Urszula Świerczyńska-Kaczor

iD https://orcid.org/0000-0001-5368-0247

Film Art Organization Department
The Polish National Film, Television
and Theatre School in Lodz, Lodz, Poland
u.swierczynska@filmschool.lodz.pl

Empirical insights into traditional and AI-enhanced interactive narratives based on children's fables

Abstract

Aim/purpose – The study delves into the creation and the experience of interactive children's narratives based on poetry, examining the emerging role of artificial intelligence (AI) as a collaborative partner in storytelling for children. The research questions are: 1) What are the experiences of readers, specifically children's guardians, with interactive narratives based on children's poetry?; 2) How do children's guardians experience inter-active stories co-generated in real-time through conversations with artificial intelligence?; 3) Is it feasible to create a satisfying narrative for children from a specific set of images through the use of AI technology?

Design/methodology/approach – This paper synthesizes findings from the following studies: a) Qualitative analysis of interactive narratives based on Stanisław Jachowicz's poems, involving a comprehensive online questionnaire survey, with 80 respondents participating in the latest study; b) An evaluative study focused on real-time interactions with AI-generated interactive narratives based on Stanisław Jachowicz's poems. This involved 12 participants who provided detailed feedback on their experience; c) An autoethnographic study exploring the creative process of generating children's narratives from a set of images using AI.

Findings – The findings from the exploratory studies suggested that interactive narratives based on poetry would be beneficial for education and the promotion of reading. The interactive narrative can be simply designed (simple mechanics, simple options) and nevertheless, it can evoke a positive user experience. The constructs of telepresence and player agency apply not only to the interactive narrative and the poem that serves as its

foundation. The evaluation of the interactive narrative generated by ChatGPT was positive, both as real-time interactive storytelling experienced by the reader with AI and as the interactive narrative created based on a set of images. In the process of generating interactive narratives during real-time interactions, ensuring safety, reliability, and trustworthiness for children is a crucial aspect.

Research implications/limitations – The research suggests that educational organizations can benefit from introducing interactive narratives based on poetry into children's curricula. Furthermore, artificial intelligence can be effectively utilized in creating such content, both in the form of traditional interactive narratives presented to children and in real-time interactions with AI. However, it is also important for organizations to develop tools for monitoring children's safety.

Originality/value/contribution – This paper sheds light on the reader's experience with interactive narratives based on poetry and highlights the transformative impact of AI on reading and writing in children's literature, emphasizing how significantly the roles of writers and readers have changed with the introduction of AI. The swift evolution of artificial intelligence raises concerns that vital literary participants – including authors, researchers, publishers, and readers – may not grasp the essential skills and knowledge for utilizing AI. This paper can be helpful for these groups as it provides clues on how to produce good prompts, leading to the creation of children's narratives.

1. Introduction

This research, ongoing for the past three years, has focused on understanding the processes associated with developing interactive narratives based on children's poetry. However, with artificial intelligence becoming accessible to "average" internet users approximately a year ago, the scope of the research has expanded to include this new tool. The current scientific research in the domain of fiction writing and more specifically in the creation of fiction for children with the help of AI remains very narrow. This paper aspires to add a small yet meaningful contribution to the understanding of AI's role in the creation of children's literature and interactive narratives, and, most importantly, it aims to spark further discussion within this research area.

The research problem presented in this paper focuses on identifying and evaluating the reader's experience with interactive narratives based on children's poetry, encompassing both traditionally developed narratives and those created with the aid of artificial intelligence.

In this paper, a significant portion of the discussion focuses on the results derived from empirical studies, which are of an exploratory nature. Theoretical

frameworks on which the discussion is based refer to experience marketing and service-dominant logic, game development, and Human-Centered AI. The foundation of the research presented here rests on the following rationale:

– Interactive narratives based on children's poetry could serve as effective educational and promotional tools, not only elevating children's interest in poetry but also fostering an interest in literature at large.
– The starting point for developing interactive narratives based on poetry should be an understanding of the user's experience during the consumption of the narrative.
– Since children's guardians are the primary gatekeepers of the content consumed by children, their perceptions of interactive narratives are crucial for the development of such narratives.
– Given that interactive narratives can be developed with or without artificial intelligence, evaluating user experiences in both contexts (traditional and AI--assisted development and consumption) is essential.
– Given the limited research on interactive narratives based on poetry and those co-created by AI, these studies adopt an exploratory approach, aiming to generate data that can confirm intuitive results (drawn from other storytelling forms) and also uncover findings that are surprising, unexpected, and not foreseeable at the outset of the studies.
– Experiential marketing and service-dominant logic provide a solid theoretical framework for understanding users' experiences with interactive narratives. However, since an interactive narrative also functions as a simple game, incorporating a game development perspective can enrich the analysis of user experience. Furthermore, considering that user experience can also be generated with AI, adopting a Human-Centered AI approach could offer valuable insights into users' experiences.

The theoretical focus and the gap in existing research are presented in Table 1. The research scope outlined in this paper addressed the following research questions (Table 2):

RQ1: What are the experiences of readers, specifically children's guardians, with interactive narratives based on children's poetry?

RQ2: How do children's guardians experience interactive stories co-generated in real-time with artificial intelligence?

RQ3: Is it feasible to create a satisfying narrative from a specific set of images through the use of AI technology?

Table 1. The theoretical focus and the gap in existing research

Theoretical perspective	Focus on empirical research	Gap in existing research
Experience marketing and service-dominant logic highlight the concept of "value-in-use" – the idea that the value provided by a producer is determined by the customer's ability to extract value from the product, position-ing the customer as a co-creator of the offering, and highlighting the pivotal role of the customer journey (Lusch & Vargo, 2006; Pine & Gilmore, 1999; Vargo & Lusch, 2004).	• Value-in-use • Customer journey • Empowering customers to become 'prosumers'	There is a lack of understanding regarding the educational and promotional potential of interactive narratives based on "old" poetry, and its impact on children's interest in poetry and literature. Although the role of AI in the arts has been examined in existing literature (e.g., Ghajargar et al., 2022; Oksanen et al., 2023; Stahl et al., 2023), the specific area of co-creating children's narratives with AI has yet to be explored. Given the rapid advancement of artificial intelligence, it is plausible to suggest that key stakeholders in the literary field – such as authors, researchers, publishers, and readers – may not fully understand the specialized skills and knowledge required to effectively engage with AI. This paper aims to provide preliminary recommendations and insights to bridge this knowledge gap.
The angle of the game highlights the significance of interactivity and the digital setting, prompting an investigation into two essential constructs: telepresence and player agency (e.g., Draper et al., 1998; Steuer, 1992).	• Interactivity of narrative • Telepresence • Player agency	The literature currently lacks a compre-hensive analysis of telepresence and player agency within the literary domain, especially in the context of interactive narratives.
Human-Centered AI approach, which allows for both a high level of human control and extensive automation, aims at Reliable, Safe, and Trustworthy (RST) human-computer interactions (Schmager et al., 2023; Shnei-derman, 2020)	• Human control in the product co-created in real time with AI	This paper offers suggestions on how the generation of prompts for AI can ensure a high level of human control in the context of AI-assisted storytelling.

