From Crafting Text to Crafting Thought:
Grounding Intelligent Writing Support to Writing Center Pedagogy

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Abstract

Intelligent writing support tools have evolved from solving surface-level issues to collaborating and creating language with writers. Along with these new capabilities come concerns that generated fluent text can impact writers' processes in unintended ways, especially for students. In this workshop paper, we look to a similar transition that writing centers experienced over the last century, which shifted focus from fixing surface-level issues to maintaining student writer voices. We interviewed 10 current writing tutors and grounded their described practices with ideas proposed in writing center literature. We employed these strategies in developing an intelligent writing tool prototype. We describe the design of our tool and discuss potential evaluations along with how to foster deeper relationships between writers and writing centers using intelligent writing tools.

1 Introduction

With the emergence of large language models (LLMs) and the advanced text processing capabilities they entail, writing tools have undergone a fundamental transformation from fixing surface-level issues to creating spaces for collaboration and co-creation between writers and AI agents. Commercial systems and research prototypes alike have expanded beyond suggesting grammar, spelling, and sentence structure revisions (Ding and Zou, 2024) to helping writers reflect on the logical coherence and flow of their writing (Dang et al., 2022), overcome writer's block (Tica and Krsmanović, 2024), gain new perspectives and ideas (Gero et al., 2022; Gero and Chilton, 2019), and develop deeper awareness of potential reader audiences (Benharrak et al., 2024). This transformation has fostered surging interest in both Human-Computer Interaction (HCI) and Natural Language Processing (NLP) communities to develop systems and agents that can aid writers throughout their diverse writing practices.

Yet, it is not clear how writing tools will impact these writing practices, for better or worse. This concern is especially vital for student writers, who are still developing their own writing processes (Andre and Schneider, 2004; Moore, 2016). Writing tools hold the promise of supporting student learning, but the fluent text generated by many tools might dilute students' perception of ownership (Islam and Greenwood, 2024) or open up risks of plagiarism (King and ChatGPT, 2023).

The transition in writing tools today—and the concerns this transition raises—echoes the evolution of university writing centers over the last century. Around 80 years ago, writing centers, then referred to as writing "labs" or "clinics," began emerging at universities across the United States, aimed at addressing student writing problems (Carino, 1995, 1996). Much like how many writers today use automated writing assistants to finalize their writing, these centers functioned as fix-up shops, "cleaning up" students' papers individually before submission (Carino, 1995; North, 1984). 40 years later the purpose of writing centers began to shift. Writing centers became more writer-centered rather than curriculum-centered, process-oriented rather than product-oriented, and collaborative rather than instructional (Carino, 1995; North, 1984). In response to growing concerns of student ownership and plagiarism amid these changes, writing centers developed strategies that realized the vision of collaborative writing spaces while centering the student within the writing process (Brooks, 1991; Ryan and Zimmerelli, 2012; Thompson and Mackiewicz, 2011). Writing centers have since become a widespread and successful resource across institutions worldwide (Archer, 2010; Tan, 2011), demonstrating the value of collaborative support in students' writing (Boquet and Lerner, 2008).

In this workshop paper, we explore the parallels between writing centers and intelligent writing

tools to rethink the roles of writing support tools in the age of LLMs. We ask the question, **how can intelligent writing support tools facilitate writer-centered, process-oriented, and collaborative writing sessions?** To answer this question, we first conducted an interview study with 10 current writing tutors at 3 US-based university writing centers to explore their strategies during writing sessions and their experiences with AI in writing. This formative study grounded the high-level ideas proposed in writing center literature (North, 1984; Highline Writing Center, 2024; Thompson and Mackiewicz, 2011) to concrete practices. We synthesized these practices into design guidelines focused on creating writer-centered, process-oriented, and collaborative writing sessions.

We illustrate how writing center strategies can guide the development of writing support tools by developing an LLM-based prototype writing tool, *Writor*, based on our design guidelines. *Writor* supports two writing stages based on the stages described to us by the writing tutors (§3) and prior writing center literature (§2): goal setting (§5.2) and editing (§5.3). In the goal setting stage, *Writor* prompts the writer to reflect on the assignment and potential readers, synthesizing a set of goals with writer input. Using these goals, *Writor* provides feedback and suggestions to writers grounded to a submitted draft in the editing stage. Writers can follow up on feedback or request additional feedback by highlighting sections of their text.

Crucially, *Writor* is designed to never give text verbatim to a writer. Instead, *Writor* employs feedback strategies tutors highlighted in our interviews, such as asking questions, providing writing suggestions that are topically distinct from the current writing, or pointing to sections of a writers' own text that can serve as guides for revision. We end by discussing potential evaluations of *Writor* and ways to foster relationships between writers, writing centers, and intelligent writing tools.

2 Related Work

2.1 Writing with AI

AI-powered writing tools now span a spectrum of feedback provision, from surface-level grammar and spelling corrections such as Grammarly[1] to broader adjustments to structure (Weber et al., 2024; Meyer et al., 2024; Han et al., 2024; Yang et al., 2024), language (Wambsganss et al., 2022;

Meyer et al., 2024; Han et al., 2024), and adherence to writing requirements (Dai et al., 2023; Han et al., 2024). These tools have shifted from simple rule-based systems (Ding and Zou, 2024; Ware, 2011) to sophisticated AI-driven assistants that analyze and generate writing feedback at multiple levels.

