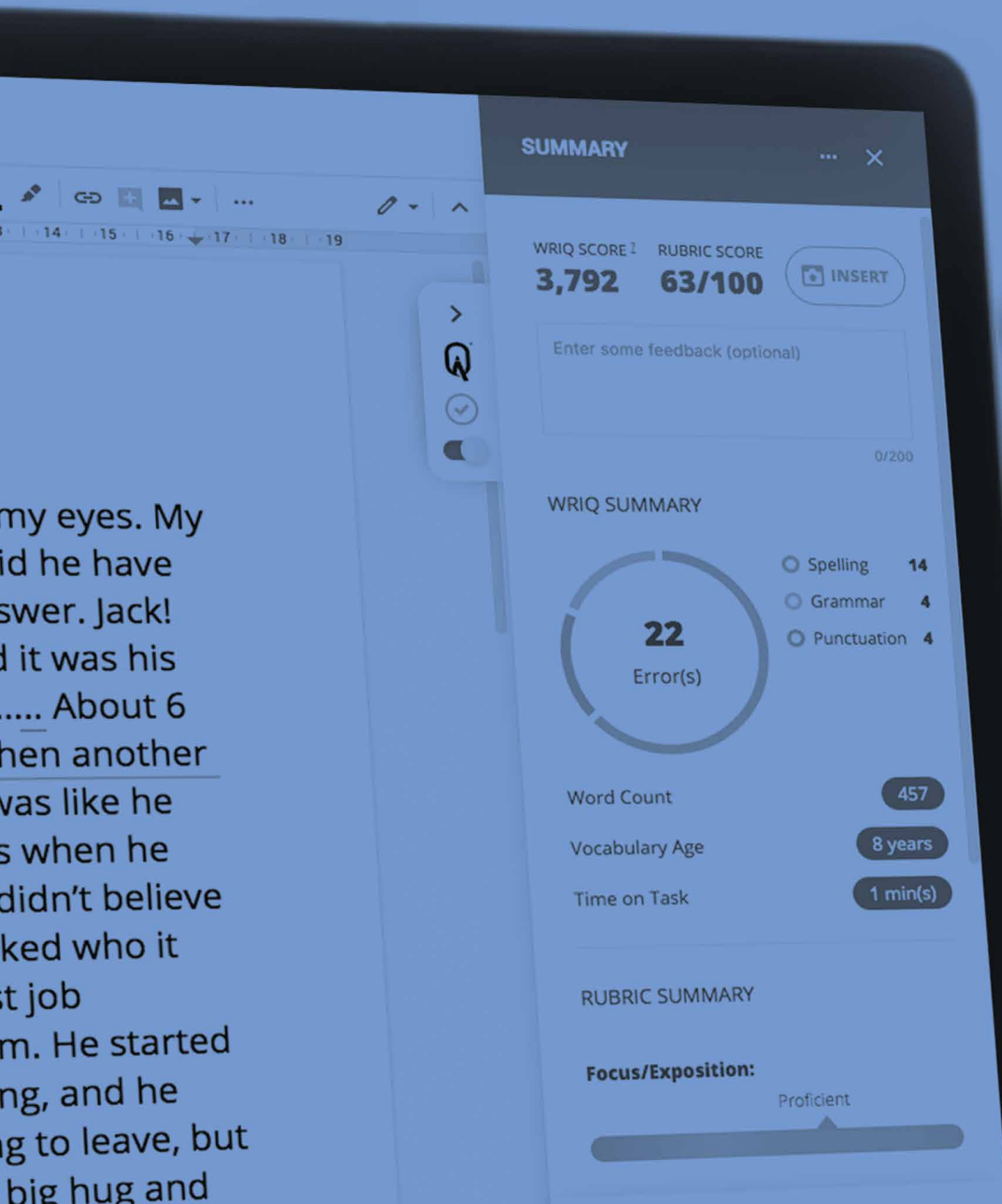


# Improving Student Writing Performance: Understanding the Value and Use of the WriQ Score

Written by **Dave Edyburn**

Professor and Associate Dean for Research and faculty development at the College of Community Innovation and Education, University of Central Florida