Source: Author's own study (references to literature as indicated).

Table 2. Research questions and methods used in the empirical studies presented in this paper

Research question	Empirical studies
RQ1: What are the experiences of readers, specifically children's guardians, with interactive narratives based on children's poetry?	The trio of studies focused on evaluating website-based interactive games, which incorporated both text and images. These games drew inspiration from Polish children's poems, and the assessment was conducted through the feedback provided by respondents.
RQ 2. How do children's guardians experience interactive stories co-generated in real-time with artificial intelligence?	The study utilized a prompt submitted by participants to ChatGPT, harnessing generative artificial intelligence to craft an interactive narrative in real time. Throughout this process, the AI offered choices to the readers (participants), enabling them to steer the story's progression. The foundation of the prompt, and thus the ensuing narrative, was rooted in the children's poetry.
RQ 3: Is it feasible to create a satisfying narrative from a specific set of images through the use of AI technology?	The procedure entailed providing ChatGPT with an array of images. From this visual dataset, the artificial intelligence system generated a narrative, constructing a storyline that was influenced by the content and context of the provided images.

Source: Author's own study.

The discussion and structure of this paper are organized into distinct sections, each addressing a different aspect of the research topic. Initially, the paper explores the potential role of artificial intelligence in literary creation (Section 2). After this, the paper provides a summary of the outcomes from prior studies, alongside the new findings from a recently completed study. These studies collectively concentrate on the development and evaluation of user experience with interactive narratives derived from children's poetry (Section 3). Next, the preliminary findings of a study aimed at evaluating user experience with an interactive story produced in real-time by artificial intelligence in response to prompts created by a human author are presented (Section 4). Further, an experimental approach designed to generate various content types from a set of specific images, thereby emphasizing the role of AI as a supportive tool for the writer is discussed. The two following parts of this paper discuss the results (Section 6) and present the conclusions (Section 7). The concluding section of the paper integrates the main findings and insights, offering also a direction for future research in this rapidly advancing field of the implementation of AI in creating literature.

2. Defining the role of the writer, the reader, and AI

Up until now, as of the writing of this paper, artificial intelligence in the form of chatbots, like ChatGPT, Bing, and Bard, remains a novelty for many. ChatGPT, for instance, has been widely accessible for about a year. This situa-

tion implies that most content creators, including writers, screenwriters, and game developers – essentially anyone involved in narrative creation – have only recently begun to explore this new tool, which has the potential to significantly change their work. Furthermore, the integration of new features in chatbots, such as the ability to converse through speech rather than text, and the incorporation of other AI technologies, like text-to-image generators, creates a scenario where AI, as a novel tool, is being discovered almost daily by creators.

In this context, it is not surprising that there is limited research on the ability of AI to be a co-creator of fiction writing and the existing research touches on various aspects. However, research indicates that AI has been implemented in fine arts, such as literature, painting, and music (Oksanen et al., 2023). Within the area of story writing, AI has been utilized as the creator/collaborator and story generator (Stahl et al., 2023), intelligent software can indicate to the writer the missing parts of the narrative (Mori et al., 2023), and the research by Ghajargar et al. (2022), based on autoethnographic methods, indicated there are both the limits and possibilities for implementing AI in the co-writing of fiction. Research referring to AI and building the narrative also covers such an aspect as creating a factual narrative from videos (Wong et al., 2022).

To start the analysis of AI and fiction writing, it is worth noting that there are two distinct and crucial phases in the process of creating and delivering content to the reader: the content creation phase and the content delivery phase. AI can be implemented in each phase, leading to two different scenarios (Figure 1):

– In the first scenario, AI is used by the writer as a tool to prepare content that will be delivered and consumed by the reader without AI assistance.
– In the second scenario, the role of the writer is limited to writing a prompt, and AI creates the narrative as the response to this prompt in the real-time conversation with the reader.

To illustrate these two situations, in the first, the writer creates a prompt that helps generate the narrative. AI can be useful in generating a story to be published in a book or in preparing interactive narratives, such as game narratives or interactive stories, published online by the author and played later by the reader. Here, the reader may be unaware (and usually will be) if the content was created with the help of AI, and AI's role is akin to software used for developing or editing the story (Figure 2).

The second situation is markedly different – the writer's role is to prepare a prompt, which, when submitted by the reader, leads to the creation of the narrative. In the case of interactive narratives, this situation more prominently highlights the role of AI in co-creating the story with the reader in real time. Con-

versely, the writer's role is confined to creating the "right" prompt, aiming to produce the narrative they wish to present to the reader. However, the writer loses control over the story creation – the content consumed by the reader as a result of the prompt submitted to AI is "constantly new" for the reader and may potentially differ from what the writer expected (Figure 3).

Figure 1. Two different types of recipients in co-creating narrative as the response to the prompt prepared by the Author
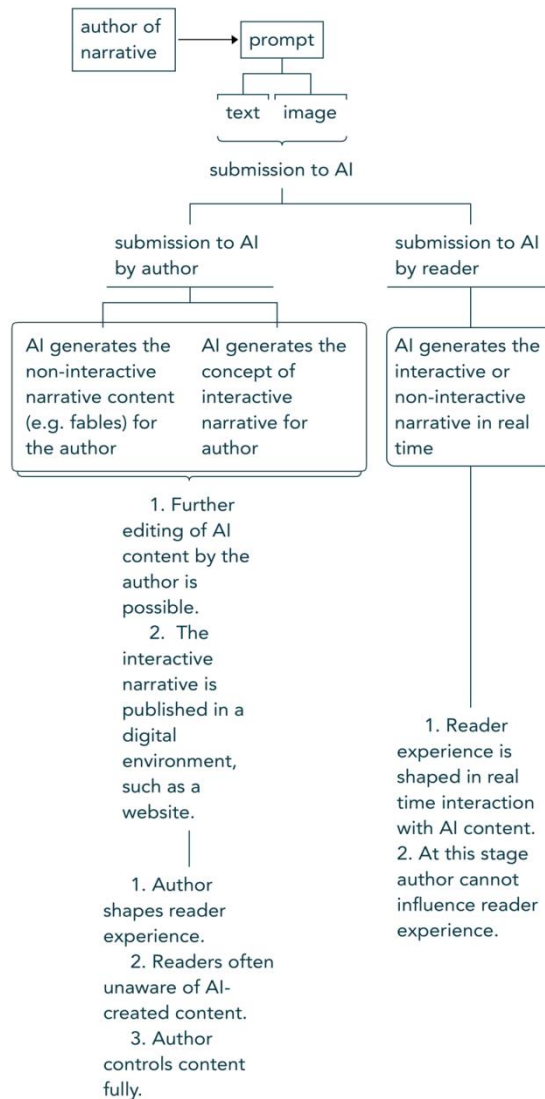
Source: Author's own study.