To support writers, AI tools employ a range of feedback techniques. Some use Socratic questioning to prompt deeper reflection and critical thinking (Kim and Tan, 2023; Arnold et al., 2021), while others provide continuous summaries to help writers reflect through their writing processes (Dang et al., 2022). Some AI writing assistants, such as those explored by Kreminski and Martens (2022), attempt to align feedback with a writer's values and intentions, ensuring that suggestions are contextually relevant. Gero et al. (2023) also points out having conversational exchanges with computers as a form of receiving feedback. Additionally, many AI systems take a generative approach for feedback, offering text suggestions or rewriting sections for the writer (Yang et al., 2024; Ding and Zou, 2024).

In addition to feedback-oriented tools, many writing assistants offer more direct intervention. Systems like CoAuthor (Lee et al., 2022) and Wordcraft (Yuan et al., 2022) actively participate in text creation. The widespread usages of general-purpose LLMs has further accelerated this trend, as users can employ these models to draft texts such as emails and essays (King and ChatGPT, 2023). This direct generation approach raises important questions about authorship (Islam and Greenwood, 2024) and what it means to develop authentic writing skills in an AI-augmented environment (Tseng and Warschauer, 2023).

Considering the ethical concerns surrounding generative texts and need for a structured approach to effective writing feedback, we draw on existing writing and writing pedagogy theories to inform AI writing support. These pedagogical frameworks highlight writer agency, process over product, and non-directive feedback (Ryan and Zimmerelli, 2012; Duke Writing Center, 2024; Highline Writing Center, 2024; North, 1984), offering a principled alternative to fully generative approaches.

To situate our work in the broader landscape of writing assistant design, we build on the framework proposed by Lee et al. (2024), which maps five key aspects of writing assistants: task, user, technology, interaction, and ecosystem. Our work contributes

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[1] www.grammarly.com

most directly to the user, interaction, and ecosystem aspects, focusing on how writing assistants can embody principles from writing center pedagogy to better support writers' learning and development.

2.2 Writing and Writing Center Pedagogy

Current writing center pedagogy has been largely influenced by North (1984)'s seminal essay "The Idea of a Writing Center" in 1984. Since then, these ideas have evolved into more specific strategies. This section synthesizes writing center pedagogy into three distinct, interconnected themes of writing support: 1) writer-centered, 2) process-oriented, and 3) collaborative.

The *writer-centered approach* tailors support to "the writers it serves" rather than to fixed curricula (North, 1984). To foster a writer-centered environment, writing center literature has developed a set of individualized scaffolding techniques. One key type of scaffolding is motivational scaffolding, which aims to cultivate students' interests in writing tasks and encourage their persistent engagement with writing processes (Ryan and Zimmerelli, 2012; Mackiewicz and Thompson, 2013; Cromley and Azevedo, 2005; David Wood, 1976). Some motivational scaffolding practices include offering genuine praise for specific accomplishments, expressing encouragement that builds confidence, and demonstrating sympathy and empathy regarding the difficulties inherent in complex writing tasks (Mackiewicz and Thompson, 2013). Other scaffolding techniques include setting agendas with writers oriented around their goals (Ryan and Zimmerelli, 2012), negotiating priorities for the sessions (Ryan and Zimmerelli, 2012), and acknowledging writers' cultural and linguistic backgrounds to adjust tutoring styles (Kilborn, 1994).

A *process-oriented approach* to writing instruction emphasizes developing writers' skills over writers' texts (North, 1984). One influential framework within this approach is minimalist tutoring. Initially focused on promoting student ownership of their work (Braun and Clarke, 2006), minimalist tutoring later evolved into a widely accepted strategy for fostering student learning by minimizing direct intervention (Ryan and Zimmerelli, 2012). Instead of providing students with explicit corrections, minimalist tutoring encourages them to engage actively in the writing process (Brooks, 1991). In minimalist, non-directive tutoring, tutors facilitate discussion, prompting students to articulate their thoughts, evaluate their arguments, and take control of revisions (Ryan and Zimmerelli, 2012; Brooks, 1991; Clark, 2001). Ultimately, the goal of minimalist tutoring is to cultivate independent writers who can critically assess and refine their work (Ryan and Zimmerelli, 2012).

Writing center literature further reinforces this process-oriented philosophy through several scaffolding techniques to give feedback that encourages students to engage with their writing and build up their writing skills (Ryan and Zimmerelli, 2012). Key scaffolding strategies include reacting as a reader, where tutors provide feedback from the perspective of an imagined reader; prompting for clarification, where tutors ask open-ended questions to encourage students to expand on their ideas; and metacommentary, where tutors explain the reasoning behind feedback to help students internalize the revision process (Ryan and Zimmerelli, 2012).

For providing feedback, writing centers employ a Higher Order and Lower Order Concerns framework (HOCs and LOCs, respectively). The framework prioritizes writing revisions by addressing HOCs—global issues like argumentation, organization, and clarity—before LOCs such as grammar and punctuation (Purdue Online Writing Lab (OWL), 2024; Duke Writing Center, 2024; Highline Writing Center, 2024). This framework further encourages tutors to touch on the high-level issues to foster learning and the writing process.

