Improving Student Writing Performance: Understanding the Value and Use of the WriQ Score

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1.0 Introduction

1.1 The Importance of Writing

The ability to write clearly and effectively is considered to be one of the most important outcomes of education.[1] Writing is recognized as a complex cognitive function that involves integrating many skills and processes. Significant improvement in writing ability occurs because of frequent opportunities to write, feedback, and sustained engagement in the revision process. In many respects, writing is a craft where skills are learned, practiced, and refined over time.

1.2 Learning to Write and Writing to Learn

The focus of K-3 instruction in writing involves helping students learn to master the conventions of writing. As a result, the curriculum focuses on teaching handwriting, spelling, capitalization, grammar, sentence structure, and basic story formats. In many lower elementary classrooms, writing is routinely linked to reading through a variety of literacy development activities.

A recent meta-analysis found a medium effect size (ES = 0.57) on writing performance when writing was paired with reading interventions.[2] This symbiotic relationship can be explained by the fact that readers use domain knowledge to understand what they are reading while writers draw on this same fund for ideas as they write. Similarly, reading contributes to understanding meta-knowledge about written language and writers apply their knowledge of text features, words, syntax, and usage. Teaching reading and writing together has demonstrated medium effects on specific measures of writing quality (ES = 0.63), number of words written (ES = 0.37), and spelling (ES = 0.56). As a result, an emphasis on reading and writing in the elementary grades should be considered a best practice that facilitates skill development in both subjects.

Writing is recognized as a complex cognitive function that involves integrating many skills and processes.[3] When process-writing models are used in the elementary grades, students are explicitly taught about each of the five phases (idea generation, drafting, revising, editing, and publishing) of the model along with explicit strategies

for completing the key tasks within each phase. Students benefit from process writing instruction when their teachers use consistent language and strategies as they guide students through writing assignments; yet there is no single pathway for all students to learn how to write.

The emphasis of writing instruction changes considerably in grade 4 and beyond, That is, teachers use writing as a means for developing deep learning about subject matter. As the grade levels increase, teachers tend to provide less direct instruction about writing processes. Rather, they focus on disciplinary literacy that involves using specialized vocabulary and new forms or genres (e.g., science lab report, historical biography, persuasive essays). There is considerable research evidence demonstrating the value of writing in the content areas. A recent meta-analysis,[4] found moderate effective sizes of 0.30 for science, 0.33 for social studies, and 0.32 for mathematics for enhancing learning outcomes. These outcomes are even more significant when considering the low cost of the intervention, that is, helping teachers structure meaningful writing opportunities.[5]

1.3 Trends and Issues in K-12 Writing

A number of issues impact the nature of writing instruction in K-12 schools. First, in many schools, writing is not a priority because writing is not assessed in high-stakes assessment; only 25% of students in middle school and high school write for at least 30 minutes a day.[6] This is woefully inadequate for meeting the recommended practice of writing for 30 minutes a day in Kindergarten and 60 minutes a day in grades 1-12.[7]

Second, despite the value of writing for improving disciplinary learning outcomes, students don't write across the curriculum.[6] Writing in most schools is relegated to English Language Arts (ELA) classes.

Third, curricular changes as a result of initiatives like the Common Core State Standards (CCSS) have altered the emphasis in student writing. In schools that have adopted CCSS, students will spend less time writing narrative, imaginative, or topics of personal interest, and more time on argumentative and informative writing.[8] These priorities have been justified as a function of ensuring that students are college and career ready but are not always aligned with teachers' views about writing instruction.