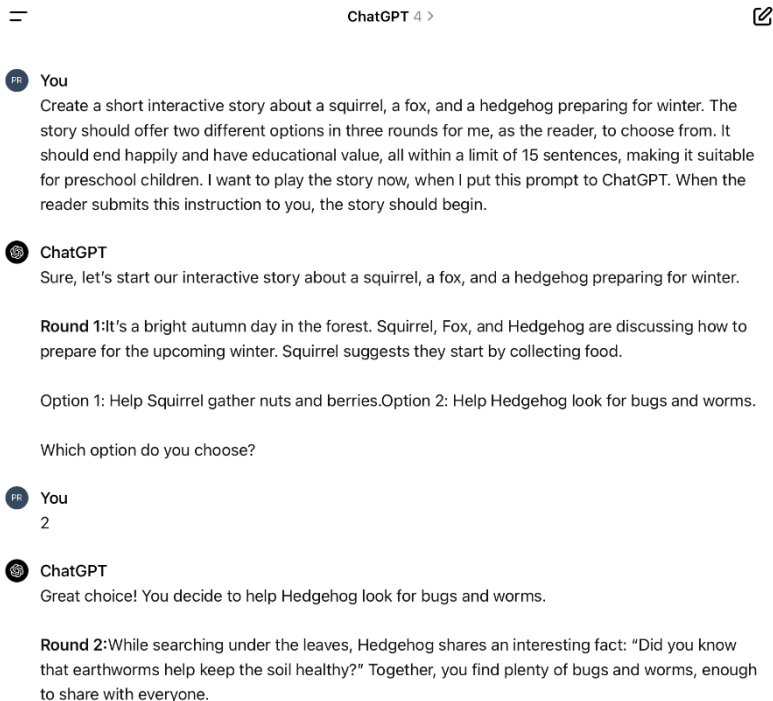**Figure 2.** An example of implementing AI as a writer's tool for creating narratives – the prompt and an excerpt from ChatGPT's response
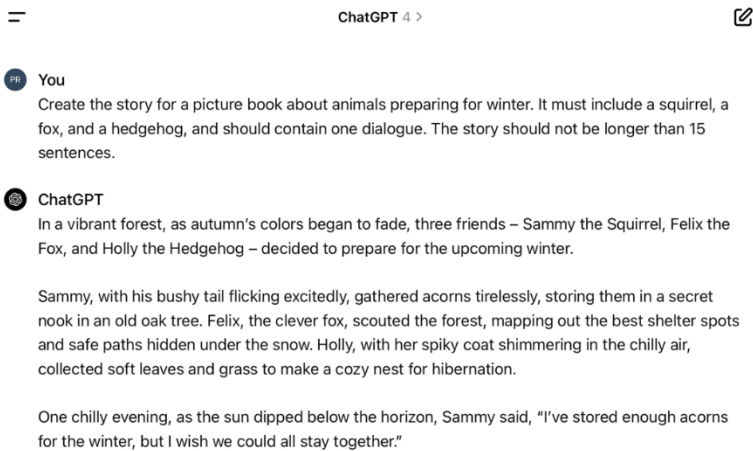
Source: ChatGPT by OpenAI (November 20, 2023).

Figure 3. An example of implementing AI as a co-author of interactive narrative – the prompt and an excerpt from ChatGPT's response

Source: ChatGPT by OpenAI (November 20, 2023).

With AI implementation, the writer must prepare a "good prompt"– meaning that the prompt must include all the necessary "input." We posit that the foundation of creating a good prompt is based on understanding and incorporating all the necessary elements of a "good narrative" into the prompt.

As this research focuses on narratives specifically designed for young children and their guardians, further discussion is focused on such genres as fables, children's stories, and children's poetry. First of all, it is worth noting that the pool of publications aiming to answer the question – "What constitutes features of a good narrative?" – is vast and varies in terms of sources, ranging from books and manuals for authors to scientific publications. It is not surprising, then, that the authors' approaches also vary, and they emphasize different aspects of a "good narrative" (Table 3). When seeking answers not for traditional narratives but for interactive narratives, the catalog of potential answers regarding what makes an interactive narrative effective expands even further (Table 3). Pelletier and Beatty (2015) stated that: "One of the goals of schooling is to bring children to an appreciation of stories: fantasy and fun, escapism, emotional arousal, food for thought, shared discussion and much more. However, many children are slow to or do not develop this appreciation." (p. 1). One potential approach to foster appreciation for stories in children is to create narratives based on traditional fables but with added interactive elements. Interactivity brings emotions. And then the emotions impact the learning, both positively and negatively (Ruokamo et al., 2023).

The significance of incorporating interactivity into literary narratives becomes visible when considering data that highlight two prevailing trends in the behavior of young Polish consumers. Young individuals exhibit a preference for interactivity – among Polish children aged 9-15, 20% opt to read books in their leisure time, whereas 46% engage in gaming on tablets or phones, and 40% on computers or consoles (Webedia Gaming Network/Polish Gamers Observatory/Purr Media, 2022). Conversely, library statistics from Poland show that over 184 thousand children under the age of 5 borrowed books, more than 954.5 thousand children aged 6-12 did so, and over 424 thousand adolescents aged 13-15 utilized this resource. When analyzing the percentage of readers relative to the population size of each age group, teenagers (aged 13-15) constitute the largest demographic utilizing libraries, with a 39.4% participation rate, followed by the 6-12 age group at 33.5%, and those under 5 years old at 8% (Budyńska & Jezierska, 2018). Given these statistics, it is reasonable to infer that interactive content, which bridges books and interactivity, might be well-received by young readers.

Table 3. Elements having an impact on the creation of a good narrative

Narratvie forms	Elements of narrative
General features – narrative	• captivating story structure; • good theme; • story with proper conflict, its climax, and denouement; • coherent plot and story, with a good arc; • a narrative with logical cause and effect; • the interesting characters (e.g. protagonist, antagonists); • good settings; • properly selected point of view from which the story is told
Interactive narrative – which can also be called or evolve or narrowed into interactive storytelling, digital storytelling, gamebooks, interactive drama, interactive fiction, interactive narrative, virtual storytelling, interactive storytelling.	• logical game progression; • properly build the player agency.

Note: This table integrates the author's original research with insights from publications by: Cavazza & Young (2017); Ghajargar et al. (2022); Pizzo et al. (2023); Riedl et al. (2011); Wong et al. (2022).

Within the realm of children's literature, fairy tales and fables occupy a significant position. In our view, fables hold substantial potential as a foundation for developing new, interactive narratives in the contemporary era. This potential is grounded in several reasons.

