WonderLens: Fostering Empathy Through Interactive Character Perspective-Taking

Jingxuan Ren
Graduate School of Education
University of Pennsylvania
Philadelphia, Pennsylvania, USA
renjx@upenn.edu

ABSTRACT

WonderLens is an innovative interactive reading tool that transforms traditional third-person narratives into immersive first-person experiences, fostering empathy and deeper engagement. By shifting the narrative lens, readers explore parallel first-person character perspectives, enabling a more intimate connection to the emotional and cognitive dimensions of the story. Grounded in theories of multiple text use, perspective-taking, and Theory of Mind, WonderLens introduces features such as emotion tagging, reflective prompts, and choice-driven narratives to bridge cognitive and emotional empathy [2], [4]. This paper outlines the system's design, theoretical underpinnings, and an evaluation plan to assess its effectiveness in fostering empathy, enhancing perspective-taking, and delivering an engaging user experience.

CONCEPTS

• Human-centered computing → Interaction paradigms;
• Applied computing → Interactive learning environments;
• Educational topics → Empathy and perspective-taking.

KEYWORDS

Interactive storytelling; first-person narratives; empathy-building; perspective-taking; Theory of Mind (ToM)

1 Introduction

Traditional storytelling predominantly uses third-person narratives to provide a comprehensive view of characters and events. While this approach offers clarity and neutrality, it often keeps readers at an emotional distance, limiting their ability to deeply connect with the characters. WonderLens reimagines this dynamic by introducing a shift from third-person to first-person narratives, immersing readers in the minds and emotions of the characters themselves. This novel perspective invites readers to experience stories through the eyes of the protagonists, fostering a heightened sense of empathy and engagement.

This transformation from third-person to first-person narratives aligns with recent research on immersive learning and empathy development. By stepping into a character's shoes, readers engage in evaluative perspective-taking, a critical process for developing both emotional and cognitive empathy [1], [9]. Moreover, WonderLens complements this shift with parallel narrative exploration, allowing users to juxtapose multiple first-person perspectives of the same event, deepening their understanding of interpersonal dynamics.

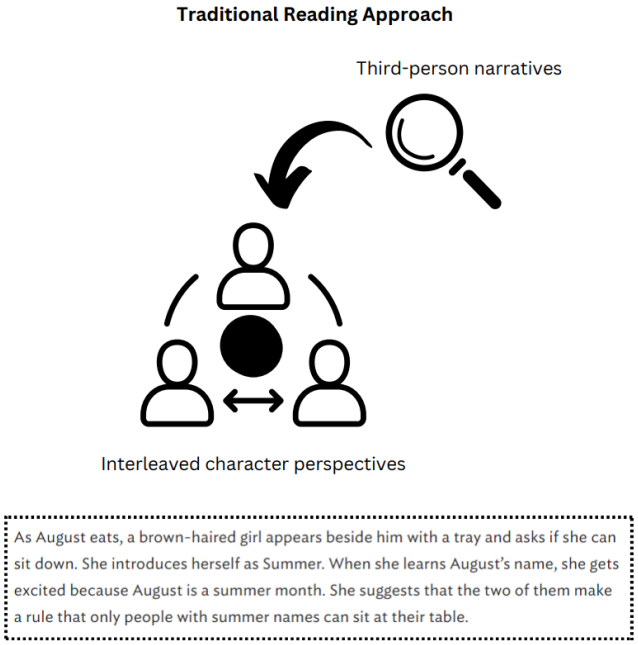

Figure 1: Example of the Traditional Reading Approach

2 Related Work

Empathy-building through storytelling has been a central focus in educational psychology, digital humanities, and human-computer interaction (HCI). Various tools and frameworks have aimed to engage readers in emotional and cognitive perspective-taking, yet significant gaps remain, particularly in transforming narrative perspectives and enabling comparative exploration of parallel narratives.

2.1 Third-Person vs. First-Person Narratives

Traditional narratives often employ a third-person perspective, offering a detached and omniscient view of characters and events. While this provides clarity, it tends to limit the reader's emotional

engagement. Research in narrative psychology highlights that first-person perspectives create deeper immersion by allowing readers to internalize a character's experiences and emotions [1]. However, tools designed to transform third-person narratives into first-person experiences remain scarce.