A *collaborative approach* in writing centers emphasizes partnership between tutors and writers rather than a hierarchical instructional model (North, 1984). Instead of tutors simply directing students, both parties engage in dialogue. Writing center literature shows that collaborative approaches encourage critical thinking (Bruffee, 1984) and deeper engagement with writing (Manning et al., 2012; Thompson, 2009). Through discussion, tutors provoke thought in a social context, encouraging active learning (Bruffee, 1984).

Moreover, writing itself is often viewed as a re-externalized conversation, meaning that the writing process mirrors the way ideas are developed and refined through dialogue (Bruffee, 1984; McAndrew and Reigstad, 2001). By engaging in dialogic interactions about their writing, students can improve their ability to articulate ideas clearly, refine their arguments, and thereby develop stronger writing skills overall (Ryan and Zimmerelli, 2012).

3 Interview Study

Writing center principles introduce a framework to help focus the development of intelligent writing tools. To ground the writing center principles introduced in §2 into practical guidelines, we examined how writing tutors implement them in real tutoring sessions through semi-structured interviews.

The study was guided by two research questions:

1. What strategies do writing tutors use to support students, and how are these strategies implemented during tutoring sessions?

2. What are tutors' perspectives on how AI could support or transform writing center practices?

This study was approved by the relevant Institutional Review Board. The interview schedule is included in the Appendix A.

3.1 Procedure

We recruited 10 writing center tutors (6 graduate, 4 undergraduate) from three universities (2 private, 1 public) located in the United States [2]. Recruitment was done through university email lists, fliers, and participant referrals. Tutoring experience ranged from 3 months to 5 years (mean=1.95 years, SD=1.54 years). All interviews were conducted via Zoom in English. Each interview lasted approximately one hour, and each participant was compensated with a $20 Amazon gift card. Each interview was audio-recorded, transcribed, and anonymized.

To identify themes and strategies tutors used to support student writing processes, we conducted a reflexive thematic analysis on the transcribed interviews following (Braun and Clarke, 2006). One author familiarized themselves with the interview data and made initial notes on tutoring strategies and themes. This author created an initial set of codes for individual strategies (e.g., "reading aloud") and iterated on these codes through discussions with another author. Iteration happened weekly during in-person discussions over the course of a month and included the second author and first author recoding the same interview transcript and meeting to resolve differences in codes. Following iteration, the authors reviewed the strategies and transcripts collectively to assess supporting evidence for each strategy. After refining the strategies, the first author revisited the data

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and checked for consistency between strategies and observations from the study. Below we describe the strategies surfaced by our interviews, organized around the writing center literature's characterization of writing support as *writer-centered*, *process-oriented*, and *collaborative*.

3.2 Writing Support is *Writer-Centered*

Empathy and Building Confidence. *"How do you feel?"* Six out of ten tutors mentioned this specific phrase during their interviews as they described what they would typically say to students. Empathy and confidence building emerged as an important writer-centered approach, often mentioned as a means of *motivational scaffolding* in writing center literature (Ryan and Zimmerelli, 2012; Mackiewicz and Thompson, 2013). For example, P5 mentioned listening to and reassuring students when they feel frustrated with reviewer comments or their relationship with advisors, while P7 deliberately tried to build emotional rapport to help students feel more comfortable during sessions.

This foundation of empathy naturally fed into confidence-building, where tutors used encouraging language and praise to help students recognize their own progresses. Five tutors used encouraging language and verbal compliments to affirm students' writing abilities. For example, P2 emphasized the importance of helping students recognize their own progress, creating an environment where student can believe that, *"Yes, [student] can be a writer;"* P5 described boosting students' confidence by reassuring them that their writing was already strong, particularly for those experiencing imposter syndrome or writing in a non-native language.

Preserving Students' Voices. Another crucial aspect of the writer-centered approach was preserving students' voices in writing. Six tutors emphasized the importance of maintaining students' original meaning and personal characteristics in their writing. As P2 noted, they prefer to *"keep them[students' writings] as a kind of personal characteristic."* P8 highlighted their training to ensure *"it's the students' ideas that we're working with"* rather than imposing their own thoughts. P3 also employed a strict rule in giving students no more than four continuous words to ensure this, because *"sometimes I say a sentence, and they[students] go: 'Oh, that's what I like.'"* This focus on preserving student voices and maintaining ownership aligns with many centers' minimalist, non-directive

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tutoring (Thompson and Mackiewicz, 2011).

Centering the Writer with AI. Five tutors brought up issues related to plagiarism raised by supervisors or students when discussing AI in tutoring contexts. Tutors argued that any AI writing support should prioritize student voices by adopting non-directive, minimalist feedback.