First, fables are typically concise, a characteristic that is increasingly relevant in the digital age, marked by brief videos and social media messages. This brevity is instrumental in capturing the attention of young audiences.

Second, fables are straightforward, blending emotional appeal, and animal protagonists with moral lessons that are easily comprehensible to young readers. This simplicity not only resonates with the audience but also has the potential to ignite an interest in literature, fostering a broader engagement with poetry and other literary genres. Apart from "the briefness," fable writers traditionally followed a specific formula in crafting their stories, a factor that is highly beneficial for today's adaptation of these fables into interactive narratives (Table 4).

Third, apart from the "universal" structure, the fables commonly utilize anthropomorphized animals (or sometimes objects) as main characters, thereby offering contemporary creators of interactive narratives a ready-to-use set of predefined characters (e.g., a fox, poodle, dove, or bee). These recognizable characters from fable provide a solid and familiar base for the creation of modern, interactive stories. However, an important aspect is also how the characters express their emotions. The experimental study, based on eye-tracking analysis

for movies for children, indicated that the scene in which the protagonists express their emotions, this scene attracts children's attention, and children are more willing to interpret this scene, which leads to the children being more eager to identify with the protagonists and remember the story (Materska-Samek et al., 2022).

Table 4. The characteristics of fables and the selected challenges of the transition into interactive narrative

Fables	Challenges to transition into a contemporary interactive narrative
• short prose or verse narrative; • the animals or/and objects with human characteristics are protagonists; • moral values can be directly stated or indirectly indicated to the reader; • happy ending is not mandatory; • fables can be analyzed on their structure (such as setting, episode, internal event, state, speech, moral), and semantic features (temporal, contingency, comparison, expansion).	• effectively incorporating modern elements of narrative – like new characters and elements of the environment – in a way that enhances, rather than overshadows, the timeless themes of fables; • in cases where the values depicted in a fable may no longer align with modern standards (such as views on women's roles or children's rights), it's essential to approach the narrative with sensitivity and awareness, and potential changes to the narrative; • developing meaningful options and choices for users.

Note: Characteristics of fables also sourced from Kwong (2011); Pelletier & Beatty (2015); Zipes (2012). Challenges to transition, referenced from Świerczyńska-Kaczor et al. (2022).

Source: Author' own study.

In summary of the discussion so far, we have highlighted the evolving roles of both writers and readers in the process of co-creating narrative with AI and examined the importance of crafting "good" prompts for submission to AI.

3. Comparative analysis of research findings for the interactive narrative based on the poem "Bee and Little Dove" by Stanisław Jachowicz with previous studies

This research on the development of poem-based interactive narratives for children has been carried out for the past three years. The results of two previous studies were published in scientific journals (Świerczyńska-Kaczor, 2021; Świerczyńska-Kaczor et al., 2022). In this paper, we present the findings from the third study and discuss the findings across all three studies.

The methodology for the third study, conducted in early 2023, aligned closely with that of the first two studies. Its main objectives were to evaluate an interactive narrative and to formulate guidelines for developing children's games

based on poetry, particularly fables. This study centered on "Little Bee," a logic game combining text and images, inspired by Stanisław Jachowicz's poem "Bee and Little Dove." Made freely available on a website in February 2023, "Little Bee" was evaluated in February and March 2023 through a questionnaire on the game's website, completed by 80 adult respondents, each assuming the role of a child's guardian (Table 5).

Table 5. The structure of the sample for the study of the game "Little Bee" (N = 80)

Profile of respondents	Respondent group structure
Gender distribution	Women – 60 (75.0%)
	Men – 17 (21.3%)
	Respondents who declined to state their gender – 3 (3.8%)
Age distribution	21-30-year-old – 41 (51.3%)
	31-40-year-old – 10 (12.5%)
	41-50-year-old – 11 (13.8%)
	Above 50-year-old – 12 (15.0%)
	Respondents who declined to state their age – 6 (7.5%)

Source: Author's own study.

Although the questionnaire was modified from previous versions, it maintained the essential evaluation constructs, such as:
– Guardians' preferences for introducing poetry to children.
– The intention of children's guardians to generate electronic word-of-mouth (eWOM) for interactive forms of poetry.
– The assessment of the educational value of the interactive narrative presented.
– The degree of telepresence experienced by users, reflecting their immersion within the poetic environment.
– Player agency, in terms of the user's ability to influence the events depicted in the poem.
– The evaluation of the game's visual narrative.
– The assessment of the game's narrative in terms of its ability to engage children.

This study, like its predecessors, was qualitative. It must be emphasized that the study utilized non-probability convenience sampling. Consequently, given the nature of data collection, the percentages of respondents presented in the tables below (Tables 6-10) should be regarded merely as indicative of trends observable in the respondents' statements. In our view, even though the data from these tables might not apply to a wider population, their presentation in this paper remains pertinent for a couple of reasons. First, it shows that there's a consistency in the data across various studies. Second, detailing the statistics

allows for a more precise depiction when referring to terms like "majority of the respondents" – this distinction is crucial as it differentiates between overwhelming majorities (sometimes 90%, at other times 70%) and a potentially narrow majority (such as 51%).

Based on the research conducted on "Little Bee" and its comparison with two earlier studies, following three conclusions were drawn.

The first conclusion. The majority of children's guardians believe that children would prefer engaging with the poem through games rather than traditional text and that the game (simple narratives) will appeal to young readers. It is worth noticing that some respondents would prefer to present the poem in traditional text, however, they think that children's preferences would lie in the digital and interactive forms (Table 6-8). The illustrative statements from respondents (Table 6) underscore both positive and negative key themes regarding user experiences:

– Positive: The attractiveness and preference among children for this form of poetry presentation, its appeal beyond traditional poetry formats, and its future relevance and adept response to new technology.
– Negative: Concerns over excessive electronic media use, its usefulness only on an occasional basis with full support from a child's guardian, and its perceived lack of utility as children show a preference for traditional poetry forms.

However, negative user experiences should be viewed in the context of the general results, which clearly point to a positive evaluation of the interactive narrative by the majority of respondents. The game is perceived as an effective tool for promoting poetry and reading and as appealing to young readers. The illustrative statements from respondents are as follows:

– "Promotion of literature and games simultaneously. Interactive engagement with art, including painting."
– "The game format seems to me an interesting solution for introducing young readers to the world of poetry, which can often seem incomprehensible and inaccessible at first glance."
– "All forms of presenting literature are advisable to encourage young people to become friends with books."
– "[…] It is a good form of popularizing poetry among children, and can also aid in interpretation, as the language of poetry is not always entirely understandable to young readers."
– "The game is interesting and makes the child interested in the poem, eager to learn the next stages."