Existing interactive storytelling platforms, such as Twine or ChoiceScript, often integrate first-person perspectives but lack mechanisms for dynamically transitioning between third- and first-person viewpoints. WonderLens addresses this by actively converting third-person narratives into first-person formats, offering readers an intimate emotional connection and a novel lens for exploring character experiences

2.2 Parallel Narratives in Digital Storytelling

Parallel narrative exploration—allowing readers to view the same event through multiple characters' perspectives—is another underexplored area. Tools like visual novels or decision-based games enable branching storylines but often isolate character viewpoints rather than juxtaposing them. The concept of parallel perspectives aligns with the Integrated Framework of Multiple Texts [2], which emphasizes the cognitive benefits of synthesizing information across texts.

WonderLens extends this framework by situating parallel narratives in an interactive format. By enabling side-by-side comparison of first-person perspectives, the system fosters evaluative empathy, requiring readers to reconcile differences in character emotions and motivations. This approach differs from prior works by providing structured tools, such as reflective prompts and tagging, to guide readers in synthesizing insights across perspectives.

2.3 Emotion-Centric Tools

Emotion tagging and reflective activities are well-established in educational interventions aimed at fostering empathy [3], [7]. Digital tools like Replika and journaling apps have adopted similar methods to enhance self-reflection and emotional understanding. However, these tools are often introspective and lack integration into narrative contexts.

WonderLens integrates emotion tagging directly into the reading experience, encouraging readers to actively analyze and connect with characters' emotions. Reflective prompts further engage users in metacognitive activities, such as evaluating how a character's decisions align with their own emotional reasoning. This dual focus on emotional and cognitive empathy situates WonderLens uniquely among existing empathy-building tools.

2.4 Theory of Mind and Interactive Media

Theory of Mind (ToM), defined as the ability to attribute mental states to oneself and others, is critical for understanding and predicting behavior in social interactions [4], [6]. Digital media, particularly interactive storytelling, has been shown to activate ToM processes by requiring users to infer characters' intentions and emotions [5].

WonderLens builds upon these findings by combining ToM principles with interactivity. Through choice-driven narratives, readers engage in evaluative perspective-taking, actively considering the consequences of their decisions on characters' emotional states. Unlike static media, this dynamic interaction deepens readers' understanding of complex social scenarios.

3 Design Features

The development of WonderLens is rooted in a commitment to enhancing narrative exploration through innovative design and interaction strategies. This platform aims to transform traditional storytelling into an immersive, emotionally engaging, and personalized experience. By leveraging techniques such as first-person perspectives, emotion-centric engagement tools, and interactive personalization, WonderLens provides users with an opportunity to deeply explore characters' experiences and motivations. Furthermore, a focus on accessibility ensures that this experience is inclusive and intuitive for diverse audiences. The design goals outlined below detail the foundational principles guiding the development of WonderLens.

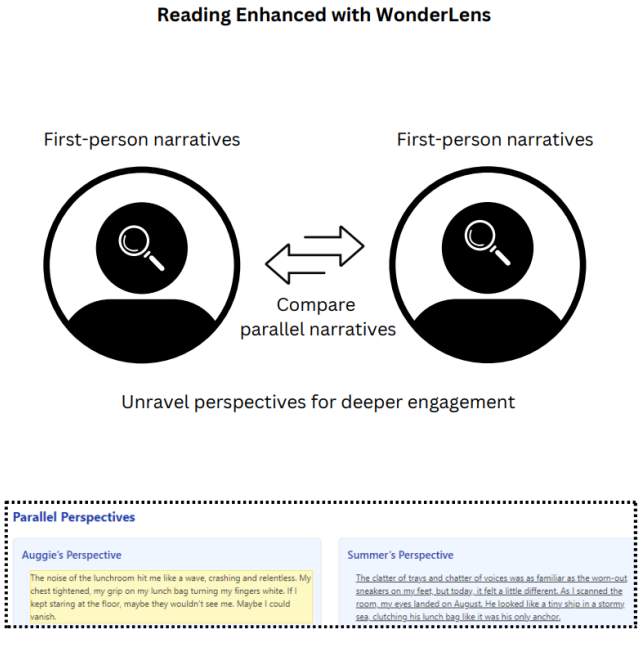

Figure 2: Reading Enhanced with WonderLens

3.1 Perspective Transformation

One of the primary goals of WonderLens is to shift traditional third-person narratives into immersive first-person perspectives. This transformation enhances emotional connection by placing users directly in the shoes of the characters, enabling a deeper understanding of their experiences. By adopting this approach, WonderLens not only enriches narrative immersion but also encourages users to empathize with diverse viewpoints.

