

Generating Interactive Stories with ChatGPT to Teach Filipino Values

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Abstract: Interactive storytelling uses digital media to engage readers to interact with the author's narrative through key decision points in the story. This has been shown to be an effective learning resource in teaching across various disciplines. Designing interactive storytelling systems typically require handcrafted storytelling knowledge and branching story graphs. Generative AI offer an opportunity for facilitating the production of interactive stories. In this research, we utilized ChatGPT to provide the storytelling knowledge for Kulturuan, a system that teaches the Filipino value of *pakikipagkapwatao* or hospitality to grade school students. Prompts are formulated to instruct ChatGPT to generate bits and pieces of the story text. Results from experiments and refinement of carefully formulated prompts showed ChatGPT's potential as a knowledge resource for interactive storytelling systems, thus eliminating the need to expend time and effort in building a separate story graph. However, further downstream tasks are needed to process the resulting story text to fit the interactive environment of Kulturuan.

Keywords: Interactive storytelling, Filipino values, Generative AI, Prompt Formulation

1. Introduction

Stories predominate traditional Filipino literature as a means of imparting cultural values. To preserve and give importance to local traditions and values, the Philippine Republic Act No. 9155 or the *Governance of Basic Education Act of 2001* required the formal inclusion of the arts and culture in the basic education curriculum to instill love and pride in the country's heritage among Filipino learners. While younger generations are aware of the importance of conserving traditional Filipino culture, their awareness does not reflect their preference in which culture they choose to practice (Tabuena et al., 2022).

The introduction of digital media encouraged the notion of utilizing technology in promoting culture and enabling an interactive access to arts. This corresponds to a shift in focus from oral stories to interactive storytelling. *Adventures of Ellie* is a 2D learning environment that uses interactive stories to prepare children with autism spectrum disorder (ASD) for social situations (Ong et al., 2016). *Sarah* is a virtual peer that shares interactive healthcare stories to raise awareness on proper healthcare practices among children (Lee et al., 2019). *Amy* is a virtual talking companion that supports the social-emotional learning of children with ASD through the sharing of interactive narratives (Gagan et al., 2023).

While these studies reported the potential impact of interactive storytelling on learning, most systems are not centered on teaching culture and values. They are also mostly written in English, making such technologies inaccessible to those who are not proficient in the language. Furthermore, these systems utilize manually-built resources and predefined branching story graphs (Riedl & Young, 2006) to provide the necessary knowledge needed in the generation of stories to be imparted to the children.

Recently, large language models trained on huge amount of human-authored text have facilitated the availability of AI systems that can understand and generate human language (Radford et al., 2018). Among these is ChatGPT which produces fluent text on varying genre and disciplines, including stories (Ouyang et al., 2022; Taecharunroj, 2023). Recent studies

have also reported the opportunity in using ChatGPT as a learning resource in education (Tlili et al., 2023) and as a collaborative writing assistant (Duval et al., 2021; Pavlik, 2023).

In this paper, we describe the strategies we employed in formulating prompts to allow our interactive storytelling system, *Kulturuan*, to work with ChatGPT in the generation of culture-based story in the Filipino language. The resulting interactive stories depict the value of *pakikipagkapwa-tao* or hospitality based on themes prescribed in the Department of Education's *Good Morals and Right Conduct curriculum* (DepEd, 2016) for basic education.

2. Related Work

2.1 Interactive Storytelling

Interactive storytelling (IS) allows a reader to interact with an author's narrative, giving the former a key role in the virtual story world and setting that the latter created. The author defines the elements and the plot of the story in the form of branching narratives or story graphs (Riedl, 2004). A branching graph represents the multiple paths and outcomes that can occur in the story (Smed et al., 2021). Usually pre-scripted at design time, these graphs allow readers to make decisions at key points in the story by selecting from a set of candidate events, responding to some events in the story world, giving instructions and advice to other characters (Cavazza et al., 2002), and engaging other characters in a dialogue.

The story elements – setting, characters, objects, and events – collectively form the story world which dynamically changes as the story progresses. A 2D or 3D interactive virtual world interface allows the reader to participate in the story. Participation is usually in the form of a virtual player who can perform actions in the story world, talk to other characters, and manipulate story world objects. The reader can also act as a spectator who navigates the story world, or an adviser who intervenes with the characters' plans (Mateas & Stern, 2003).