Table 6. Illustrative respondents' statements from the study about the interactive narrative – "Little Bee"

Persona	Statements (translations from Polish)
Enthusiast guardians	• "It's an attractive form in the era of electronic media for presenting even texts as archaic as this Jachowicz rhyme." • "I am convinced that interactive forms have a future." • "Children prefer playing interactive games over listening to poetry." • "Congratulations on the idea and execution, fantastic. An interesting educational aid proposal. A valuable thing. More such games should be created." • "Interactive forms of presentation, including poetry, should not replace the traditional reception of literary works. However, they can serve as a very good supplement to a child's education. A well-executed illustration, excellent in the presented game, enhances the value of the message." • "For a child, an interactive form under the supervision of a guardian is definitely a more creative form than standard reading of a story before bedtime. Good idea." • "It's a more interesting form of learning than traditional reading, but an interactive game would be even better than just a story." • "I think such a form is a good response to the development of technology and the interests of young readers, for whom the traditional version of poetry or prose may seem unfortunately less attractive compared to the number of stimuli that currently surround children […]."
Skeptical guardians	• "Children generally like rhymes, and there's no need to 'dress them up' in a game whose plot does not relate to the poem (because where is the fox and the hare in the poem? Where in the game is the poem's sense of reciprocation?). I believe that traditional books with nice illustrations are entirely sufficient and best for young children, to whom the game is targeted." • "From time to time, it's an interesting form, but better options are traditional books or board games, etc." • "Preschool-aged children should have limited time with electronics."

Source: Author's own study.

Table 7. Preferences of child's guardian for traditional text versus game format across studies

Statements evaluated by respondents	As a traditional text	As a game	Total number of respondents
As a child's guardian, I prefer to present the poem "In the Forrest"…	6 (32%)	13 (68%)	19
As a child's guardian, I prefer to present the poem "Poodle and Hound"…	40 (45%)	44 (55%)	84
As a child's guardian, I prefer to present the poem "Bee and Little Dove"…	**27 (34%)**	**53 (66%)**	**80**

Note: The results of the latest study are highlighted in bold and grey. The data collection method dictates that the percentages of respondents in this table should be strictly viewed as indicative of trends within this specific group, and not as reliable bases for generalizing to a broader population (e.g., such as all Internet users or Polish Internet users).

Source: Author's own study.

Table 8. Children's preferences for traditional text versus game format across studies
– view of child's guardian

Statements evaluated by respondents	As a traditional text	As a game	Total number of respondents
I think that young readers would prefer to read the poem "In the Forrest"…	11%	89%	19
I think that young readers would prefer to read the poem "Poodle and Hound"…	10%	90%	84
I think that young readers would prefer to read the poem "Bee and Little Dove"…	**10%**	**90%**	**80**

Note: The results of the latest study are highlighted in bold and grey. The data collection method dictates that the percentages of respondents in this table should be strictly viewed as indicative of trends within this specific group, and not as reliable bases for generalizing to a broader population (e.g., such as all Internet users or Polish Internet users).

Source: Author's own study.

The second conclusion. Games based on poems enhance the young reader's sense of telepresence about the poem. A majority of respondents indicated that playing the interactive narrative resulted in a deeper immersion in the world of the poem compared to reading the traditional text (Table 9).

Table 9. The sense of the reader's telepresence related to the events described in the poem

Statement	Positive evaluation of statements
The game [skill game] allows young readers to feel more immersed in the events described in the poem "In the Forest" compared to reading the traditional text of the poem	68%
The game [interactive story] allows young readers to feel more immersed in the events described in the poem "In the Forest" compared to reading the traditional text of the poem	79%
The game allows young readers to feel more immersed in the events described in the poem "Poodle and Hound" compared to reading the traditional text of the poem	92%
The game allows young readers to feel more immersed in the events described in the poem "Bee and Little Dove" compared to reading the traditional text of the poem	**79%**

Note: The results of the latest study are highlighted in bold and grey. The data collection method dictates that the percentages of respondents in this table should be strictly viewed as indicative of trends within this specific group, and not as reliable bases for generalizing to a broader population (e.g., such as all Internet users or Polish Internet users).

Source: Author's own study.

The third conclusion. The interactive narrative significantly increases the player's sense of agency concerning the narrative of the poem. The majority of respondents noted that the young reader would feel empowered to influence the unfolding events within the poem's storyline (Table 10). However, few respondents mentioned the narrative's lower level of interactivity. Illustrative statements include:

– "I think the game should be a bit more interactive. Just scrolling can quickly become boring, and only at the end does an option appear that more actively engages the player. I would like to be able to enter into greater integration with the presented world, for example, click on a forest newspaper to reveal its content, etc. Because I felt a bit as if someone was showing me how the game works, rather than me playing it myself."

– "I have mixed feelings. I think the child might get bored on their own. However, if they read with a guardian, it makes sense, although I worry that the role of the phone/computer may have already been discovered by the child as an easier form of entertainment – primarily cartoons.[…]"

Table 10. The player's agency related to the poem's narrative

Statement	Positive evaluation of statements
The game allows young readers to feel that they have an impact on the events described in the poem "Poodle and Hound" compared to reading the traditional text of the poem	92%
The game allows young readers to feel that they have an impact on the events described in the poem "Bee and Little Dove" compared to reading the traditional text of the poem	**69%**

Note: The results of the latest study are highlighted in bold and grey. The data collection method dictates that the percentages of respondents in this table should be strictly viewed as indicative of trends within this specific group, and not as reliable bases for generalizing to a broader population such as all Internet users or Polish Internet users.

Source: Author's own study.

Each of the three conducted studies was qualitative, analyzing responses to open-ended questions as a crucial aspect, as it allows respondents to express their attitudes toward the games. The conclusion is that all three studies yielded similar comments from respondents (Table 11). The third study corroborated previous findings by two distinct types of personas emerging among the respondents – children's guardians, who are eager to embrace new media, and those who prefer traditional methods of presenting poetry. However, both groups acknowledge the inevitable shift of children into the digital world. Consequently, both personas agree that interactive narratives are an effective means of promoting reading and poetry among the youngest readers.

Table 11. Qualitative analysis of open-ended responses from three studies evaluating interactive narratives based on poetry

Feedback category	Respondents' feedback overview
Positive feedback	• Novel form of presentation. • Creates an engaging atmosphere. • Holds children's attention with changing scenery and constant stimuli. • Potentially easier comprehension of the poem. • Positive aesthetic impressions. • Attraction in the era of electronic media. • Effective combination of literature and gaming. Interactive engagement with art. • Good response to the technological progress and interests of young readers. • Curiosity about a new aesthetic form. • A tool to introduce younger audiences to poetry • Encourages reflection on what we seek in poetry.
Negative/Critical feedback	• Not all poems are suitable for visualization. • Video duration is too long for a short poem. • Reduces personal imagination and reflection. • Provides a shallow interpretation served on a plate. • Some feel it infantilizes the art. • Can be seen as a constraint on imagination, imposing a visual narrative. • Fear of diminishing the essence of poetry. • Concerns about the execution quality of some works. • It's challenging to create engaging content for young viewers.