Finally, many indicators reveal that current policies, practices, and assessments are failing to help students achieve the writing proficiencies needed to be successful in academic and workplace environments.[9] Evidence from the National Assessment of Education Progress indicates that only 24% of American eighth and twelfth grade students are proficient in writing.[10] Overall, student writing achievement has remained flat over the past two decades.[11] The most recent annual report from ACT regarding the college and career readiness status of high school seniors indicates that only 59% of students have achieved the ACT College Readiness Benchmarks required to have a reasonable chance of success in first-year credit-bearing courses at a typical postsecondary institution.[12]

2.0 Writing Assessment Using WriQ

2.1 WriQ Student Experience

WriQ is designed to provide students in grades 1-12 with formative feedback about their writing. During the writing process, students can use the Read&Write toolbar to check grammar and spelling, have words read aloud, and more. All of these functions support students' executive functioning, self-regulation, and metacognitive development, critical characteristics in the development of writing competence.[13] Writing in the cloud affords students the opportunity to write individually or collaboratively, on any mobile or desktop device (i.e., phone, tablet, computer), from any location.

The student version of WriQ has three state-of-the-art research-based features that enhance student motivation, engagement, and success in writing. First, WriQ provides students with a data panel so that they can monitor their writing performance in real-time and compare their performance over the past week, month, or year. Research has demonstrated that feedback is one of the most important factors for enhancing student achievement.[14] No other writing tool on the market has

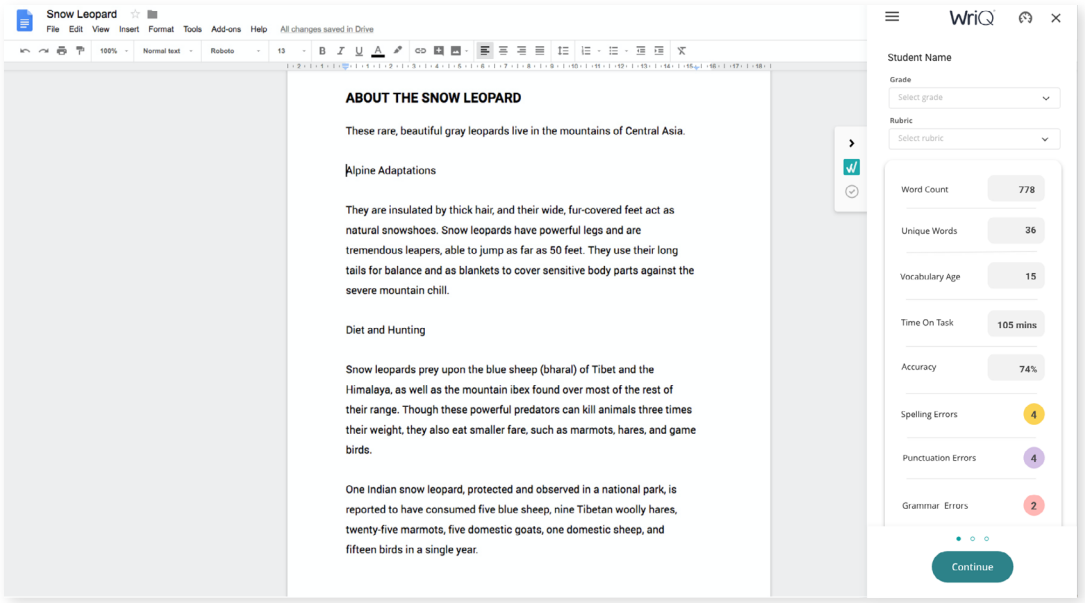
such powerful performance analytics for student writers.

Second, WriQ computes a performance analytic known as a Burst. Researchers have defined a writing burst as a period of writing activity between two 2 seconds or longer consecutive pauses in which at least one word was written; burst length is the number of words written in the given burst.[15] Shorter bursts reflect cognitive dissonance associated with the lack of a complete thought or a spelling or grammar challenge that interrupts composition flow. Longer bursts indicate the composition of a sustained thought. Helping students understand their ability to generate longer bursts contributes to their cognitive development as a writer. Similar to how a fitness tracker uses number of steps as a metric for challenging users to increase their fitness, the WriQMeter provides visual analytics to engage the student writer in improving their burst performance personal best. WriQ is the only tool in the marketplace that utilizes the research on writing bursts as a metric for improving the deep learning cognitive functions associated with writing development.