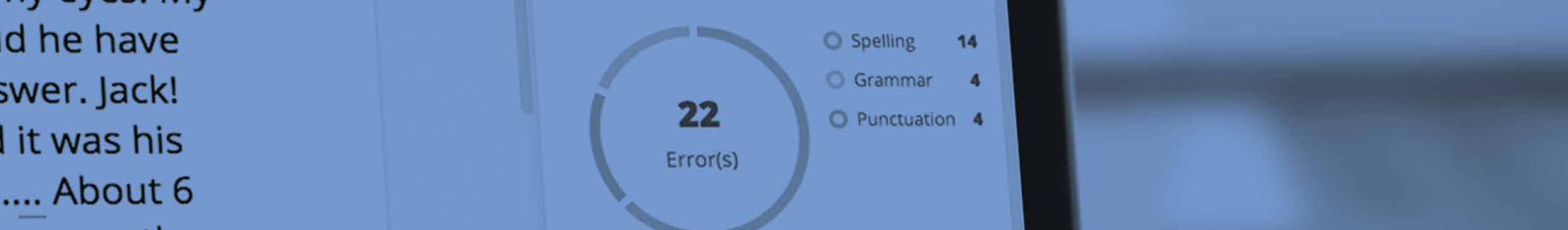


...y by ...  
d he have  
swer. Jack!  
l it was his  
.... About 6



# Contents

<b>1.0 Introduction</b>	<b>3</b>
1.1 Why is Writing Important?	3
1.2 Challenges Impacting Student Writing Proficiency	3
1.3 Opportunities for Innovation	3
1.4 Metrics of Writing Assessment	4
<b>2.0 Writing Assessment Using WriQ</b>	<b>5</b>
2.1 WriQ	5
2.2 WriQ Quantitative Data Analytics	6
2.3 WriQ Qualitative Data Analytics	7
2.4 WriQ Feedback to Students	8
2.5 What Makes WriQ Uniquely Powerful?	9
<b>References</b>	<b>10</b>



# 1.0 Introduction

## 1.1 Why is Writing Important?

Writing is a complex cognitive ability that is foundational to the development of communication and thinking skills. Writing instruction helps students learn to write for different audiences and purposes, including: writing to persuade, writing to explain, and writing to convey real or imagined experience. The importance of helping students learn to write clearly, effectively, and efficiently is an educational outcome that cannot be underestimated (Graham & Harris, 2019; Olson, 1996).

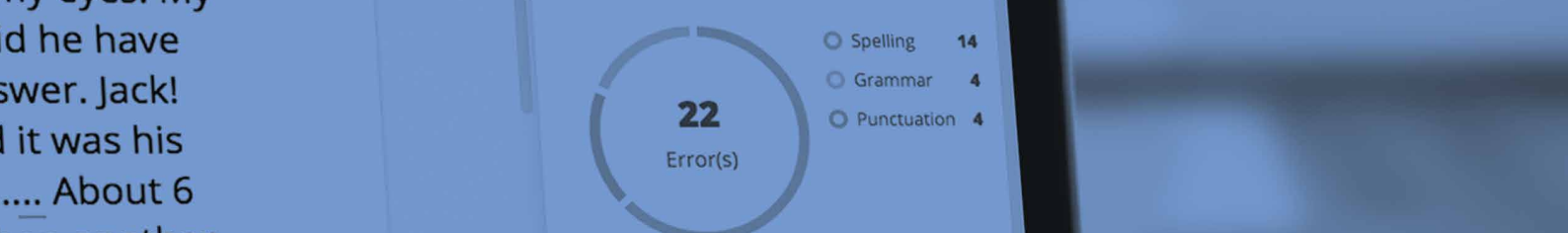
## 1.2 Challenges Impacting Student Writing Proficiency

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 (Troia, et al., 2018). Recent data from the National Assessment of Education Progress (NAEP), and many state-level assessments, reveals that students' writing proficiency has remained flat over the past two decades (Condon, 2013; Doorey & Polikoff, 2016). Presently, only 24% of American eighth and twelfth grade students are proficient in writing (National Center for Education Statistics, 2012) – a poor outcome for educational systems that seek to graduate students who are college and career ready.