An interactive story also follows the common five-act story structure that divides the narrative into five parts: exposition, rising action, climax, falling action, and resolution. These parts cover the introduction of the characters and the setting, the description of the complication or the conflict, the events leading to the turning point of the story, the unraveling of the conflict and resolution of the protagonist's struggles, and the final outcome of the story.

2.2 Generative AI

ChatGPT is a language model (LM) based on the generative pre-trained transformer (GPT) model developed by OpenAI to enable computers to process human language text (Radford et al., 2018). Trained on a huge amount of human-authored text, the model has been shown to perform well in generating fluent text in various topics, genre, and languages. This led to studies that encourage the use of ChatGPT in education, notably as a writing assistant (Duval et al., 2021; Pavlik, 2023; Tlili et al., 2023), amidst concerns on plagiarism, misinformation, and academic misconduct (Cotton et al., 2023; Sullivan et al., 2023; Uzun, 2023).

Prompts are the primary mechanism for human users to communicate with LMs like ChatGPT. Prompts can be in the form of a question, a statement, or an instruction. Recent studies reported the importance of formulating effective prompts to maximize the capabilities of the generative model while avoiding its pitfalls (GPTBot, n.d.; McCoy, n.d.; WeThinkApp, 2023). A set of design principles in formulating prompts recommend the statement of a clear description of the task, explicit constraints, and context (Mayo, 2023). The quality of the LM's responses can also be improved through iterative refinement and follow-up prompts. Like human-human communication, prompts can facilitate chatbot-human communication, allowing ChatGPT to better understand the user's intent expressed through the query and correspondingly generate better quality responses (Mayo, 2023). Prompts can also unlock the LM's creativity and minimize the generation of incorrect responses (GPTBot, n.d.).

3. Interactive Storytelling with Generative AI

Kulturuan aims to impart the Filipino value of *pakikipagkapwa-tao* or hospitality to Grades 1 to 3 children through interactive stories. The stories are set in three possible locations, namely home, school, and outdoors; allowing users to navigate the virtual spaces in each location and to interact with different story characters, such as family members, friends, neighbors, visitors, foreigners, and strangers. These interactions are intended to provide a platform for the children to experience real-life situations where *pakikipagkapwa-tao* can be practiced.

Kulturuan uses ChatGPT as its knowledge resource in the generation of stories. Prompts written in English are sent to the language model through the OpenAI Playground. The model then generates story text in Filipino that narrates the setting, character dialogue, decision points or choices, consequences of user choices, and story ending. To avoid overloading young children with too much textual information, the responses of ChatGPT are parsed to extract only portions of relevant story text that are then displayed in Kulturuan's web interface as illustrated in Figure 1. Because the response of ChatGPT is assumed to be correct, it is imperative that Kulturuan formulates relevant prompts to facilitate the generation of appropriate story text. In this section, we describe the types of prompts that we formulate to enable ChatGPT to generate useful story text for Kulturuan.



Figure 1. Kulturuan's user interface with story text extracted from ChatGPT's response.

3.1 Prompt Formulation

Prompt engineering is the process of creating prompts to interact and elicit useful responses from ChatGPT (Mayo, 2023). To facilitate the generation of different story text, three types of prompts are formulated: *system message prompt*, *story prompt*, and *event prompt*.

A *system message* supports multi-threaded prompts while preventing the need to repeat the same instructions to be sent to ChatGPT via the OpenAI Playground. Table 1 shows the different parts of a system message prompt: (i) description of the task that the model has to perform; (ii) persona that allows the model to act accordingly with the given task description; (iii) output specifications indicating the target audience, story structure, and decision points; (iv) output constraints which include the language and the length; and (v) templates to be followed in generating the decisions points and the character dialogues.

A *story prompt*, shown in Table 2, sets the story world and its elements – the theme, characters, setting, and plot. Important specifications and constraints are reiterated in this prompt, such as the language and use of characters and locations. An *event prompt* indicates the player's choice among the candidate events generated by ChatGPT.