3.3   Writing Support is *Process-Oriented*

Using Examples and Analogies. Process-oriented writing support strategies emerged as a significant theme in our study. We identified three key strategies, with each being independently mentioned by eight tutors during our interviews. First, tutors emphasized the use of examples and analogies to facilitate student learning and comprehension. They provided a wide range of examples, from providing sentence structure options to sharing personal experiences for understanding writing contexts. They also used analogies to clarify complex concepts. For instance, P3 described using a simple topic–such as apples–to illustrate how to structure an introduction: *"If I was writing a paper on apples, I would start with a broader history of apples and how they fit into my thesis, and then gradually lead into the thesis itself."*

Providing Reader-Perspective. Second, eight tutors delivered feedback from a reader's perspective rather than a purely instructional standpoint. Instead of providing directive feedback as tutors, they shared their reactions and understanding of the text as readers, helping students recognize how their writing affects their audience. For example, P9 provided their perspective as a reader and asked clarifying questions accordingly by asking questions like, *"I also noticed [something] as I was reading...maybe you could expand here?"*

Understanding Prompts. Third, tutors ensured students thoroughly understood assignment prompts to maintain alignment with instructor expectations. Specifically, this involved having students explain prompts in their own words and collaboratively reading instructions to establish shared understanding. For instance, P6 emphasized checking for misalignment, noting that if students explained the instructions differently from how they initially interpreted them, they would *"literally point to parts of the instructions and say, 'When your instructor says to add more ethos to your paper, what does ethos mean?'"*

Orienting Process in AI. Organization and planning was the most highly regarded capability of AI

tools among tutors. Tutors shared their experiences using AI for organization, flow, generating ideas, and outlining. Three tutors reported using AI for these purposes in their own writing, while one tutor had experience using AI for writing tutoring. In total, six tutors perceived that AI could be effectively employed in writing tutoring for process-oriented tasks, making it the most highly perceived capability of AI.

3.4   Writing Support is *Collaborative*

Tutoring is Conversational. *"Sometimes they show the writing... I say, close your laptop for a second, and I close my laptop, too, and I say, like, talk to me,"* P6 said. Six tutors highlighted how conversation forms the foundation of collaborative writing support. Tutors actively created opportunities for dialogue rather than delivering one-way instruction. Some tutors, like P6 and P8, intentionally asked students to close their laptops to facilitate conversation, shifting focus from the written text to the verbal expression of ideas. Tutors also engaged in back-and-forth discussions instead of direct instruction about writing strategies and clarity, as noted by P4 and P9. Additionally, P7 emphasized that conversation is central to their tutoring philosophy, using dialogue as a primary tool for helping students develop their ideas.

Understanding Expectations. Rather than prescribing solutions, five tutors described a collaborative process of understanding writers' expectations. Tutors usually dedicated initial session time to mutual exploration of achievable goals for the session that are *"the most helpful to [the writer]"*, as P7 noted. This approach positioned writers as active participants rather than passive recipients of instruction, creating a shared understanding that guided their collaborative work rather than imposing a tutor-directed agenda. *"[The way] we're trained isn't necessarily like we're gonna go through and tell you everything,"* P9 emphasized.

Collaborative in AI System. While tutors did not specifically mention AI's capabilities in fostering a similar collaborative writing space, five tutors highlighted that they found AI tools often hard to comprehend writings. Unlike human tutors who facilitated back-and-forth conversations, AI systems seemed only capable of engaging in vague discussion. As P6 noted, *"ChatGPT sounds like the classmate who didn't do the reading, but still has to participate in class."*

INTERVIEW INSIGHTS

DESIGN GUIDELINES

Writer-centered

Empathy to Writers

Building Confidence

G1: The system should provide empathetic, responsive feedback that builds confidence through conversational check-ins, praise, and contextual reassurance.

Keep Writer's Personal Voice

G2: The system should provide non-directive feedback that helps writers refine their work

Process-Oriented

Examples and Analogies

Reader-Perspective

G3: The system should support writing process development by using examples, analogies, and reader-perspective feedback

Aligning with Writing Prompt

G4: The system should help writers understand writing prompt and goals

Collaborative

Conversing with Writers

G5: The system should provide dialogic feedback and actively encourage conversation grounded to writing

Meeting Writer Expectations

G6: The system should assess and respond to what the writer wants to work on
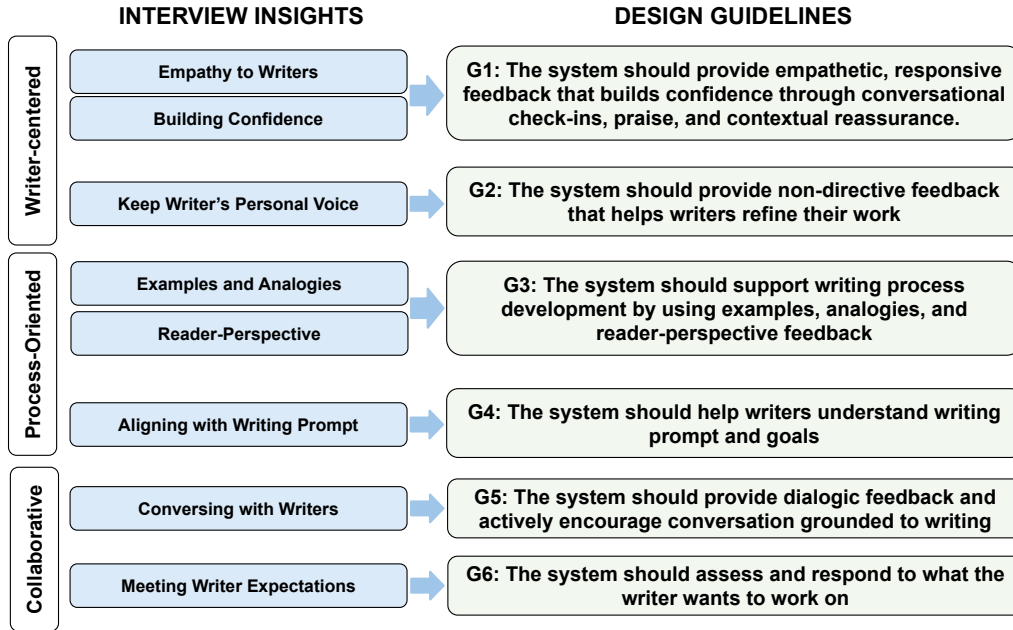
Figure 1: Interview insights and design principles categorized by writer-centered, process-oriented, and collaborative. Based on insights from formative interviews with writing tutors, we identified six core design principles.