Finally, writers develop their knowledge and skills through sustained engagement in writing. Writing more, and more frequently, are the single-most important interventions for improving student writing abilities.[16] WriQ recognizes and celebrates student writing achievements by awarding badges for specific milestones (e.g., writing 5 days in a row, writing 10,000 total words). Digital badges are recognized as a powerful motivational tool and their application within WriQ directly addresses research recommendations that call for more attention to the use of technology to enhance writing motivation.[17]

2.2 WriQ Teacher Experience

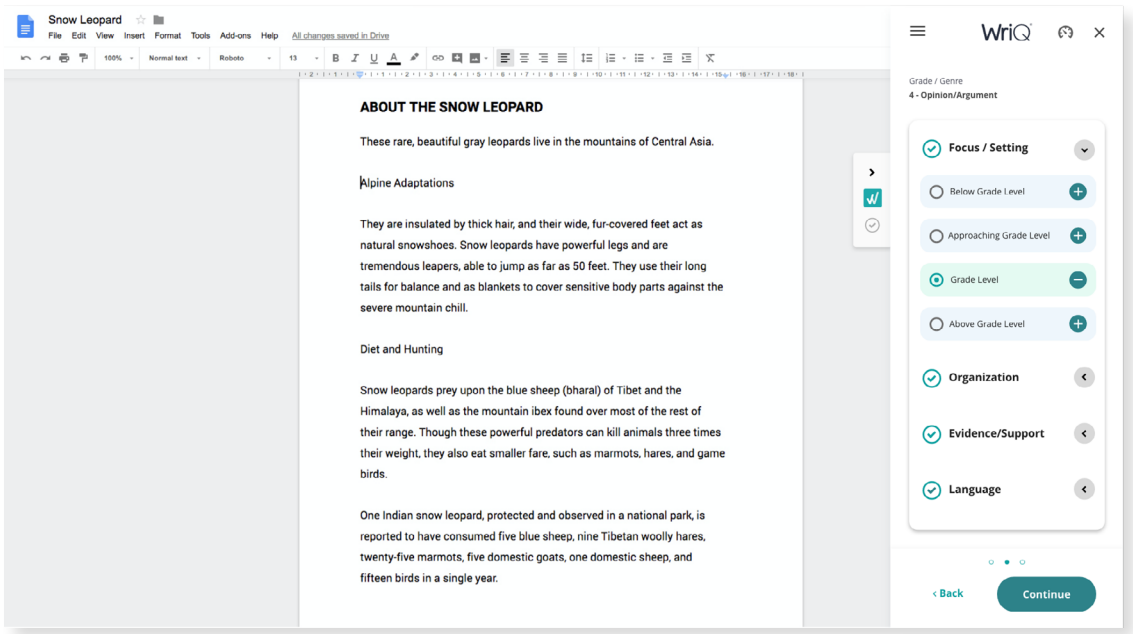
Student writing is managed within the G-Suite and Office 365 systems. These cloud-based productivity systems offer seamless access to documents by both student and the teacher. When teachers are ready to evaluate a student's writing, they sign-in, open the desired document, and click on the WriQ extension. Teachers indicate the student's grade level and the writing assignment genre when they open the student document.