3.2 Response Parsing

The resulting text from ChatGPT has to undergo further processing before it can be presented to the children. A downstream task, *response parsing*, is essential in removing text that is unnecessary to the overall story, i.e., text written in ChatGPT's point-of-view and labels such

as *Exposition* and *Climax*. The parser works by finding elements of the story text from ChatGPT's response and validating that the text includes mentions of characters names and location indicated in the prompt. The parsed story text is then presented to the children through an interface as seen in Figure 1. Presenting short passages of text can help understand and digest the pieces of information, as well as respond to questions posed by the story characters.

Table 1. *Components of a System Message Prompt*

System Message	Parts
You are a <storyteller> who writes stories for <children aged 6 to 9>.	Persona
Only use the <Filipino> language in your responses.	Task
You will follow a <5-part story structure> and each part must have at most <150 words>.	Specification – Target audience
Each part must be <generated one at a time> in a separate response; <do not generate the next part unless a choice has been made>.	Constraint – Language
Here are the five parts: Exposition Rising action. This part contains the 1 st decision point Climax Falling action. This part contains the 2 nd decision point Resolution	Specification – Story structure
Present the decision point in this format: <i>Ano ang gagawin ni Justine?</i> (What should Justine do?)	Constraint – Length
<i>Positive choice: <provide a short description></i> <i>Negative choice: <provide a short description></i>	Constraint – Response structure
Present a character's dialogue in this format: <i>Character: Dialogue</i>	Specification – Decision points
	Template – Decision point
	Template – Character dialogue

Table 2. *Components of a Story Prompt*

Story Prompt	Component
Remember that the story should be written in Filipino, and only use the characters and locations you have been provided with. The main character of the story is a child named <Justine> and the story takes place in the <sub-location> of the <main-location>. The story's theme is practicing good hospitality to others. Let's start with Justine and <NPC>.	Language reminder
	Main character, location
	Story theme



Figure 2. Parsed story text with character dialogue.

Since the prompt to ChatGPT includes the specification of the story structure, finding these elements from the model's response and displaying the corresponding UI sprites should be straightforward. To determine if a story text is to be narrated (Figure 1) or presented as a character dialogue (shown in Figure 2), the response parser checks if the LM's response stated that a character is talking. Figure 3 illustrates how a decision point is presented to the user. By parsing ChatGPT's response this way, children will be able to see how their decisions, whether positive or negative, could influence the outcome of the story.

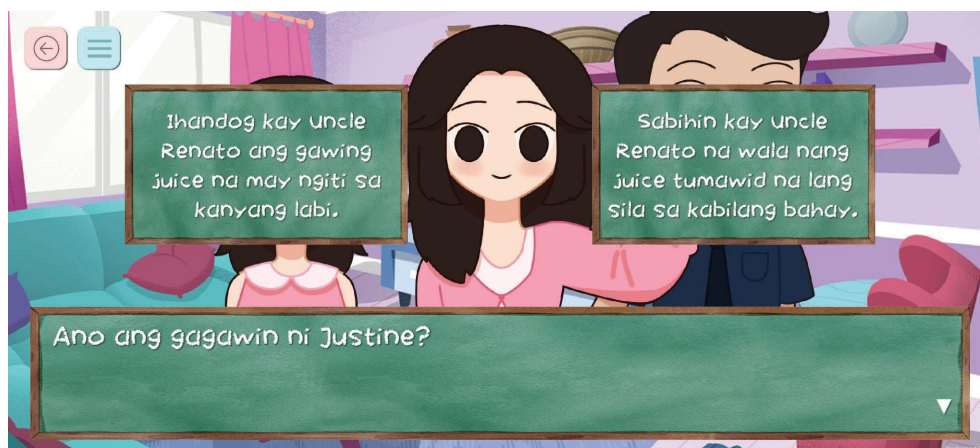


Figure 3. Parsed story text with a decision point.

4. Experiments

We conducted controlled experiments in formulating and refining our prompts to increase the quality and relevance of ChatGPT's generated story text.

4.1 Basic Story Text

Instructing ChatGPT to generate an interactive story requires a prompt as simple as "Create an interactive story for children". The model then responds with a short story with a set of decision points, as seen in Table 3.