Most middle and high school teachers have student loads of 90-150 students per day, which create disincentives for frequent graded writing assignments. As a result, existing time and workload constraints prevent students from writing routinely or obtaining sufficient practice and feedback on their writing to develop proficiency (College Board, 2003; Gates Foundation, 2019).

## 1.3 Opportunities for Innovation

Many educators and administrators recognize the potential value of technology for improving students' writing performance. However, the application of technology in support of student writing varies greatly between schools and school districts. Yet isolated examples of technological innovations can be found in some classrooms:



- cloud-based writing platforms allow students to write collaboratively,
- spelling and grammar checkers identify potential errors and offer corrective feedback,
- text analysis tools offer statistical evidence about the complexity of the text, and
- automated essay scoring systems purport to offer a comprehensive measure of writing quality.

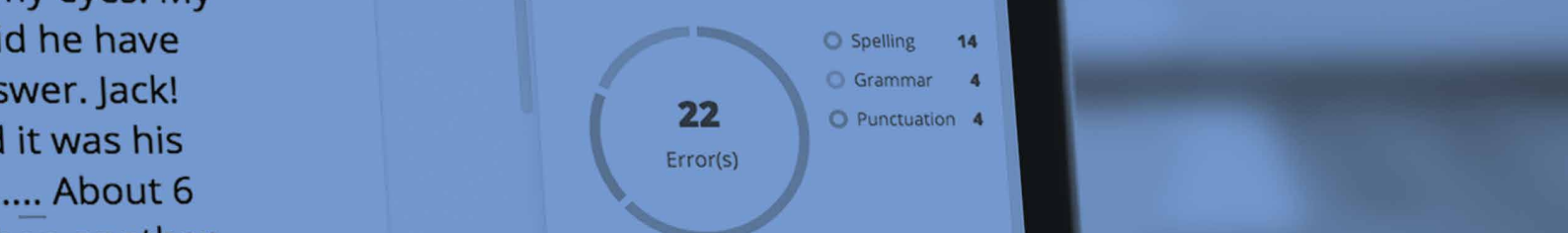
The chief value of these innovations is that they give student writers just-in-time (formative) feedback while also reducing the grading burden on teachers (Deane, 2013, 2014). Until recently, little attention has focused on bringing these innovations to scale, in a cohesive suite of tools, at a price point that a majority of schools can afford.

### **1.4 Metrics of Writing Assessment**

Over the past decade, efforts to use technology to assess student writing has primarily focused on scoring the final product. However, when students write within cloud-based writing environments such as Google Docs, it is now possible to use new real-time metrics to evaluate their writing performance. When evaluating a student's writing sample, and comparing the metrics of their writing to other students in their cohort group, it can be helpful to evaluate:

- Productivity – The writing output. That is, how many words did the student actually write?
- Accuracy - The mechanical and grammatical accuracy. That is, how many correct word sequences did the student create?
- Fluency - The fluency or pace and accuracy of composition. That is, how many words per minute, and more specifically how many correct word sequences per minute did the student produce?
- Word Choice – The word choices used by the writer. That is, is the student writing with a vocabulary maturity consistent with their age/grade?

Productivity and accuracy have been shown to be useful, valid, and reliable measures and have been widely adopted as the Correct Words Sequence (CWS) / Incorrect Word Sequence (ICWS) measure of writing (McMaster & Espin, 2007). However, the calculation of CWS and ICWS scores by teachers has been deemed too



tedious of a manual process as to have practical use in schools. Teachers simply do not have time.