The first teacher data panel provides a quantitative analysis of student writing based on metrics such as word count, sentence count, words per sentence, vocabulary maturity, correct word sequences, incorrect word sequences, and total time spent writing. Grammar, spelling, and punctuation errors are highlighted in-context in different colors. Data are presented in a colorful visualization for teachers to review prior to qualitatively scoring the document for the quality of the content. The writing mechanics are automatically and quantitatively evaluated. This form of automated grading is an important application of technology to free educators from the tedious mark-up of mechanics in student writing and allows them to focus on issues of writing quality that cannot be properly evaluated by automated grading systems.[18] WriQ calculates a number of variables found in the research literature known to be effective in discerning differences in writing proficiency, such as correct word sequence (CWS), sentence length, and vocabulary maturity.[19] An algorithm based on these metrics calculates a WriQ Score for each writing sample to reveal the student's writing proficiency. The WriQ Score can range from 0 to 400 and is designed to be

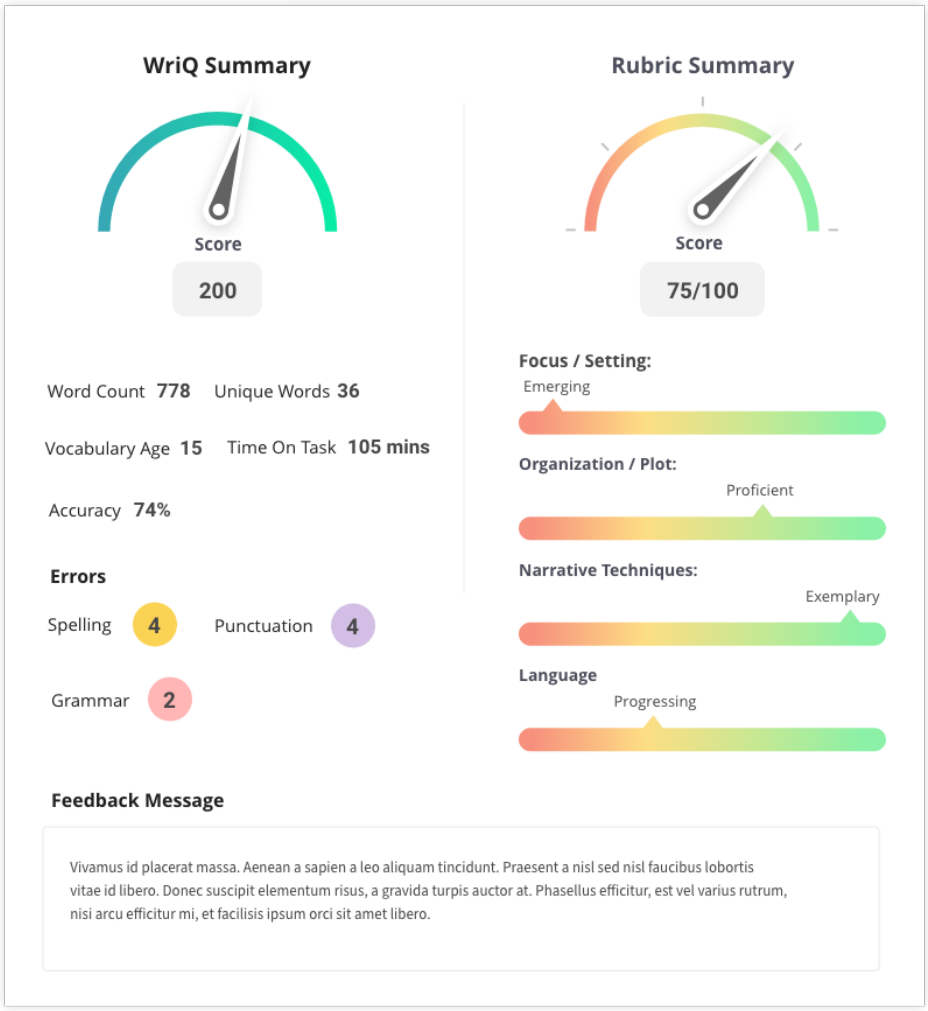
a robust standardized measure of a student's longitudinal development as a writer to allow educators to make comparisons about student writing within and across writing genres and school years.