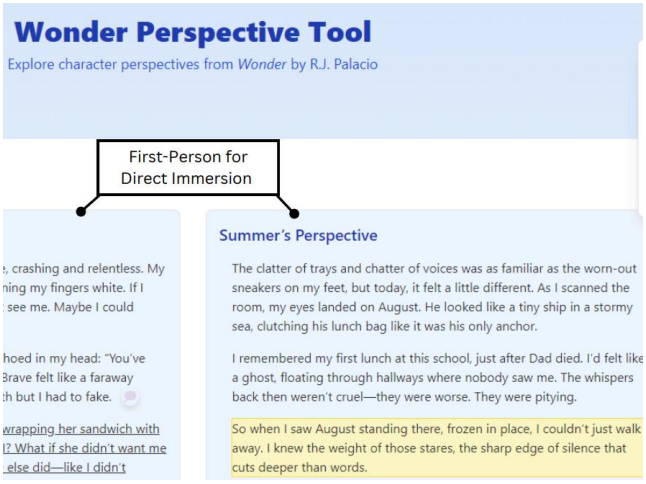

Figure 3: First-Person for Direct Immersion

3.2 Parallel Perspective Exploration

WonderLens facilitates the simultaneous exploration of multiple first-person narratives of the same event. This feature enables users to compare and contrast different characters' emotional and cognitive perspectives, fostering cognitive empathy. By providing a framework for side-by-side narrative analysis, the platform helps users develop a nuanced understanding of complex scenarios and the diversity of human experiences.

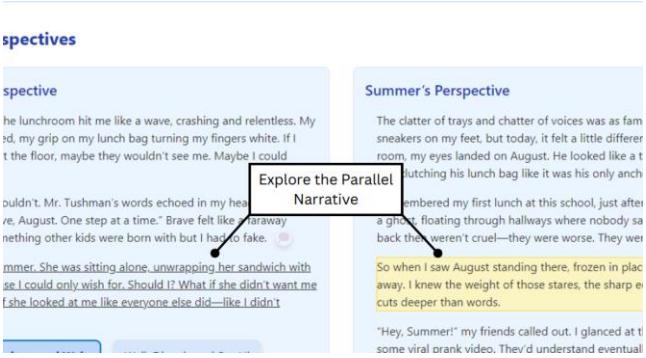

Figure 4: Parallel Narrative for Compare and Contrast

3.3 Emotion Tagging

To deepen users' emotional engagement, WonderLens integrates tools for emotion tagging and reflective prompts. These features encourage active reflection on characters' feelings and motivations, fostering a deeper connection with the narrative [3], [9]. By engaging users in this manner, the platform supports the development of empathy and critical thinking, making the storytelling experience both meaningful and thought-provoking.

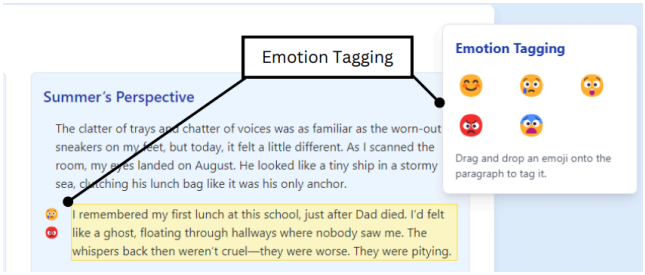

Figure 5: Drag-and-Drop Emotion Tagging

3.4 In-Place Reflection Prompt

In-place reflection prompts are designed to encourage users to actively engage with the narrative at critical moments. These prompts appear seamlessly within the narrative flow, inviting readers to pause and reflect on characters' motivations, emotions, and decisions. By situating these reflective opportunities directly within the context of the story, users can develop a deeper understanding of the emotional and cognitive dimensions of the narrative, fostering empathy and critical thinking without disrupting the immersive experience.