Writing fluency, and text maturity, or Word Choice, have also been established as valuable measures of writing proficiency (Graham & Harris, 2019). Until recently there has not been a means of accurately assessing how long a student spends writing a passage, and the automated assessment of text maturity was not widely available. Technological advances have made it possible to:

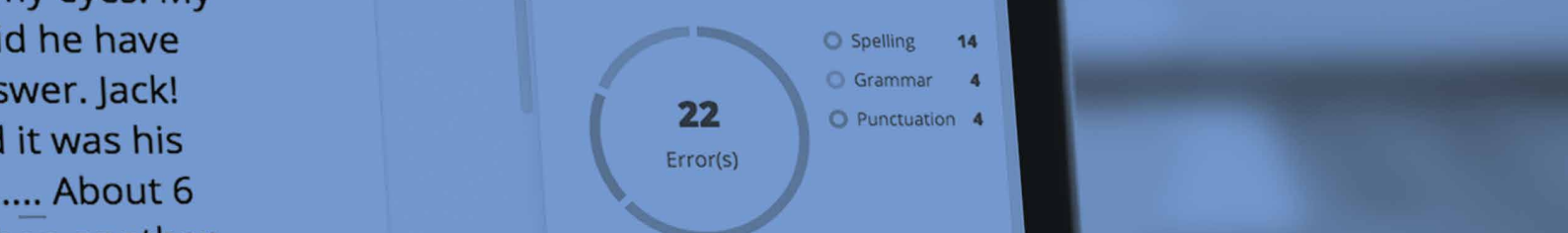
- Automatically calculate the CWS and ICWS measures. This greatly simplifies the assessment of Productivity and Accuracy.
- Automatically track the time spent writing in Google Docs and Microsoft Word, the tools most widely used for student writing, providing a measure of writing Fluency.
- Automatically index the words used by a student to provide an assessment of the maturity of their writing by understanding the sophistication of their Word Choice.

## 2.0 Writing Assessment Using WriQ

### 2.1 WriQ

WriQ is a writing assessment tool developed by Texthelp and released in May 2016. It is designed to work as a Chrome Extension in conjunction with Google Docs and Google Classroom to assist teachers in evaluating the quality of student writing in grades 1-12.

During the writing process within the Google Doc environment, 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 (Santelmann, Stevens, & Martin, 2018). Writing in the Google cloud affords students the opportunity to write individually or collaboratively, on any mobile or desktop device (i.e., phone, tablet, computer), from any location.



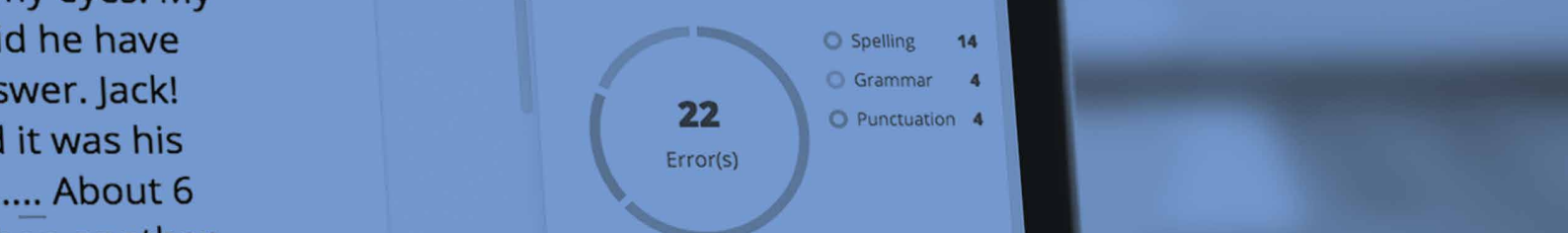
Student writing is managed within the Google Classroom system. The system offers seamless access to documents by both student and the teacher. Learning how to collaboratively function within a digital workflow system is considered to be an essential skill for the 21st century workplace and classroom (Nacu, Martin, & Pinkard, 2018).