Whereas automated metrics are easy to calculate, researchers have noted that quality writing is much more than mechanical accuracy.[20] To address this deficiency in existing automated essay grading systems, WriQ has a feature that allows teachers to quickly, easily, and consistently score student papers using a rubric. Following the review of the writing mechanics, the teacher is provided the opportunity to qualitatively evaluate the writing using rubrics that are aligned with national grade level writing standards, or, their own district writing standards (a feature in the premium version). In the second teacher dashboard, the appropriate rubric is presented relative to four components and teachers are presented with a list of characteristics that reflect performance at four levels: below grade level, almost grade level, at grade level, and above grade level. The teacher evaluates the writing against standardized performance expectations by providing a simple checkmark in the appropriate box. This process offers a significant reduction in teacher time needed to evaluate a student's paper thereby addressing a major impediment to writing improvement.[21]



2.3 WriQ Feedback to Students

Following the completion of the rubric scoring, teachers are presented with a summative assessment of the student's writing and given the opportunity to provide additional narrative feedback to the student. The feedback summary will automatically be embedded at the top of the student's paper. After pressing the Confirm button, the WriQ dashboard is added to the top of the student's paper. When students open their paper, they see a visual report that provides the summative evaluation of their writing performance in a visual format that facilitates easy and accurate interpretations of strengths and areas that need additional attention.



2.4 WriQ Dashboards

WriQ performance data is available for the student, teacher, and administrator. Each dashboard is customized to provide relevant feedback.

In the student version of WriQ, if the extension is installed, performance data summarizes the amount of time spent writing, number of words generated, a word cloud that illustrates the most frequently used words and infers the subject domain, and the current length of their writing bursts. In addition, they can review any feedback provided by the teacher as well as view their achievements they have attained. Individually, and collectively, the features in the student dashboard are designed to provide students with information that motivates and reinforces their interest in writing.

The teacher dashboard provides teachers with an automated analysis of the student writing relative to research-based characteristics of the writing sample, such as number of words, correct word sequences, vocabulary maturity, and more.
In the premium version, educators are also able to compare student performance over time to provide a visual representation of the student's writing journey in order to provide individualized feedback about the student's writing strengths and areas that need improvement within their current grade and writing genre, or across multiple school years.

When school districts upgrade to the premium version of WriQ, administrators have access to a dashboard that provides dynamic comparisons of writing performance within and between schools. These data can inform insights about district writing curricula, amount of time students spend writing, and areas in need of improvement.

2.5 What Makes WriQ Uniquely Powerful?

The WriQ Score is designed to measure growth in writing performance over time. The psychometric properties of the WriQ Score minimize the ceiling effect often experienced by high-performing students that prevents the reliable measurement of growth over time. However, educators and parents will need to understand that a WriQ Score is not a percentile but a metric that is highly sensitive to the complexity of a writing sample. The value of the WriQ Score is not the score on a single paper but the patterns that are revealed when examining student writing performance over time.

Independent research on the efficacy of WriQ is on-going. However, several preliminary discoveries concerning the value and use of WriQ have been documented:

• Automated metrics such as correct word sequence, mean sentence length, and vocabulary maturity have shown strong predictive analytical value for differentiating student writing quality by grade level.

• Standardized rubrics improve the reliability and validity of teacher evaluation of student writing across students, classrooms, and schools.

• The technology infrastructure of Google Classroom, Google Docs, Office 365 and WriQ provide a comprehensive suite of tools to support diverse student writers to routinely engage in writing.

• WriQ provides teachers with unprecedented power to evaluate student writing both qualitatively and quantitatively, build standardized individual data-based profiles of student writing performance and growth over time, and develop intervention plans for struggling writers.

WriQ has a clear desirability for students as it provides real-time feedback about their writing performance before their work is submitted. WriQ promises to reduce the time educators spend grading student writing assignments. And, WriQ holds significant promise for school districts interested in measuring and evaluating student writing performance across grade levels.

For more information about WriQ, visit: **text.help/WriQscore**

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