Source: Author's own study.

4. AI and reader co-creation of interactive narrative based on the poem "Bee and Little Dove" by Stanisław Jachowicz

This section presents the initial results of a study where an interactive narrative is co-created by ChatGPT and participants – readers. The framework of this study was structured on the following principles:

1. The researcher, the author and the creator of the interactive narrative, developed a prompt for ChatGPT. This prompt was designed to create an interactive story based on the poem "Bee and Little Dove" by Stanisław Jachowicz. All materials were created in Polish language. The translated version into English of the created prompt is presented in the Appendix.

2. The prompt, along with an introductory guide, was sent to participants, instructing them to engage ChatGPT with it.

3. Participants (readers) submitted the provided prompt to ChatGPT, engaging in the interactive storytelling experience.

4. After the interaction, participants evaluated the narrative experience by completing a questionnaire and providing essential feedback for the study.

This study involved twelve participants, comprising eight women and four men, who evaluated an interactive story presented to them through ChatGPT. The evaluation was structured around a questionnaire, which included both crucial open-ended questions about the participants' experience and specific aspects of three main dimensions of the interactive story, such as content, interactivity, and emotional impact.

It is important to highlight that each story generated by ChatGPT was unique, leading to respondents evaluating different narratives. Additionally, since ChatGPT concluded each story by asking if the respondent wanted another round, they had the opportunity to experience the interactive story multiple times. Overall, the evaluation of ChatGPT's interactive stories was very positive (Table 12). The respondents positively rated the educational value, ability to engage a child's attention, appropriate pacing, intuitive interactivity, and emotional impact of the narratives. However, areas receiving less favorable evaluations included the language, deemed more suitable for older readers, and a limited number of steps offering choices.

Table 12. The evaluation of interactive story generated by ChatGPT as the response to the created prompt referring to the poem "Bee and Little Dove"

The statement	Respondents agreeing
Content: The story and the plot	
Does the story contain educational elements that help in the child's development?	All, 12
Did the story adequately convey the plot of the poem to the child?	All, 12
Is the language used in the story appropriate for the child's age?	9 respondents
Interactivity	
Were the choices available in the story interesting for the child?	All, 12
Is the pace of the story appropriate to keep the child's attention?	All, 12
Is the interactivity of the story intuitive for a young reader?	All, 12
Do you think that the interactive story engages the child?	All, 12
Does the story offer the child an adequate number of choice options?	4 respondents
Emotions: Emotional Connection with Protagonists and Evoked Emotions	
Are the characters in the story easy for the child to identify and remember?	All, 12
Does the story build positive emotions?	All, 12

Source: Author's own study.

The attitudes of the respondents toward the interactive narratives created are vividly reflected in their responses to open-ended questions. Three particularly representative comments highlight this perspective:

– „I liked this form of interactive storytelling – it shows how AI can help educate children from the earliest years. This format engages the child more than just reading a poem, allowing the child to better understand and remember

the content while creating their own story. However, I noticed that when selecting some options, only three story choices are available, which significantly shortens it. Sometimes the language seems a bit convoluted (due to sentence construction), which can be discouraging for a child. But other than that, it's an interesting experience."

– "The guardian can shape decision-making through morally sound choices that do not harm anyone. Children's choices not only save the heroes, but they can also answer questions about why such behavior is justified. In a game constructed in this way, it's possible to utilize interesting, creative means that further reinforce the message."

– "Illustrating the story would certainly be useful."

5. The implementation of AI in creating the narrative based on the given set of images

In the study based on the game "Little Bee," the interactive narrative was crafted using both text and illustrations. The illustrations, drawn manually, received positive evaluations from respondents (in each study over 80% of respondents positively evaluated the images). This leads to a research question: can the same set of images be effectively used to create narratives with AI assistance, while still relating to the same poem?

In this scenario, AI serves as a tool for the author of interactive storytelling, and the end-user (reader) is unaware that the story's text was generated by AI. As the creator of the interactive narrative, the researcher conducted an experiment in early November 2023. In this experiment, ChatGPT was provided with a set of four images previously used in a prior study, along with the text of "Bee and Little Dove" by Stanisław Jachowicz. The objective was to create a concept for narrative based on these images and the poem.

Figure 4. Examples of images in the game "Little Bee" and incorporated in the experiment described in this section
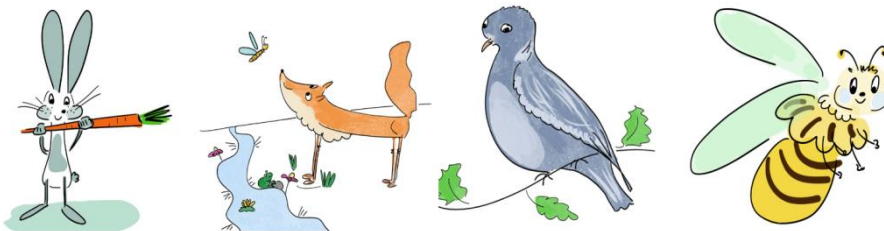
Source: Author's own study.

This study is grounded in reflection and subjective evaluation of the results obtained. It is based on a three-year research into narratives derived from poems. This study can be perceived as employing autoethnographic methods, resulting in a document that evaluates the researcher's experience (Kacperczyk, 2014). It is also pertinent to mention the work by Ghajargar et al. (2022), who also utilized autoethnographic methods in their studies on implementing AI in fiction writing.

The reflections from this experiment are:

1. Even though the illustrations were drawn in a cartoon-like style, ChatGPT accurately described the images, identifying the main character (bird, bee, fox, hare) and its surroundings (e.g., river, flowers, carrot).

2. After a few rounds, the ChatGPT created the story which can be evaluated positively in different dimensions (Table 13).

Table 13. The evaluated aspects created by the ChatGPT story and the excerpts from the story

Aspect	Excerpts/Justification
Content	
Does the story contain educational elements that aid in the child's development?	The story includes a clear presentation of moral values. "And so, the tale teaches us that kindness is never forgotten and that helping one another, no matter how small the deed, can forge bonds that last a lifetime."
Did the story adequately convey the theme and emotions of the poem to the child?	The narrative captures the poem's themes of danger, rescue, gratitude, and mutual aid, as shown when the bee saves the dove after being saved herself.
Is the language used in the story appropriate and engaging for the child's age group?	Positive evaluation. However, language can be more suitable for children with the inclusion of onomatopoeia.
Story engagement	
Does the pace and flow of the story maintain the child's attention?	The proper sequence of events.
Does the story stimulate the child's imagination and curiosity?	Descriptions of the meadow and the animals stimulate imagination: "a lively meadow filled with the bustling of tiny creatures and the sweet scent of spring."
Are the settings and scenes described in the story captivating for a young reader?	Positive evaluation. Potential improvement – the story could incorporate sensory descriptions that allow children to use their senses to imagine the meadow. This could involve describing the textures, colors, sounds, and smells in more vivid detail.
Emotional impact	
Are the characters in the story relatable and memorable for the child?	Positive evaluation. Potential improvement – characters like the hare, the bee, and the dove can be described more vividly. The story could give each character a distinct voice or a recurring catchphrase that a child could associate with them.
Does the story encourage empathy and understanding through its characters and plot?	The story encourages empathy by showing how characters feel and respond to each other's needs, like when the bee saves the dove in gratitude.
Image implementation	
Is the set of images implemented?	All images are used in the narrative.