When teachers are ready to evaluate a student's writing, they sign into the Google Classroom, open the desired document, and click on the WriQ extension. The writing sample is automatically and quantitatively evaluated. Then, the teacher is provided the opportunity to qualitatively evaluate the writing using rubrics that are aligned with national grade level writing standards. Finally, the teacher is able to review the summary feedback that will automatically be embedded at the top of the student's paper and add any additional comments. As of Fall 2018, over 47,000 student papers have been evaluated by teachers using WriQ thereby creating one of the largest corpuses in the world of student writing samples.

## 2.2 WriQ Quantitative Data Analytics

Whereas educators may be familiar with Lexiles in reading (a standardized system of assessing text complexity), there is no such standardized system for evaluating student writing on a developmental scale to demonstrate students' writing proficiency and growth over time. WriQ seeks to fill this void by providing a WriQ score that uses an algorithm to calculate student writing proficiency (some variables are captured in real-time while others are captured and calculated at specified intervals), including:

- Writing Speed in Words per Minute (WPM)
- Correct Writing Speed (WCPM)
- Sentence Length
- Text Maturity
- Spelling Accuracy
- Punctuation Correctness
- Grammar Correctness
- Correct Word Sequences (CWS)
- Incorrect Word Sequences (ICWS)



The screenshot displays a writing sample titled "Dream or Reality" with the following text: "Jack is gone my dad said as tears filled my eyes. My own brother, it had to be him? Why? Why did he have to go? I asked my dad that, their was no answer. Jack! He had to leave. Jack come back to me. And it was his 21st birthday too. Let me tell you the story..... About 6 hours ago there was a knock on the door then another then another. Jack answered it. "Hello?" it was like he knew they were coming. I asked who it was when he got done talking, he said it was a friend. I didn't believe him though. When he got to his room, I asked who it was again. This time he said it was the best job application ever! That time i did believe him. He started packing up. I asked him where he was going, and he said to mexico! I was sad that he was going to leave, but it was his job, so i let him go. I gave him a big hug and we said our goodbyes before he would call me when he got to the airport. I told him to have safe travels and to".

The analytics sidebar on the right provides the following data:

Metric	Value
Grade	Grade 8
Genre	Narrative
Accuracy	95%
Spelling	14
Grammar	4
Punctuation	4
Word Count	457
Vocabulary Age	8 years

A "CONTINUE TO RUBRIC" button is visible at the bottom of the sidebar.

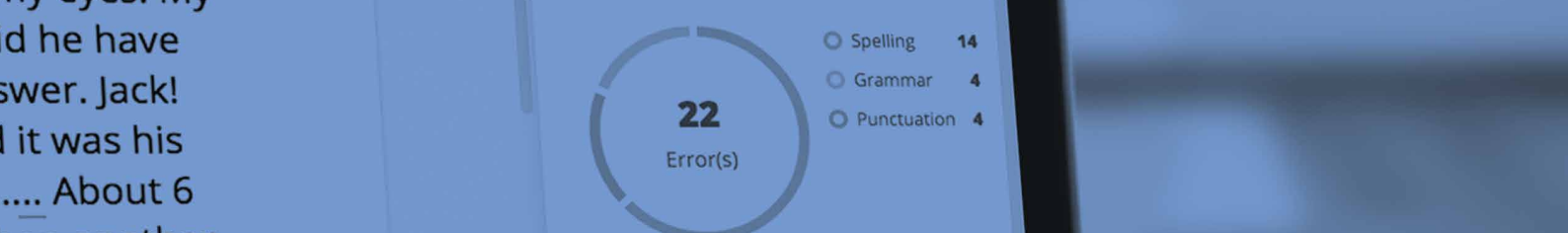
The first teacher dashboard provides a quantitative analysis of student writing based on metrics such as word count, sentence count, words per sentence, vocabulary maturity, correct word sequences, incorrect word sequences, and total time spent writing. Grammar, spelling, and punctuation errors are highlighted in-context in different colors. Data is presented in a colorful visualization for teachers to review prior to qualitatively scoring the document for the quality of the content.