3.5 Limitation

One limitation of this interview study is to only interview writing center tutors. We chose to interview tutors because they are trained practitioners who intentionally apply writing center principles in practice. Their perspective offers insights into the rationale behind specific strategies–how and why they implement them. Since our goal was to translate these principles into actionable AI design guidelines, understanding the intentional practices of tutors was critical. However, we acknowledge that students' perspectives are also crucial for understanding how these strategies are received and experienced. Future work should incorporate student voices to gain a more comprehensive view of effective writing support.

4 Design Goals

We translate tutoring practices from our interviews into actionable design goals for intelligent writing support systems, as shown in Fig.1. We unified guidelines around how we perceived these strategies interacting based on interviews with tutors and writing center literature. "Empathy to Writers" and "Building Confidence" were merged into G1, as both contribute to motivational scaffolding. "Examples and Analogies" and "Reader-Perspective" were combined into G3, as both are instructional strategies tutors used in sessions to support process-

oriented learning.

5 System Design

We illustrate how our design guidelines can inform the design of intelligent writing tools by developing *Writor*, an intelligent writing tool that aims to provide process-oriented, writer-centered, and collaborative writing support.

5.1 System Architecture & Workflow

Writor utilizes a client-server architecture with a Flask-based backend and a JavaScript frontend. The system operates in two key stages: (1) a preparation and goal-setting stage, where writers input context, upload texts, and define their writing objectives, and (2) an editing stage, where they receive and engage with AI-generated feedback. The backend integrates prompting to OpenAI's GPT-4o for writing analysis and Firebase Firestore to store session data and interaction history. All prompts for *Writor* are included in Appendix B.

5.2 Preparation & Goal Setting

Writor begins with a preparation and goal setting stage designed to help writers define their writing objectives. *Writor* prompts the writer to input their writing task details and specify areas they want to improve. Based on the writer's input, *Writor* generates a list of five suggested goals. One of

these generated goals focuses on the potential readers and their expectations, encouraging writers to consider their audience from the beginning. Writers can then select which of the generated goals to use and write in their own additional goals. By encouraging writers to discuss their goals for the writing session, their current assignment, and potential readers, *Writor* aims to address **G4** (Design Guideline 4) and **G6**. A writer's selected goals—along with the writing task details and a working draft of the text itself—are then sent to the backend for analysis. The prompts used for synthesizing goals are illustrated in Fig.3 in Appendix B.

5.3 Editing Stage

Following goal-setting, *Writor* enables writers to directly edit their text guided by feedback from the system. *Writor* automatically fills the writer's working draft (uploaded in the goal-setting stage, §5.2) to a text editor (Fig.2). Feedback based on the writers' selected goals are overlaid on the text as highlighted sentences (Fig.2c) with corresponding cards in the right sidebar (Fig.2e). If writers wish to remind themselves of their submitted goals, they can do so by expanding the goal panel in the upper left corner of the interface (Fig.2a). Below we describe the individual interface elements that support the editing stage.

5.3.1 Text Editor

The text editor on the left panel serves as the core space for writing and revising. It provides basic text formatting tools including bold, italic, and underline. The two key features in the editors are:

- **Interactive Highlighting (Fig.2c)**: Each suggestion or comment generated by *Writor* is linked directly to spans of the writer's text. These spans are shown as highlights within the text editor, color-coded to either praise or feedback (described in more detail in §5.3.2). When clicked, a highlighted span will scroll the associated feedback card into view. If the feedback card is clicked on the right sidebar, the associated highlight will be emphasized with greater highlight saturation.

- **Highlight & Get Feedback Button (Fig.2b)**: While *Writor* generates initial feedback when a writer begins the editing stage, the text interface also allows writer-initiated feedback. A writer can highlight any sentence within the text editor and request feedback from *Writor*

via an open-ended prompt. This function gives writers the flexibility to initiate feedback at any place in the text, addressing **G6**.

5.3.2 Feedback Sidebar

The primary interaction *Writor* provides is through a feedback sidebar (Fig.2e). The feedback sidebar presents praise for specific strengths within the document **(G1)** and areas for improvement. For each area of improvement, the generated feedback includes one or more non-directive strategy: asking questions **(G5)**, providing examples and analogies, or offering a reader perspective **(G3)**.

All pre-populated cards (for both praise and areas for improvement) are arranged in the order they appear in the text. Each card includes a header summarizing the feedback followed by generated feedback. Different background colors distinguish praise, problem areas, and self-highlighted cards, with praise cards featuring icons for additional emphasis. Background colors are coordinated with highlighted spans in the text editor.

Each card allows a writer to ask follow-up questions or engage in open-ended discussions **(G5)**, grounded to specific feedback. A *Find Example* button below the chat bar enables an additional strategy: finding examples within the writer's own text that might be a first step to addressing the current issue **(G3 & G5)**. When writers request examples via the Find Examples button, the system searches the document for successful implementations within the writer's own text addressing the identified critique. If no examples can be found, *Writor* provides analogies or examples on a different topic (e.g., P3's use of a basic topic like apples to illustrate a suggested revision).

All prompts for feedback include the writing task details, the writer's selected goals, and the writing itself (Appendix B). We limit initial feedback to five items and three praises in order to not overwhelm writers with long lists of generated feedback. The prompting strategy for areas of improvement follows the following pipeline and is shown in Appendix B, Fig.8:

1. HOC Identification: Identifies high-order concerns based on the writer's selected goals **(G6)**; if no HOCs are selected, infers HOCs automatically based on goals.

2. Sentence-Level Analysis: Maps identified HOCs to specific sentences, focusing on the most significant issues (limited to top 5).
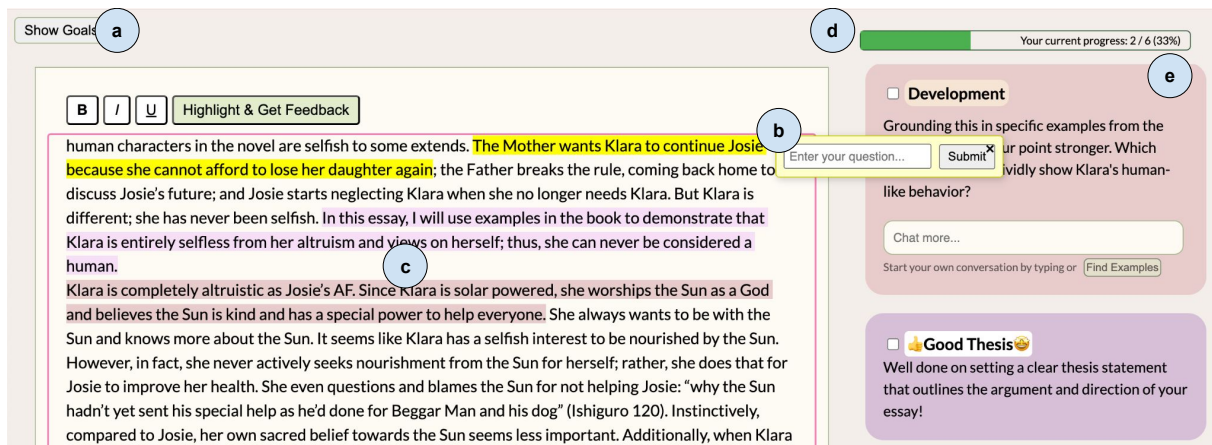
Figure 2: Edit Interface of *Writor*: (a) Expandable button for viewing selected writing goals; (b) Highlight & Get Feedback for user-initiated analysis; (c) Interactive highlighting that connects feedback to specific text; (d) Progress bar for tracking addressed feedback items; (e) Problem area feedback and praise cards.

3. Feedback Type Selection: Determines the most appropriate feedback approach (e.g., reader-perspective feedback) for each identified sentence.

4. Final Feedback Creation: Generates concise (under 600 characters) feedback using the feedback type paired with open-ended questions to promote writer engagement.

Writor is still a prototype, and we are currently planning additional refinements to the system. Among these refinements are import and export functionalities so writers can easily include *Writor* in their existing workflows. Text will be exported as plain text, while all *Writor* comments will be exported as an additional JSON with mapping to the original text. We also plan to further evaluate *Writor*'s generated output to ensure that suggestions are indeed specific to highlighted spans, suggestions consistently follow the feedback strategies we employ, and that the current prompts are robust to repeated requests for usable text.

6 Discussion & Future Work

In this workshop paper, we look to writing centers as one vision of writing technology that appropriately supports diverse student writing tasks. Our interviews with writing tutors (§3) and resulting design guidelines (Fig.1) illustrate ways that writing tools can support students in developing their writing by centering the student in a collaborative, dialogic process. Growing concerns about academic integrity (King and Chat-GPT, 2023) and over-reliance on text generation

(Zhou and Sterman, 2024) present an opportunity to re-imagine intelligent writing tools from content generators to process facilitators. Our prototype writing tool, *Writor*, illustrates one approach to this new paradigm, encouraging writers to engage with and refine their own writing rather than relying on AI-generated revisions. Below we discuss potential evaluations of *Writor* and further refinements that we are excited to pursue.

Proposed Evaluations We plan to evaluate *Writor* in a controlled experimental study comparing *Writor* with a chat interface. The study will be a counterbalanced within-subjects experiment comparing *Writor*'s writing feedback with a basic chat canvas interface. The basic chat interface will replicate open-ended chat interactions with a text editor (e.g., a chat sidebar with document and highlighted context). Participants will come in with two pieces of writing, one focused on argumentation (e.g., an argumentative essay) and one on professional communication (e.g., a cover letter). We selected argumentative essays and cover letters because these were the two most frequently mentioned and distinctly different genres discussed by tutors in our interviews. Each participant will use either the chat interface or *Writor* to revise each of their documents for 20-30 minutes. Following each revision, participants will complete a brief questionnaire about their experience with the tool and their overall perception of their final document and revision process. After using both tools, we will conduct semi-structured interviews to gather feedback about participants' interaction with both feedback approaches. We will compare editing

behavior, qualitative feedback on the writing experience, and final documents across the conditions. We also are brainstorming a more free-form deployment where students can use *Writor* in a classroom assignment and provide lightweight, in-situ signals on *Writor*'s feedback (e.g., thumbs-up) over the course of the writing assignment (e.g., 2-3 weeks).

We also plan to evaluate the model's suggestions in isolation with writing center tutors. In this study, tutors will rate AI-generated critiques and praises on argumentative essays and cover letters via surveys. Each writing sample will be paired with five critiques and five praises generated by the model. Tutors will rate each feedback item on dimensions such as accuracy, specificity, actionability, tone, overall quality, and adoption willingness. This evaluation complements the interactive user study by assessing how writing experts perceive the standalone quality of the model's feedback.

Fostering connections to writing centers   One risk of *Writor*'s (or similar tools') success is the diversion of interest from writing centers themselves. Writing centers provide more than non-directive, process-oriented feedback: they create social scaffolding for students and provide a first step for students accessing additional resources (Mackiewicz and Thompson, 2018; Thompson and Mackiewicz, 2011; North, 1984). Automated tools can bring significant benefits of scale, access, and personalization, but writing centers provide benefits inherent to the social context of interacting with other humans. Instead of seeing *Writor* as a threat to writing centers, we seek to provide a first step for students seeking support in their writing that works synergistically with writing centers. One way we are considering approaching this connection is by providing writing center tutors from our formative study with *Writor* and gathering their feedback on (1) how effective they perceive *Writor*'s support to be and (2) how they could see *Writor* integrating as a first (or later) step in their process working with students. Following our conversations with writing tutors, we are considering offering participants in our evaluation with the option of seeking writing support from local writing centers (with their permission) after interacting with *Writor*.

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A Interview Questions

Opening (5-8 min)

- Welcome and introduction.

- Brief overview of the research project and purpose of the interview.

- Present the consent form; assure confidentiality and explain that the interview will be recorded for research purposes; give time for the participants to ask questions about the consent form.

- Obtain consent.

Body (50 min)

Tutor Background (5 min)

- Can you tell me about your experience as a writing tutor?

- How long? Where? Which grade level?

- What kinds of articles and students do you mostly work with? At what stages of writing?

Tutoring Approaches and Strategies (15 min)

- **[Grounded to a scenario the tutor described earlier]** We want to focus on the editing stage, where students come in and present a draft. What kinds of strategies do you usually use?

- Can you give examples of non-directive tutoring strategies, such as scaffolding, that you use for advising on a draft? How effective do you find these? Do you think students find these approaches useful?

- How do you balance offering guidance while ensuring that students retain ownership of their writing?

- What kinds of questions or prompts do you find most effective for helping students think critically about their writing?

- If you find out that a student might be using a language model to write their script, what guidance do you think is most necessary to give them?

AI & Writing (24 min)

- Do you use AI during your sessions? If so, how?

- How do you feel about students' writing after ChatGPT and other large language models gained tremendous popularity? What are your opinions on these tools from a writing tutor's perspective?

- How might an AI writing support tool complement the work done in writing centers? Are you using any AI tools right now during your sessions?

- How could AI augment or help before, during, or after tutoring sessions with you?

- What opportunities do you see for expanding access to writing support through AI?

- How could an AI tool potentially address common issues you encounter in tutoring sessions?

Closing (6 min)

- Is there anything else you'd like to share about your experience as a tutor or your thoughts on integrating writing center strategies into AI systems?

- Do you have any concerns or suggestions for the direction of this research project?

- Based on your experience, what advice would you give to developers creating an AI writing support tool?

Conclusion (2 min)

- Thank the tutor for their time and insights.

- Explain the next steps in the research process, restating how the interview data will be used.

B Prompts

Prompt for Generating Goals

```
Here is the writing prompt and potential requirements:  '{writing_prompt}' Please analyze
what the expected goals are for the writing to fit the prompt and any grading rubrics or
requirements.  The user also has their expectations for the editing service, which are:
{edit_expectations}.  Given the information about the writing prompt and areas that users
want to work on, provide the top 4 goals that the user should aim for in their writing.  Goal
5 should be a goal aimed at satisfying any potential readers' expectations for the writing.
The writing type and potential readers are described here:  {reader}.  Be specific in your
goals, refrain from broad goals.  Return ONLY a JSON object with the following structure:

{
  "goals": [
    "Goal 1",
    "Goal 2",
    "Goal 3",
    "Goal 4",
    "Goal 5"
  ]
}
Replace the placeholder goals with the actual goals.  Do not include any extra text.
```

Figure 3: Prompt for Generating Goals

Prompt for Praise Feedback Generation

```
Please identify the sentences that the writer did well and provide encouraging feedback for
them.  Here is the complete writing:{text}.  The category should always include a praise word
like "Good Thesis", "Excellent Analysis".
Return your response in JSON form only for the top 3 most significant sentences, keep the
feedback under 300 characters, be concise yet constructive.

{
    "Encouragement": [
        {
            "Sentence": "To conclude, Klara can never be considered a human because she never
                        acknowledges herself.",
            "Feedback": "Great job on referring back to the thesis for conclusion!",
            "Category": "Great Conclusion"
        }
    ]
}
```

Figure 4: Prompt for Praise Feedback Generation

Context Prompt for Chats

```
Here is the entire writing for context:  {text}.  We are now conversing about the specific
sentence needing clarification or feedback, which is:  {sentence}.  You have previously
provided feedback on the sentence, which is {sentence_feedback}.  The conversation so far is:
{conversation}
Please try to answer the question and give feedback according to the context.
Follow these guildelines:  Do not directly provide the answer, but guide the writer toward
the answer.  Do not give any text to copy and paste directly into the writing.Instead,
provide examples or feedback to help the writer understand how to improve their writing.
If the user insists on a direct answer, respond with:  "I can't provide a direct answer."
Keep your response under 400 characters.
```

Figure 5: Context Prompt for Chats

Prompt for Self-Highlighted Feedback

```
User has a question about the selected sentence in the writing: {sentence} The question is:
{question}. Please provide a short, concise, emphatic, and encouraging feedback answering
the user's question and specific to the sentence. Here is the complete writing:{text} Keep
in mind these are the user's goals for the writing: {writer_goals_selected}. Keep the
feedback under 400 characters, be concise yet constructive. Return your response in JSON
form, **never** give users anything to copy and paste directly into their essay.

{
    "Feedback": "This is my empathic feedback."
}
```

Figure 6: Prompt for Self-Highlighted Feedback

Prompt for Finding Examples

```
We have identified a problem with the following sentence in the essay: {sentence} The
problem is: {problem} Now, here's the full essay for context: {essay}
Can you find examples from the essay where the writer has done well in addressing this kind
of problem? If so, please provide that example. If not, please provide an analogy or
example from a different context that could help the writer understand how to address this
problem.
Follow these guidelines: Provide **only one example**; Use second-person pronouns like "you".
Limit your response to 600 characters. Do **not** provide any text that can be directly
copied and pasted into the essay.

{
    "Feedback": "This is my empathic feedback with user's examplary quotes."
}
```

Figure 7: Prompt for Finding Examples

Prompt for Problem Area Feedback Generation

```
Step 1:  HOC Identification
```
Given the following writing, writing details, and writer's goals, identify up to 4 major high-order concerns (HOCs) that need urgent revision. Ensure these concerns align with the assignment goals or highlight major flaws not mentioned in the goals. High-order concerns include: Thesis/Argument: Whether the main argument is clear and well-structured; Organization: The logical flow and structure of ideas; Development: Whether evidence, examples, and reasoning support arguments.; Audience and Purpose: How well the writing communicates its purpose to the intended audience. Writing Details: {writing_detail} Writer's Goals: {writer_goals_selected} Writing: {text} Return response in JSON format:

```
    {"HOCs": [
        {"Issue": "Thesis", "Reason": "The thesis is vague and lacks specificity."},
    ]}
```

```
Step 2:  Sentence-Level Issue Identification
```
The writing focuses on the following issues: {hoc_results}. Identify the problematic sentences related to these issues. If a new sentence is needed, highlight the previous sentence where the new sentence should be inserted. Writing: {text}Return response in JSON format (top 5 most significant issues only):

```
    {"Sentences": [
        {
            "Sentence": "The central idea for the essay is on apple.",
            "HOC": "Thesis",
            "Reason": "The thesis is unclear and lacks specificity."
        }
    ]}
```

```
Step 3:  Feedback Type Selection
```
There are two types of feedback: Reader-Perspective Feedback: Describes how the sentence is perceived by the reader; Example/Analogy Feedback:Provides examples or analogies to clarify improvements. List of problematic sentences with reasons: {sentence_results} Writing: {text} Determine the most appropriate feedback type and return in JSON format:

```
    {"Feedback_type": [
        {
            "Sentence": "The central idea for the essay is on apple.",
            "HOC": "Thesis",
            "Reason": "The thesis is unclear and lacks specificity.",
            "FeedbackType": "Example/Analogy"
        }
    ]}
```

```
Step 4:  Final Feedback Creation
```
Provide feedback for the identified issues with an empathic and encouraging tone. Use the selected feedback type. Feedback Type List: {type_results} Writing Details: {writing_detail} Writer's Goals: {writer_goals_selected} Writing: {text}. Guidelines: 1) Keep feedback under 600 characters 2) End each feedback item with an open-ended question to promote engagement. 3) Do **not** provide text for users to copy and paste into their writing.

```
    {"Feedback": [
        {
            "Sentence": "The central idea for the essay is on apple.",
            "HOC": "Thesis",
            "Reason": "The thesis is unclear and lacks specificity.",
            "FeedbackType": "Example/Analogy",
            "Feedback": "A good thesis on pear is:[thesis]. Can you think about using similar strategy?"
        }
    ]}
```

Figure 8: Prompt for Problem Area Feedback Generation