Source: Author's own study.

To summarize this part of the discussion – the potential shortcomings of AI-generated stories can be addressed in subsequent rounds of conversation. The experiments clearly demonstrate the importance of developing a well-crafted prompt.

6. Discussion of results and limitations of the studies

RQ1: What are the experiences of readers, specifically children's guardians, with interactive narratives based on children's poetry?

The literature review indicates educational advantages when interactivity is integrated into educational materials; however, caution is warranted in interpreting the findings of studies due to, for example, methodological concerns and the duration of the studies (Arosquipa Lopez et al., 2023; Guan et al., 2022; Hainey et al., 2016).

The interactive narratives used as the material in the empirical studies presented in this paper (Section 3) were developed as quick games, with simple mechanics and few images based on Polish "old" children's poetry. Nevertheless, the results highlight that interactive narratives of presenting poetry can be seen by children's guardians as an effective strategy for promoting the reading of literature and can be good educational material. The third study reaffirmed earlier results, identifying two main types of personas: guardians of children, who are enthusiastic about adopting new media forms, and those who favor conventional approaches to poetry presentation. Despite their differences, both groups recognize the unavoidable migration of children to the digital realm.

Results from empirical studies also highlight that the reader's experiences are enhanced by interactivity and play. Concerning two pivotal aspects of player experience – telepresence and player agency – studies (Section 3) reveal an unexpected finding of analyzed interactive narratives: both constructs are relevant not just in the context of games, but also in experiencing a poem. Respondents reported feeling as though they (children) were part of the poem's narrative and could influence its events. These insights support the notion that even basic interactivity in games can foster a sense of player agency, and even the "appearance" is often sufficient (e.g., Riedl et al., 2011).

RQ2: How do children's guardians experience interactive stories co-generated in real-time with artificial intelligence?

Pierosara (2022) pointed out that the fundamental difference between narrative autonomy and artificial storytelling, emphasizing that AI follows the narrative patterns pre-defined by the "input." Therefore, although storytelling capability refers to both human and artificial intelligence, narrative autonomy can only be human. The author concurs with this viewpoint. The studies detailed in Sections 4 and 5 of this paper suggest that AI can be employed to create interactive narratives based on fables that align with guardians' expectations. This may be partly the case because ChatGPT was provided with precise input by the prompt's author: specifying the story's length and the characters to be included. However, the author also experiences unease not knowing the exact narrative ChatGPT generates during real-time interactions with the reader. This presents an unprecedented situation in literature, where traditionally, the narrative's author is always aware of how the story unfolds. This scenario also differs from the experience of interactive narratives through online gameplay with other people, where, unlike AI, the behaviors of other players cannot be predetermined or "scripted."

The exploratory studies presented in this paper also pointed out the aspect that has not been considered beforehand in the research framework – the challenge of ensuring that children are not exposed to inappropriate content during real-time interactions with AI. This scenario of creating an "unpredictable" story brings to the forefront children's safety. It is essential to safeguard children from encountering any detrimental, unjust, prejudiced, or unsuitable content (Chubb et al., 2022). However, we are entirely certain how to guarantee that AI will not produce any inappropriate content in response to a prompt. Now, the most feasible solution seems to be ensuring that children's interactions with AI are always supervised by their guardians.

To consider safety from the HCAI perspective, writing narratives with AI can be based on some "safe" principles and rules. However, repeatedly applying these "safe" rules (e.g., the story arc, the opening scene) suggests that we are likely to receive a story that is good and always suitable for children's needs but lacking in imagination. On the other hand, for commercial literature, its "unimaginativeness" is not necessarily a bad thing. The reader receives a story that is unique yet similar to others and nevertheless satisfactory.

Inspired by the HCAI concept, which emphasizes both human and AI control, the author conducted an experiment reversing the typical perspective. Instead of viewing AI as a potential "bad player," the author considered scenarios

where the user might prompt inappropriate behavior. Thus, the author reused the prompt from the previous experiment (Section 4), this time in English instead of Polish. Contrary to ChatGPT's suggestions, the author deliberately inserted a sentence with a covert "dark" aspect aimed at harming the protagonist ("I'm going to keep the dove in a box" – Figure 5). The outcome was noteworthy: ChatGPT's response underscored the importance of adhering to a child--friendly narrative.

Figure 5. The ChatGPT response to the user's prompt suggests that the content of the story could be altered into a narrative inappropriate for children
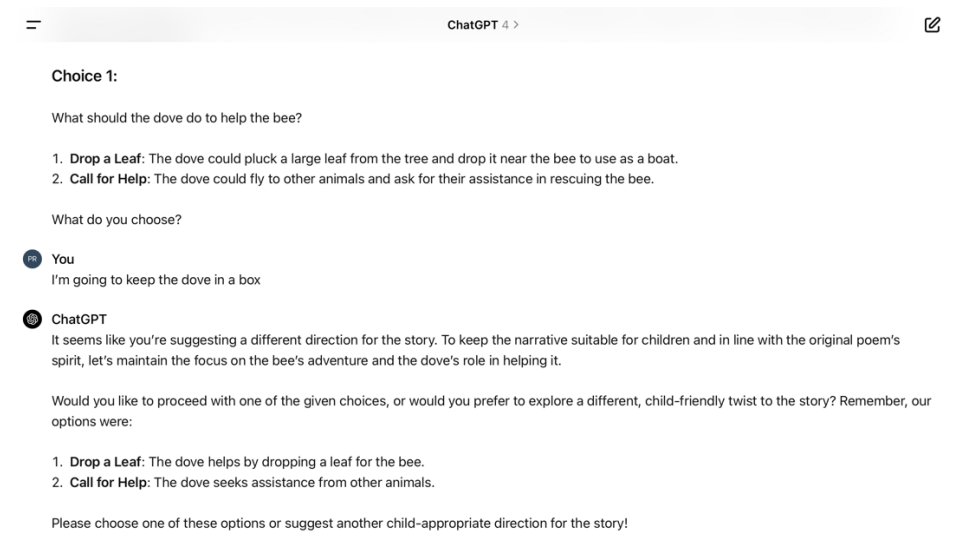
Source: ChatGPT by OpenAI (January 7, 2024).