Table 3. Sample interactive story generated by ChatGPT from a simple prompt "Create an interactive story for children" with no constraints.

Title: The Enchanted Forest Adventure

Once upon a time, in a small village, there lived a curious and brave little boy named Leo. One sunny morning, Leo set out on an exciting adventure to the Enchanted Forest, a magical place filled with talking animals, hidden treasures, and enchanting creatures.

As Leo wandered deeper into the forest, he stumbled upon a talking squirrel named Sammy. Sammy greeted him with a cheeky smile and said, "Welcome to the Enchanted Forest, young explorer! To continue your adventure, you must solve a riddle."

Leo was intrigued and eagerly accepted the challenge. Sammy cleared his throat and asked, "What has a heart that doesn't beat?" A) A rock B) A tree C) A fish D) A bear

If you think the answer is A) A rock, turn to page 5.

If you think the answer is B) A tree, turn to page 6.

If you think the answer is C) A fish, turn to page 7.

As seen in the example, the default language used by ChatGPT is English and the story text exceeds 150 words. The different parts of the story are also not clearly marked. To address these, the simple prompt is refined to indicate the target language; the specific names of characters, location and event that should appear in the story; the response length; and the 5-part story structure. Aside from the system message shown in Table 1 that sets the stage for story generation with ChatGPT, story prompts and event prompts are sent to the LM at each dialogue turn to request for specific story text. Shown in Table 4 is a story prompt that requests ChatGPT to generate the *exposition* text. Also included in the prompt is an explicit constraint to “*only use the characters and locations you have been provided with*” to avoid the sudden appearance of story characters without their proper introduction.

Table 4. *Sample story prompt and corresponding story text generated by ChatGPT.*

User	Remember that the story should be written in Filipino, and only use the characters and locations you have been provided with. The main character of the story is a child named Justine and the story takes place in the Living Room of the House. The story's theme is practicing good hospitality to others. Let's start with Justine and Uncle Renato. Justine offers a drink to Renato.
ChatGPT	Exposition: Isang maganda at mainit na araw. Nasa living room si Justine kama and kanyang Uncle Renato. Si Justine ay isang masayahing bata na laging handang tumulong sa ibang tao. Si Uncle Renato naman ay isang masipag na tao na madalas bumibisita sa kanilang bahay upang magkuwentuhan.

4.2 Decision Points and Choice Generation

Interactive stories include key decision points where the children are presented with choices that influence how the story will move forward. In Kulturuan, the decision points are presented in the *rising action* and *falling action*. We conducted experiments to evaluate how ChatGPT generates choices, paying particular attention to the format and types of choices in the response. The following constraints in the system message prompt restricts the LM to conform to the specified template in generating a positive and a negative choice to enable the response parser to extract the choices and present these in the user interface.

Present the decision point in this format:

Ano ang gagawin ni Justine? (What should Justine do?)

Positive choice: <provide a short description>

Negative choice: <provide a short description>

Table 5 shows an example. Also illustrated in the table is the structure of a dialogue in ChatGPT's response, which is used by the response parser to determine if a given story text is narrated or delivered as a dialogue.

Table 5. *Sample story text containing decision points generated by ChatGPT.*

Rising Action:
Justine: Uncle Renato, gusto niyo po bang inumin ang aking gawaing juice? Ginawa ko po ito para sa inyo.
Uncle Renato: Salamat, Justine. Mabuti ka talagang bata. Oo, gusto ko nga ng isang mainit na inumin ngayong maininit na araw. Maraming salamat sa'yo.
Ano ang gagawin ni Justine?
Positive Choice: Ihandog kay Uncle Renato and gawing juice na may ngiti sa kanyang labi.
Negative Choice: Sabihin kay Uncle Renato na wala nang juice tumawid na lang sila sa kabilang bahay.

The choice of the child is formulated as a prompt and sent to ChatGPT to request for the outcome of such a decision. An example is shown in Table 6.

