulary building activities. Group activities and group tasks that are part of storytelling also improve learning.
3. The success of digital storytelling greatly depends on teachers' creativity, readiness, and technical skills. If teachers are properly prepared and are provided with resources then it can create engaging and meaningful experiences in DS that will significantly enhance the level of cognitive engagement. Other contributory factors include availability of technology, teacher competency, and institutional support for the tool.
4. However, despite these benefits, the integration of DS in the teaching practice of educators remains a challenging process. Among other things, teachers face difficulties with time management, limited availability of resources, and technical issues while using DS. Moreover, insufficient training and professional development opportunities are limiting factors in teachers' full adoption of DS into their practice. These are barriers that must be addressed in order to unleash the full potential of digital storytelling in early childhood education.
5. Digital storytelling enhances significantly the cognitive involvement of preschool children by improving attention, motivation, and developing critical thinking in them. Learners are afforded a more exciting and dynamic teaching environment, an opportunity to equip themselves with these skills such as vocabularies, comprehension, amongst others. Continual investment through teacher training in digital storytelling besides resources and other technical support measures must be a guarantee for effectiveness. These will make educators better in the use of DS, so it will remain a powerful instrument in the preschooler's cognitive and emotional development.

In a nutshell, digital storytelling is seen as an innovative teaching application during early childhood education. However, this depends on the readiness of teachers, access to resources, and support from the institution. Through mitigating some of the challenges reflected in this paper, educational institutions can, therefore, create an environment in which digital storytelling flourishes and contributes to the wholesome development of the young learner.

5.2 Limitations

This study has several notable limitations that should be considered when interpreting the findings:

1. The research was largely conducted on kindergarten teachers and their pupil therefore, the results do not necessarily generalize to other schools or grade levels, especially in different educational contexts or regions.
2. This study was teacher centered with a minimum amount of pupil classroom observations. In turn, perhaps the pupils' experiences or their active participation in digital storytelling was not adequately captured.
3. For other participants, some necessary lesson plans were not available to the teachers because they were implementing the new curriculum, which required specific themes. This limitation may have impacted the richness of the data acquired.
4. In as much as it was conducted over a limited period, the investigation could not engage with other related dimensions of digital storytelling, such as its long-run effects on learning by students or its effectiveness within different subject fields.
5. Although the study reached its sample size as required with at least seven (7) participants, there were limited numbers of teachers within the time set, which barred the exploration of various teaching experiences and the applicability of digital storytelling in multiple school levels.
6. The research did not go deep in the technical issues of creating digital stories. It was common that many teachers relied on YouTube instead of making their own digital products, which puts a limitation to the study regarding the wider implications of digital storytelling in education.

5.3 Recommendations

Based on the conclusions drawn from the study, the following statements are hereby recommended:

1. The potential of digital storytelling in various education areas, including literacy, numeracy, and other cognitive skills, could be further explored to understand its efficacy in different types of learning. This would lead to a wider understanding of how it influences a range of outcomes in learning and,

consequently, its potential in supporting holistic education.

2. Administrators should arrange webinars or online workshops for teachers. These should be free, accessible, and targeting the use of digital storytelling tools as well as making them create new stories for use in the classroom environment. Such programs can improve the practices of teaching because they create awareness and also hands-on training.
3. Specialized training programs should be devised to bridge the knowledge and skill gaps of teachers. These programs will equip educators with the tools and expertise required for the effective design and implementation of digital stories. Teachers must be encouraged to create their own digital stories and apply them in classrooms while providing an assessment from both teacher and pupil perspectives.
4. Improved digital storytelling in education requires collaboration among technology experts, curriculum developers, and teachers. Partnerships might lead to robust, user-friendly platforms that match educational standards with technological advancement and ensure that digital storytelling is not only effective but also accessible to both teachers and students.
5. The Department of Education (DepEd) must include digital storytelling in the professional development of teachers. If this practice were included in teacher training curricula, all teachers, regardless of their current level of expertise, would be adequately prepared to apply digital storytelling effectively in the classroom.

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