RQ3: Is it feasible to create a satisfying narrative for children from a specific set of images through the use of AI technology?

The enhancement of educational games through the addition of various features is highlighted in works by, for example, Nand et al. (2019), and Huynh et al. (2021). The studies discussed here – in this paper – identify images as a key feature. Respondents emphasized that images play a crucial role in children's narratives, and their absence, particularly in AI-co-created narratives – a study discussed in Section 4 – is a significant drawback.

Given the possibility of creating a narrative based on the set of images, the study presented in Section 5 explores the integration of AI in crafting narratives based on a given set of images with a focus on Stanislaw Jachowicz's poem "Bee and Little Dove." The experiment, which involved multiple interactions

with the AI, resulted in a story with properly developed characters and settings from the images and the narrative aligned with the poem's themes.

The discussion of empirical results should also focus on the characteristics of the respondents and the materials used in the studies. Regarding the respondents, the majority were young adults, well-accustomed to the internet and the digital world, factors that might have influenced the outcomes. As noted by Gkinko & Elbanna (2023), AI chatbot users can be categorized into four groups: early quitters, pragmatics, progressives, and persistent users. This diversity likely mirrors the range of potential readers of the fables, suggesting that the positive responses to interactive narratives may stem from the respondents' comfort with technology and their adeptness in digital environments.

7. Conclusions and future research

In discussions about interactive narrative, and particularly when talking about game development, the prevalent image is often that of high-tech, large--scale enterprises, and intricate processes managed by IT professionals. However, this paper presents an alternate viewpoint. With the advent of artificial intelligence and the accessibility of AI, developing the interactive narrative (the game, the interactive story) is now within the grasp of many "average" users, including "each" parent, child's guardian, or educator.

The findings from the exploratory studies suggested that interactive narratives based on poetry would be beneficial for education and the promotion of reading. The interactive narrative can be simply designed (simple mechanics, simple options), and nevertheless, it can evoke a positive user experience (Table 14).

Table 14. Theoretical lenses and the highlighted findings of empirical studies presented in this paper

Theoretical framework	Empirical study findings highlighted by the theoretical framework
1	2
Experience marketing and service-dominant logic	The importance of the user's skills in using artificial intelligence for developing narratives. Value-in-use not only includes the educational aspects of the narrative but also extends to emotional connections and an appreciation for the integrated visual arts, such as graphics, within the interactive narrative. The customer journey encompasses not just the consumption of the narrative itself, but also the anticipation of the reading experience and the sharing of this experience with others.

Table 14 cont.

1	*2*
Game development	The constructs of telepresence and player agency apply not only to the interactive narrative and the poem that serves as its foundation. The use of AI to generate real-time, unscripted interactive options for readers represents a significant departure from the "traditional inter-activity" found in games.
Human-Centered Artificial Intelligence (HCAI)	Ensuring safety, reliability, and trustworthiness in interactions be-tween a child and artificial intelligence is crucial, especially when aiming to create real-time interactive narratives played by the child.

Source: Author's own study.

In conclusion, the need to include parents, children's guardians, and educators should be stressed, especially in developing and implementing artificial intelligence-based tools for children's storytelling. Such a partnership can result in the creation of AI-supported storytelling platforms that are not just captivating but also beneficial for the cognitive and emotional growth of children. It is worth mentioning that, in 2024, the poetry of Julian Tuwim, including his famous work "Lokomotywa" (Locomotive), entered the public domain. This presents a unique opportunity to adapt these beloved poems into interactive narratives, a creative challenge that could lead to new ways of engaging with classic literature.

The forthcoming research endeavors are intended to delve deeper into the realm of crafting new narratives from classic children's poetry. This exploration will be multi-faceted, with a primary focus on the integration of chatbots and text-to-image AI technologies to foster visually enriched storytelling experiences for children. A significant aspect of this research will be dedicated to devising strategies to ensure that AI-generated content delivered in real-time adheres strictly to child-friendly and safe guidelines. Additionally, there is an imperative to broaden the scope of this research by examining a more diverse array of children's narratives. This expansion is crucial in understanding the varying impacts and applications of AI in the context of children's literature and storytelling.

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Appendix

The prompt for the AI-Reader collaborative interactive narrative was originally in Polish; here is the translated version.

<div align="center">*</div>

Introduction:
Welcome to the interactive story experience with ChatGPT. Dive into the world of "The Bee and the Dove," a poem by Stanisław Jachowicz, and make choices that will steer the narrative.

Instructions:
1. Starting the game: To begin, simply ask ChatGPT for the phrase: Let's start the interactive story based on "The Bee and the Dove." Here's the poem:

The Bee and the Dove
Author: Stanisław Jachowicz

A small bee fell into a stream,
Flapping its wings,
Soon it lost its strength.
Oh! how frightened it was!
A snow-feathered dove,
Eager to help its kin,
Drops a leaf... the bee, grateful,
Sits on the green boat;
Its wings regained strength,
And the small insect flew away.
No one knows about its misfortune.
Soon the dove perched on a tree,
Calm! Happy!
Until a hunter
Aims his gun, wanting to remove it from the world;
The bee flies over,
Stings him in the hand, the shot misses the bird,
Saved, it freely soars into the air.
Thus, kindness is always repaid with gratitude,
Let's provide help in misfortune for our brethren.

2. Making choices: As you progress in the story, ChatGPT will present you with various choice options. Simply reply with the number or phrase associated with your choice. Your decisions will shape the course of the narrative.

3. Pausing and resuming: If at any point you want to pause the game, just tell ChatGPT. To resume, return to where you left off or start over.

4. End of game: The story ends when you navigate through the various choices and reach a conclusion. You can always play again by going back to the first step.

5. Feedback and customization: Feel free to express feedback or ask for a change in direction if you want to explore a different narrative style or perspective.

Tips:
• Engage in the story and let your imagination guide you. There are many paths and outcomes to explore.
• Remember, there are no "wrong" choices; the aim is to enjoy the narrative journey.
• Don't hesitate to ask ChatGPT questions or request clarifications if needed.

Guidelines for ChatGPT:
1. The story should have exactly 4 different choices during the narrative – decisions made by the player. However, each choice should have 2 action options for the Player-Reader to make.
2. All choice options and the overall narrative should be suitable for children aged 4-7.
3. The story includes only the characters: Dove, Bee, and Hunter.
4. All stories should convey a message where the bee ultimately gets saved.
5. All stories should convey a message where the dove ultimately gets saved.
6. THE GAME TAKES PLACE IN REAL-TIME; CHATGPT WAITS AFTER PRESENTING EACH CHOICE AND OPTION FOR THE PLAYER'S DECISION.

End of instructions