Table 6. *Sample story prompt with the child's choice and the subsequent story text.*

User	I choose the positive choice, continue the story.
ChatGPT	<p>Climax: Justine: (may ngiti sa kanyang labi) Ito po, Uncle Renato. Sana'y magustuhan niyo ang aking gawaing juice.</p> <p>Uncle Renato: (kinuha ang baso ng juice at ngumiti) Maraming salamat, Justine. Ang sarap ng juice mo! Talagang napasaya mo ako ngayong araw.</p> <p>Nagpatuloy ang kanilang kwentuhan habang nag-eenjoy sila sa juice na handog ni Justine. Habang nagmamadali ang oras. Biglang may narinig silang kalabog mula sa kusina.</p> <p>Falling Action: Justine:(nag-aalala) Uncle Renato, may narinig akong kalabos sa kusina. Baka may nagyaring hingi maganda. Dapat po ba tayong pumunta at tingnan kung ano iyon?</p> <p>Ano ang gagawin ni Justine?</p> <p>Positive Choice: Tumakbo papunta sa kusina upang masiguradong walang problema. Negative Choice: Tumuloy lang sa kwentuhan at hayaan na lang ang kalabog sa kusina</p>
User	I choose the negative choice, continue the story.
ChatGPT	<p>Climax: Uncle Renato: Huwag kang mag-alala, Justine. Baka may tao lang na nagkamali ng lagay ng mga kawali sa kusina. Hayaan na nating magpatuloy ang ating kwentuhan.</p> <p>Nagpatuloy sila sa kanilang kwentuhan at hindi na pinansin ang kalabog sa kusina. Ngunit habang nagpatuloy ang kanilang pag-uusap, biglang dumating si Auntie Marissa, ang ina ni Justine.</p>

It was noticed that ChatGPT may at times deviate from following the prescribed 5-part structure for indicating the parts of the story and presenting the choices. An instance of this is depicted in Table 7 where the LM presented the full story as one response, given the same story prompt shown in Table 4. Addressing this deviation will be part of our future work.

4.3 Vocabulary

Stories can serve as an avenue for children to acquire language and increase their vocabulary. Thus, it is essential for ChatGPT to produce story text that uses Filipino words suitable for the intended audience. Tests were conducted to determine if ChatGPT uses Filipino vocabulary that are familiar for young children. Prompts containing the story characters and location were created. Table 7 illustrates the responses from the LM with the target audience (*“for children”*) explicitly indicated in *Test Case 2*. As seen in column 2, *Test Case 2* uses simpler words to describe the stranger, i.e., *“isang taong di niya kilala”* (a person he does not know) as opposed to the unfamiliar word *“estranghero”* (stranger). an example response from the LM using an uncommon word in Filipino when it translated the word “stranger” into “estranghero,” which can be complicated for children to understand.

Table 7. *Sample response of ChatGPT containing the full story text and disregarding the given structure and template.*

Noong isang malamig na gabi, nasa sala ng bahay sina Justine at Uncle Renato. Si Justine ay isang batang mabait at maalalahanin na laging handang tumulong sa ibang tao. Siya ay may malambot na puso at gusto niyang iparamdam sa lahat ng kanyang nakakasalamuha ang mainit na pag-aalaga at kabaitan.
"Uncle Renato, mainit po ba kayo?" tanong ni Justine na may ngiti sa kanyang labi.
"Talaga bang mayroon kang mainit na inumin, Justine?" sabi ni Uncle Renato habang inaayos ang kanyang mga damit. "Salamat naman sa inyong pag-aalala."
"Opo, Uncle Renato! Mayroon po akong tsaa na nilagang saging. Gusto niyo po ba?" sagot ni Justine na puno ng excitement.
Napangiti si Uncle Renato at nagpatuloy sa pag-aayos ng kanyang mga sapatos. "Salamat, Justin. Tunay nga ngang napakabuti mong bata."
...
Inilapag ni Justine ang tasa sa mesa at umupo sa tabi ni Uncle Renato. Habang umiinom sila, nagkuwentuhan sila tungkol sa kanilang mga karanasan at mga pangarap. Napuno ang sala ng tawa at ligaya, at sa bawat sandali, lumalalim ang pagkakaibigan nina Justin at Uncle Renato.
Sa simpleng pag-aalaga ni Justine at sa pagiging magiliw ni Uncle Renato, naipakita nila ang kahalagahan ng mabuting pananawagan at kabaitan sa isa't isa. Ipinakita nila na sa pamamagitan ng simpleng pagbibigay ng inumin, nagawa nilang palakasin ang kanilang samahan at magbigay ng kasiyahan sa isa't isa.
....