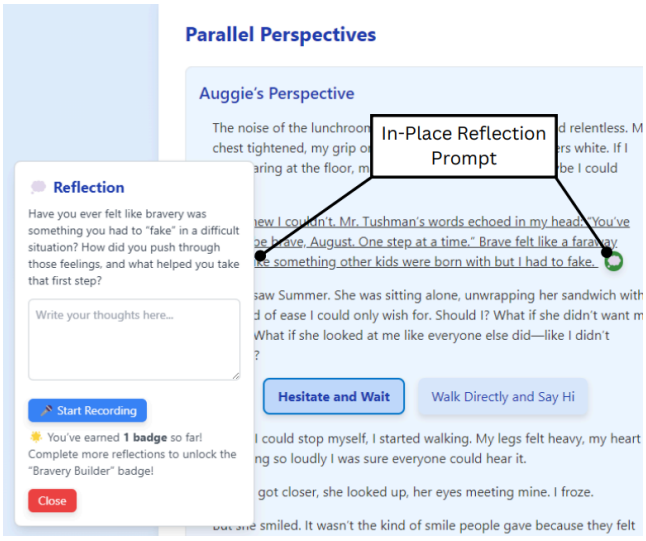

Figure 6: In-Place Reflection Prompt

3.5 Choice-Driven Narrative

The choice-driven narrative structure empowers users to shape the story by making decisions that influence its progression. This interactivity not only enhances user engagement but also reinforces the personal relevance of the narrative. By allowing readers to explore different outcomes based on their choices, the platform supports experiential learning and encourages users to consider the consequences of various actions, further immersing them in the narrative's emotional and moral complexities.

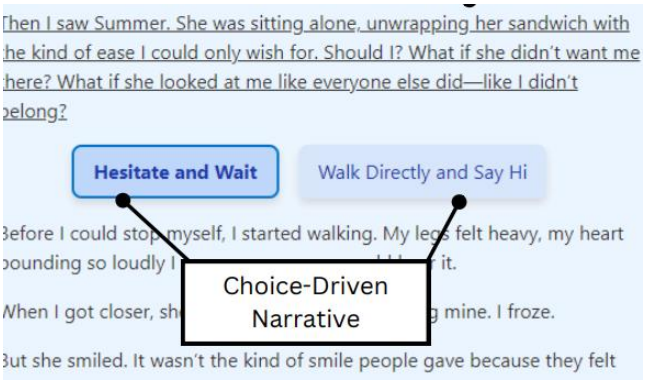

Figure 7: Choice-Driven Narrative

3.6 Interactive Emotion-Based Activity

The Interactive Emotion-Based Activity in *WonderLens* is designed to engage learners in identifying, understanding, and applying emotion vocabulary in contextual scenarios. Through interactive tasks, such as drag-and-drop matching games, users are encouraged to associate specific emotion words (e.g., "Brave," "Scared," "Happy") with characters' experiences within a narrative. This activity fosters deeper emotional awareness while reinforcing vocabulary skills in a practical and engaging way.

By integrating contextual prompts, such as "I felt [drag emotion here] when I tried sitting with someone new," the activity encourages learners to reflect on and articulate the emotional states of characters.

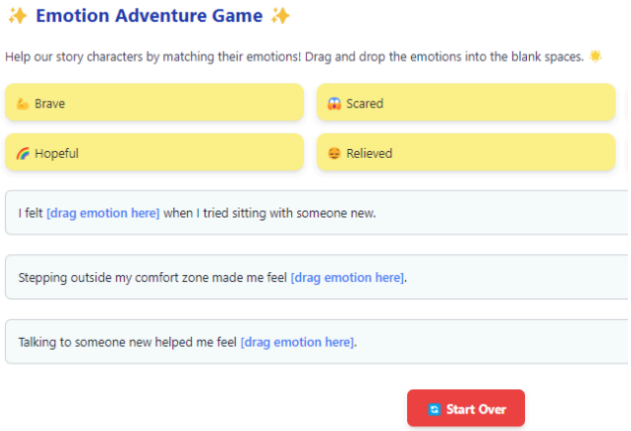

Figure 8: Emotion-Based Activity

3.7 Personalized Auggie Drawings

Personalized Auggie drawings provide a visually engaging and customizable element to the platform. These character illustrations adapt to user inputs, creating a more personalized and relatable experience. By integrating tailored visuals into the storytelling process, *WonderLens* fosters a stronger emotional connection and enhances the overall immersion, ensuring that users feel personally invested in the narrative and its characters.