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 (Wang & Brown, 2007). These variables are consistent with scoring metrics found in similar products such as Coh-Metrix, e-rater, and Kaggle.

### 2.3 WriQ Qualitative Data Analytics

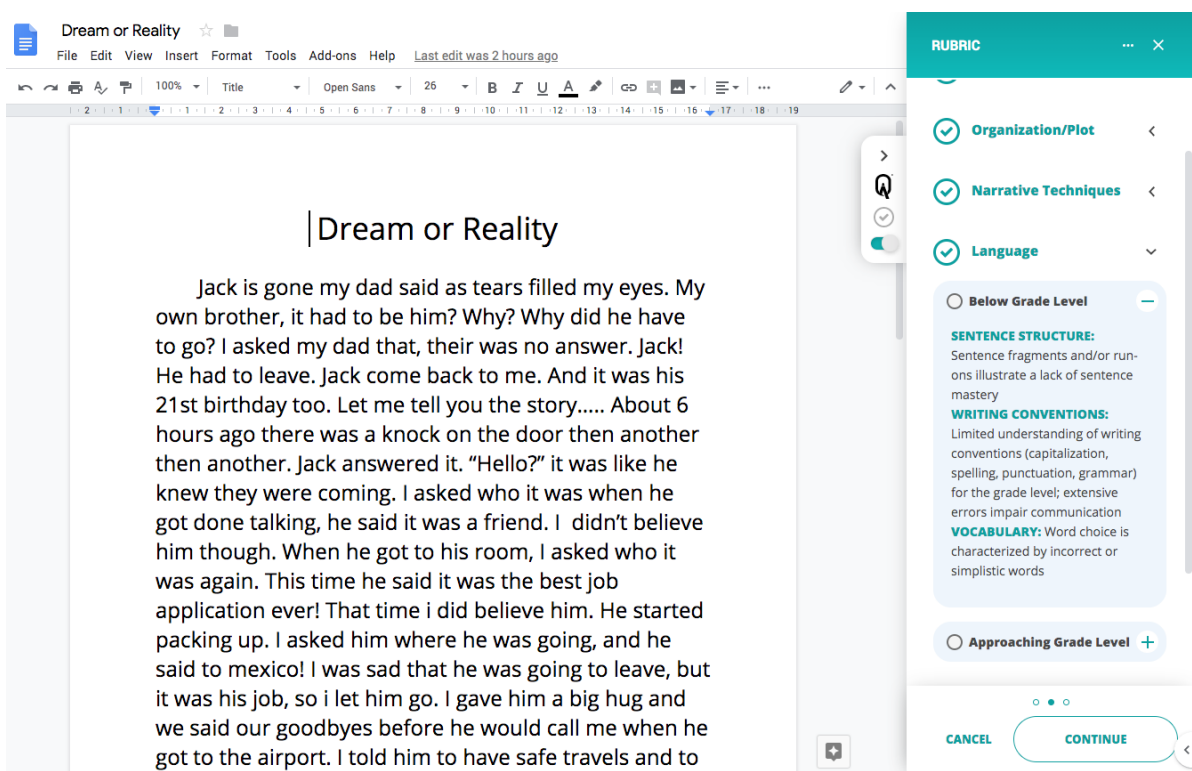
Whereas automated metrics are easy to calculate, researchers have noted that quality writing is much more than mechanical accuracy (Condon, 2013; Elliot & Williamson, 2013). To address this deficiency in existing automated essay grading systems, WriQ has a feature that allows teachers to quickly, easily, and consistently





score student papers using rubrics that were developed in alignment with national standards for writing proficiency.

Teachers indicate the student's grade level and the writing assignment genre when they open the student document. In the second teacher dashboard, the appropriate rubric is then 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.