Table 8. *Comparison of output using prompts with and without target audience indication.*

Prompt	ChatGPT
Test Case 1. Create a sentence in Filipino about interaction between Justine and a stranger.	Nakita ni Justine ang <u>isang estranghero</u> na naglalakad sa kalsada at nagpasya siyang lumapit sa kanya.
Test Case 2. Create a sentence <u>for children</u> in Filipino about interaction between Justine and a stranger.	Nakita ni Justine ang <u>isang taong di niya kilala</u> na naglalakad sa kalsada at nagtatakdang kung ano ang sasabihin nito.

5. Discussion

Our study makes an innovative attempt at integrating Generative AI, particularly ChatGPT, with the domain of interactive storytelling for educational purposes. Much of the potential that generative AI can contribute to this field lies in the model's ability to produce relevant story text with the target theme to impart cultural values. For this to happen, it is imperative that prompts are properly formulated to direct ChatGPT in performing the expected task and response. Following the design principles outlined in Mayo (2023) and (Zhao, 2023), our experiments confirmed the essential guidelines below in the formulation of prompts.

Clear task descriptions. Prompt should give a clear description of the task to enable ChatGPT to carry out the instruction and generate the desired response. In Kulturuan, these descriptions include the role of the LM (storyteller), input data (story character, location), expected output (story), and response restrictions.

State explicit constraints. Constraints include (i) the format of the expected response, i.e., 5-part story structure; (ii) the intended audience, i.e., Filipino children who are between 6 - 9 years old; (iii) the language; and (iv) the response length.

Provide more context. Contextual information allows the LM to understand the scope and purpose of the request. In Kulturuan, these are the specification of the 5 parts of the story and the decision points, i.e., two choices for the activities that a child may do in the living room.

Decompose the task. It is also important to decompose instructions into smaller and more detailed subtasks to avoid overloading the LM with information.

Issue follow-up prompts. When a prompt is decomposed into smaller subtasks, follow-up prompts can be issued that make additional requests to form a cohesive conversation thread. This is particularly useful in our study where we ask ChatGPT to formulate different parts of an interactive story, such as the setting, the problem or conflict, and the resolution.

Refine the prompt. To improve the quality and relevance of the generated story text, prompts must be iteratively refined through experimentation. While this does not guarantee that ChatGPT will consistently generate good quality and relevant story text, experiments can shed insights on the extent of the LM's capabilities and limitations, allowing downstream tasks to address the gap in ChatGPT's response generation and storytelling abilities.

Through prompt engineering, generative AI can bridge narrative science with natural language processing strategies to deliver an interactive learning environment for children to learn about culture and values. While our study barely scratched the surface on prompt engineering, conducting user experience studies among the target audience can provide empirical evidence on the impact of Kulturuan on the students' learning performance, engagement, and appreciation of the hospitality value. Interviews with educators and writers of children's stories may also provide valuable feedback on the relevance of an AI-based technology in cultural narrative generation.

6. Conclusion

Kulturuan is an interactive storytelling environment designed to deliver the Filipino value of *pakikipagkapwa-tao* or hospitality to children who are 6 to 9 years old. Generative AI, specifically ChatGPT, is utilized as the knowledge resource in the generation of the interactive stories. Controlled experiments highlighted the importance of properly formulated prompts in enabling the model to produce story text that are relevant to the story theme, leading to a set of guidelines in prompt engineering. However, downstream tasks such as a response parser are needed to process the resulting text of ChatGPT to fully align with the requirements of the Kulturuan environment. Further work includes enhancing the performance of the *response parser* in verifying the consistency and controlling the randomness of ChatGPT's generated text. Future empirical evaluation with child educators and literary experts can lead to valuable insights on the quality of the resulting stories in imparting the target values and the overall relevance and effectiveness of the system as an environment for learning. Children can share their perception on the use of Kulturuan as an educational resource to understand and appreciate Filipino culture and values.

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