Figure 8: Personalized Auggie Drawings

4 Theoretical Framework

This project builds upon three key theoretical frameworks to design an interactive tool that enhances reading experiences and fosters Social and Emotional Learning (SEL) through perspective-taking, empathy-building, and cognitive development.

4.1 Integrated Framework of Multiple Texts

This study draws upon the integrated framework of multiple texts, as proposed by List and Alexander (2019), to explore strategies for engaging readers with diverse textual content. The execution stage of this framework emphasizes three interconnected dimensions: metacognitive strategies, cognitive strategies, and behavioral skills.

Metacognitive strategies encompass reflective practices like comprehension monitoring and the evaluation of cognitive product formation. For instance, activities such as drawing characters like “Auggie” or engaging in an “Emotion Adventure Game” exemplify interactive methods that encourage metacognitive engagement. Cognitive strategies are divided into intra-textual and inter-textual approaches. Intra-text strategies focus on comprehension through macro-structural analysis, character perspective exploration, and relevance determination by tagging key emotional moments within a text. Inter-text strategies, on the other hand, emphasize perspective-taking through

comparing and contrasting character views across multiple texts and synthesizing these insights to form cohesive emotional and narrative understandings.

Behavioral skills support these strategies by enabling effective source access, navigation, and note-taking. Tools like hover-over highlights and drag-and-drop tagging facilitate parallel perspective navigation and promote reflective interaction with the text. By leveraging these strategies, the framework highlights a structured approach to fostering deeper cognitive engagement, enabling readers to connect with texts on multiple levels [2].

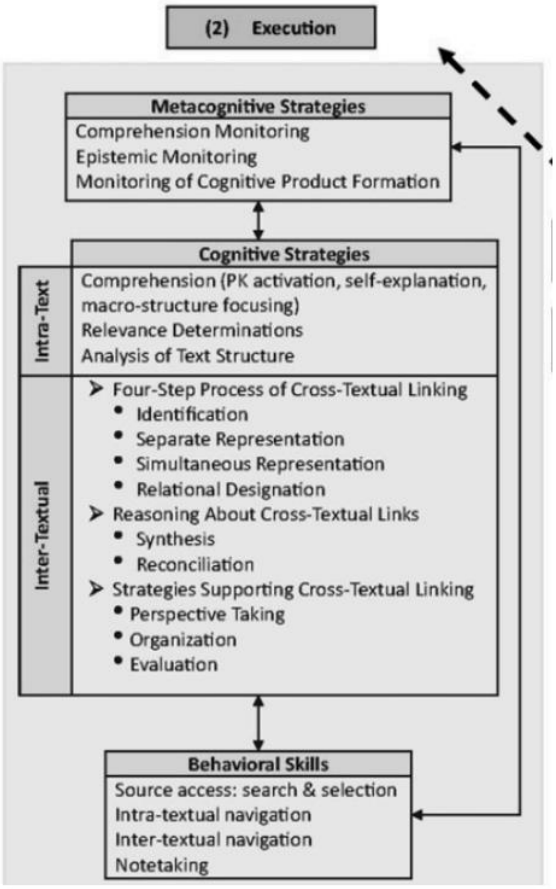

Figure 9: "Execution Stage" of Integrated Framework of Multiple Texts

4.2 Perspective-Taking

This study also integrates the framework of perspective-taking as delineated by Batson, Early, and Salvarani (1997), emphasizing two core dimensions: emotional empathy and cognitive empathy [3]. This dual approach highlights the mechanisms by which readers can deepen their engagement with textual content and characters.