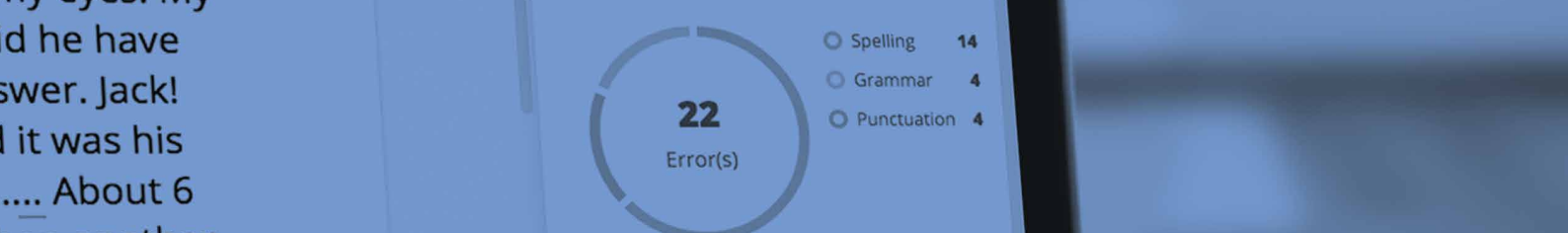


The teacher evaluates the writing against standardize performance expectations by providing a simple check in the appropriate box. This process offers a significant reduction in teacher time needed to evaluate a student's paper thereby addressing a major impediment to writing improvement (Dean, 2014).

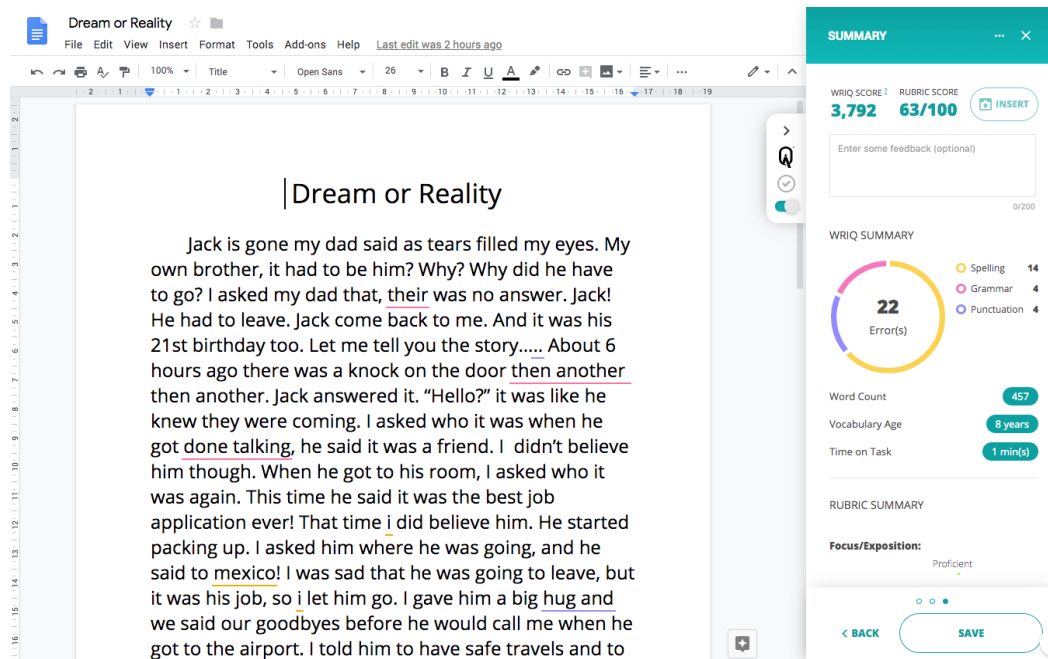
## 2.4 WriQ Feedback to Students

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 narrative feedback to the student. After pressing the Confirm button, the WriQ dashboard is added to the top of the student's paper. When students open





their paper in Google Docs, 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.



## 2.5 What Makes WriQ Uniquely Powerful?

Independent research on the efficacy of WriQ is on-going. However, at this point the following discoveries have been documented concerning the value and use of WriQ:

- 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, and WriQ provide a comprehensive suite of tools to support diverse student writers routine engagement in writing.
- WriQ provides teacher with unprecedented power to evaluate student writing both qualitatively and quantitatively and build standardized individual data-based profiles of student writing performance and growth over time.

d he have  
swer. Jack!  
l it was his  
.... About 6



## References

College Entrance Examination Board. (2003). *The neglected "R": The need for a writing revolution. Report on the National Commission on Writing in America's Schools and College*. New York: Author.

Condon, W. (2013). *Large-scale assessment, locally-developed measures, and automated scoring of essays: Fishing for red herrings? Assessing Writing, 18*, 100-108.

Dean, P. (2014). *Using writing process and product features to assess writing quality and explore how those features relate to other literature tasks*. Princeton, NJ: Educational Testing System.

Deane, P. (2013). *On the relation between automated essay scoring and modern views of the writing construct. Assessing Writing, 18*, 7-24.

Doorey, N., & Polikoff, M. (2016). *Evaluating the content and quality of next generation assessments*. Washington, D.C.: Thomas B. Fordham Institute.

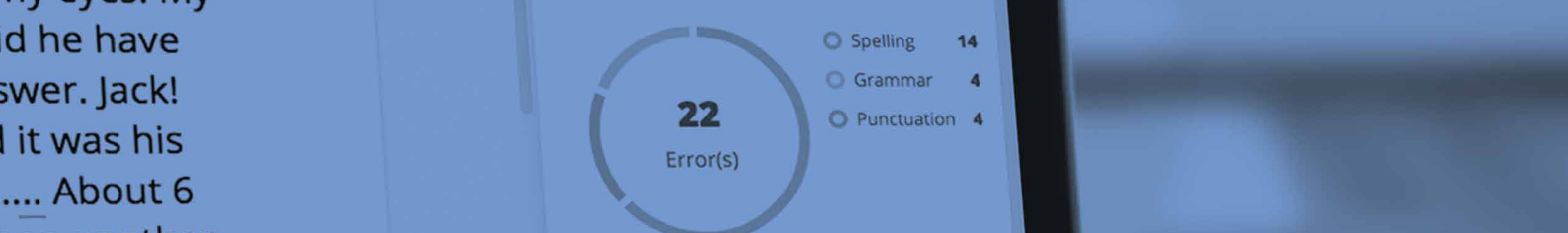
Elliot, N., & Williamson, D.M. (2013). *Assessing writing special issue: Assessing writing with automated scoring systems. Assessing Writing, 18*, 1-6.

Gates Foundation; & Chan Zuckerberg Initiative. (2019). Education research and development: Learning from the field. Available from: <http://k12education.gatesfoundation.org/researchanddevelopment/>

Graham, S., & Harris, K. R. (2019). Evidence-based practices in writing. In S. Graham, C.A. MacArthur, & M. Hebert (Eds.), *Best Practices in Writing Instruction*, (pp. 3-28). NY: Guilford Press.

McMaster, K., & Espin, C. (2007). *Technical features of curriculum-based measurement in writing: A literature review. The Journal of Special Education, 41*(2), 68-84.

Nacu, D., Martin, C. K., & Pinkard, N. (2018). *Designing for 21st century learning online: a heuristic method to enable educator learning support roles. Educational Technology Research and Development, 66*(4), 1029-1049.



Nagin, C. (2012). *Because writing matters: Improving student writing in our schools*. NY: John Wiley & Sons.

National Center for Education Statistics. (2012). *The Nation's Report Card: Writing 2011* (NCES 2012-470). Washington, D.C.: Institute of Education Sciences, U.S. