

Designing Learning Companions for Enhancing Students' Writing Habits

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Abstract: This study confronts the issue of insufficient writing practice among elementary students, a concern prevalent in Taiwan. Despite the integral role of writing in learning, students frequently need more opportunities for consistent writing practice, affecting their reading and writing abilities. This research proposes a novel approach through an artificial intelligence-based "Writing Companion," designed to supplement the writing practice gap in current education. Three design mechanisms of the Writing Companion include facilitating autonomous writing opportunities, providing writing prompts, and aiding self-monitoring of the writing process. By encouraging consistent writing habits and promoting a balance of writing practice and strategy learning, this study aims to enhance students' writing literacy and motivation. The findings may provide critical insights into harnessing artificial intelligence to improve writing education.

Keywords: Writing Companion, Student Autonomy, Writing Habits

1. Introduction

Learning to write is one of the best ways to cultivate students' self-expression, and writing plays a crucial role in learning. Writing is a tool for students to gather and organize information, develop their knowledge, and use language to communicate.

Some studies (Cutler & Graham, 2008) have suggested reforms for primary school writing education: (a) increase students' writing time; (b) increase time for writing expository text; (c) provide a better balance between writing time, learning writing strategies, and teaching writing skills; (d) focus more on fostering students' writing motivation (Peng & Liu, 2020). Taiwanese researchers (Chen, Xie & Huang, 2007) also pointed out that to become an excellent writer, we must help students broaden and deepen their life and reading experiences. These experiences become long-term memories that are easy to retrieve and provide continuous and intensive writing experiences. Students need opportunities to discuss and share excellent works with their peers. In the long run, students cannot cultivate writing literacy through a small amount of writing practice. In other words, there is only good writing literacy with sufficient writing experience (i.e., sufficient writing volume). Continuous writing experience can help students form writing habits, establish interest, and acquire writing skills.

Therefore, this study attempts to develop an artificial intelligence-based learning companion, the "Writing Companion," to allow elementary students to practice writing autonomously with three mechanisms to build students' writing habits. This study aims to fill the gap in current school education that cannot arrange enough teaching for writing, leading to a general lack of writing practice among students (Fernsten & Reda, 2011), a lack of writing willingness, and a lack of opportunities to practice writing other types of text.

2. Building Students' Writing Habits: Three Design Mechanisms

2.1 Supporting Autonomous Writing Opportunities

"Writing Companion" provides a unique platform for fostering autonomous writing habits among students. Its 24/7 availability allows students to engage in writing exercises at their

convenience, thereby facilitating the development of regular writing habits outside the traditional time constraints of classroom instruction (Sun, 2010). "Writing Companion" encourages a personalized approach to writing practice by catering to individual learning needs. This targeted approach addresses specific learning needs and contributes to building consistent practice routines. For instance, if a student frequently struggles with grammatical errors, "Writing Companion" can suggest additional grammar exercises.

A distinct advantage of "Writing Companion" is its capability to provide real-time feedback. Unlike traditional writing exercises, where students often have to wait for the teacher's feedback, an immediate response from "Writing Companion" allows students to instantly recognize their areas of improvement. This prompt feedback mechanism can facilitate more active engagement in writing exercises, contributing to the establishment of regular writing routines. In summary, "Writing Companion" is a valuable tool for promoting regular writing habits among students. It enhances the writing learning process through immediate feedback and personalized practice, making it a beneficial resource for cultivating autonomous writing habits and improving writing skills.

2.2 Providing Prompts for Writing Practice

"Writing Companion" can be crucial in providing prompts for independent writing practice. Using natural language processing and machine learning technologies, "Writing Companion" can generate diverse writing prompts tailored to a student's current learning phase, personal interests, and areas of development (Proske, Narciss, & McNamara, 2012). This approach keeps students engaged and encourages them to integrate writing into their learning routine. This personalized interaction can help students develop the habit of structuring their narratives effectively. For example, if a student is learning narrative writing, "Writing Companion" might suggest prompts that guide the student to create a story with a clear beginning, middle, and end. Similarly, for an advanced student working on argumentative essays, "Writing Companion" can offer prompts that require crafting a persuasive argument on a complex topic. This regular practice can help the student establish a habit of building coherent and compelling arguments.

Beyond generating prompts, "Writing Companion" provides ongoing support throughout the writing process, making it a part of the student's habitual writing practice. If students struggle with developing a thesis statement, "Writing Companion" can offer constructive tips and examples. If a student faces difficulties structuring an argument, "Writing Companion" can ask guiding questions, making it a habit for the student to think in a structured manner while arguing a point. In summary, "Writing Companion" can be an intelligent and responsive partner, offering many writing prompts. By personalizing these prompts based on each student's unique learning journey, "Writing Companion" can significantly enhance the writing learning process. This approach can encourage students to adopt regular writing practice, thereby fostering effective writing habits.

2.3 Helping Students Monitor their Writing Process

"Writing Companion" is instrumental in fostering a regular writing habit among students. This tool allows students to manage their writing practice, creating a continuous record of their progress that can be revisited for reflection and further learning (Xiang, 2004). For instance, "Writing Companion" can store and display a history of a student's writing submissions and the provided feedback. Reviewing their past work and comparing it with their current efforts can encourage students to maintain a consistent writing practice. Self-monitoring and reflection are essential for developing metacognitive skills crucial for effective learning. Moreover, "Writing Companion" can provide real-time analytics, offering students insight into their writing practice. These could highlight the frequency of writing exercises, recurring grammatical errors, or areas of improvement over time. Such immediate and personalized feedback can inspire students to stick to a regular writing schedule by demonstrating their progress and making their learning goals more attainable.

"Writing Companion" can also facilitate the setting and tracking personalized goals, motivating students to maintain a habitual writing practice. For instance, a student might aim to decrease the frequency of a specific grammatical mistake or increase the complexity of their sentence structures. "Writing Companion" can monitor the student's progress towards these goals, providing regular updates and encouragement, thereby establishing a routine of goal-oriented writing.

In summary, "Writing Companion" equips students with a powerful tool for fostering a regular writing habit, promoting self-reflection, goal setting, and a deeper understanding of their learning process. This innovative approach holds promise in supporting independent writing practice and enhancing writing skills.

3. Upcoming Work

This study engages approximately 60 third and fourth-grade primary school students in an experimental evaluation lasting at least one semester to cultivate robust writing habits. Initial data collection includes the assessment of student's current writing habits, interests, and skills, which inform the development of tailored writing activities. Students interact with the "Writing Companion" system during allocated writing sessions. This platform guides students through various writing tasks, assisting in goal setting, task selection, and execution via interactive dialogue. Post-session, students can evaluate their progress by reviewing their personal knowledge graph and writing trajectory within the system, updating their writing goals, and consulting the Writing Companion for different writing tasks. Post-semester data collection measures the evolution of students' writing habits. Concurrently, the system's backend is monitored to capture changes in students' writing behaviors over the semester. Thus, this study aims to foster sustainable student writing habits through consistent engagement with the Writing Companion system.

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