Emotional empathy involves imagining how another person feels by actively engaging with their emotional states. Techniques such as emotion tagging, where readers imagine and label characters' feelings in specific scenarios, and reflective prompts, which connect the characters' emotions to the reader's own experiences, foster a personal connection to the narrative.

Cognitive empathy focuses on imagining oneself in another's situation, leveraging perspective-taking and evaluative reasoning. Through parallel perspectives, readers explore a scene from multiple characters' viewpoints, gaining insights into diverse motivations and reactions. Moreover, choice-driven narratives challenge readers to make decisions that impact the storyline, encouraging them to evaluate characters' emotions and motivations critically.

Together, these strategies engage readers on both an emotional and cognitive level, enhancing their understanding and connection to the text. By fostering a holistic empathetic response, this framework provides a robust foundation for designing interactive reading experiences that are both immersive and reflective.

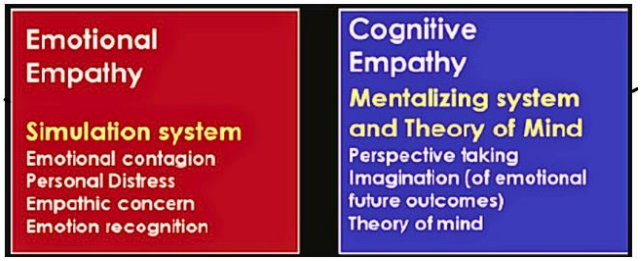

Figure 10: Emotional Empathy vs. Cognitive Empathy

4.3 Theory of Mind

This study further incorporates the Theory of Mind (ToM), as described by Premack and Woodruff (1978), to examine how readers attribute mental states—such as beliefs, desires, and emotions—to themselves and others. This ability is crucial for understanding and predicting behavior in social interactions, making it an essential foundation for interactive reading experiences [4], [6].

The relevance of ToM in this study lies in its emphasis on key strategies for enhancing reader engagement. Perspective-taking and exploring parallel perspectives enable readers to see events from multiple viewpoints, fostering a deeper understanding of character motivations. Recognizing and categorizing emotions enhances emotional intelligence by helping readers connect with the emotional landscape of narratives. Reflective thinking further solidifies comprehension by encouraging readers to evaluate the implications of actions and decisions.

A critical aspect of this framework is the evaluation of consequences through choice-driven narratives. By engaging readers in decision-making processes that influence story outcomes, the framework promotes critical thinking and empathy. The stages of Theory of Mind, from egocentric thinking to understanding others' perspectives, align with the progression readers experience when engaging with dynamic, interactive text environments. This alignment underscores ToM's role in creating meaningful and transformative reading interactions.

5 Evaluation Plans

This section complements the design and theoretical foundations of *WonderLens* by proposing strategies to assess its effectiveness and impact. This section provides a structured approach to validating the tool's capabilities in fostering empathy, enhancing perspective-taking, and delivering an engaging user experience.

5.1 Objectives

The evaluation is structured to achieve three primary objectives. The first objective is to measure the effectiveness of the tool in enhancing users' empathy and perspective-taking skills. This involves assessing the extent to which the system facilitates an improved understanding of diverse viewpoints, contributing to the development of key social-emotional competencies.

The second objective is to evaluate the system's usability and accessibility. This assessment ensures that the tool is both user-friendly and inclusive, accommodating a wide range of users and minimizing potential barriers to engagement. A focus on these aspects is critical for ensuring the system's practical applicability and broader adoption.

The final objective is to collect user feedback to inform the iterative refinement of WonderLens. By incorporating insights from users, future development efforts can address identified limitations and enhance the system's functionality and impact.

5.2 Methodology

The evaluation will employ a mixed-methods approach, integrating both quantitative and qualitative methods to ensure a holistic understanding of user experience and learning outcomes.

Quantitative Evaluation

The quantitative component will involve pre- and post-test assessments using validated measures, such as the Interpersonal Reactivity Index (IRI), to quantify changes in users' empathy and perspective-taking abilities. Additionally, user engagement metrics will be tracked, including the time spent on activities, the frequency of interactive tool usage, and completion rates for reflective prompts. These data points will provide objective indicators of user interaction and engagement with the tool.

Qualitative Evaluation

The qualitative component will include post-use surveys and semi-structured interviews to gather in-depth feedback from users. These methods will explore emotional, cognitive, and usability aspects of the tool, offering rich insights into the user experience. Furthermore, a comparative analysis will be conducted to examine differences in learning outcomes between participants engaging with WonderLens and those using traditional third-person narratives. This comparison will highlight the unique contributions of the tool to user learning and perspective-taking.

This mixed-methods design ensures that both measurable outcomes and nuanced user experiences are captured, providing a robust foundation for evaluating the tool's effectiveness and guiding future development.

5.3 Evaluation Design

The evaluation will be conducted with two distinct participant groups to facilitate a comparative analysis of the tool's impact. The **Experimental Group** will consist of participants who interact with WonderLens and its interactive features, such as emotion tagging and choice-driven narratives. The **Control Group** will engage with the same narratives presented in traditional, non-interactive formats. This design enables an examination of the added value provided by the interactive elements of WonderLens.

5.4 Metrics for Success

The success of the evaluation will be determined using the following key performance indicators:

- **Empathy Improvement:** Changes in empathy scores will be assessed through pre- and post-tests, using validated measures to quantify the development of perspective-taking skills.
- **User Feedback:** Positive responses to the interactive features, including emotion tagging and choice-driven narratives, will be collected to evaluate user satisfaction and perceived effectiveness.
- **Engagement Metrics:** Evidence of higher engagement levels, such as increased time spent interacting with the tool and completion rates, will be compared to those of traditional narrative formats.

6 Discussion and Conclusion

The development of WonderLens addresses significant gaps in traditional storytelling by transforming third-person narratives into immersive first-person perspectives, offering users a novel way to engage with characters and their experiences. This tool aligns with theoretical frameworks such as the Integrated Framework of Multiple Texts, perspective-taking, and Theory of Mind (ToM), which collectively underscore the potential of interactive storytelling to foster both emotional and cognitive empathy.

6.1 Key Contributions

WonderLens makes several key contributions to the field of interactive storytelling and empathy-building:

- **Perspective Transformation**: By enabling dynamic shifts between third- and first-person narratives, WonderLens fosters a deeper emotional connection with characters, promoting empathy and engagement.
- **Parallel Perspective Exploration**: The side-by-side comparison of multiple characters' viewpoints allows users to synthesize diverse perspectives, cultivating evaluative empathy and nuanced understanding of interpersonal dynamics.
- **Emotion-Centric Tools**: The integration of emotion tagging and reflective prompts provides structured opportunities for readers to connect emotionally and cognitively with the narrative, enhancing both metacognitive and critical thinking skills.
- **Choice-Driven Narratives**: By empowering users to make decisions that shape the story, WonderLens bridges the gap between passive reading and active participation, reinforcing experiential learning and moral reasoning.
- **Accessibility and Usability**: The tool's intuitive design ensures inclusivity for diverse audiences, offering a seamless and engaging user experience.

6.2 Limitations and Future Directions

While WonderLens demonstrates promise in enhancing empathy and engagement, several limitations must be addressed in future iterations:

- **Scalability**: Expanding the platform to accommodate diverse narrative genres and languages will require additional research and development.
- **Longitudinal Impact**: Further studies are needed to evaluate the long-term effects of WonderLens on empathy and perspective-taking skills.
- **Integration into Educational Settings**: Collaborations with educators and curriculum designers can help tailor WonderLens for classroom use, aligning it with broader SEL goals.

Future work could explore integrating advanced natural language processing (NLP) technologies to enable real-time narrative adaptation and user input analysis. Additionally, incorporating virtual or augmented reality (VR/AR) elements could further enhance the immersive experience, offering users a multisensory approach to storytelling.

6.3 Conclusion

WonderLens represents a transformative step in interactive storytelling, bridging the gap between narrative engagement and empathy-building. By combining theoretical frameworks with innovative design features, the tool provides a dynamic and reflective reading experience that fosters deeper connections with characters and their stories. As an educational and interactive platform, WonderLens holds the potential to shape how we understand and engage with narratives, paving the way for new opportunities in learning, storytelling, and empathy-driven design.

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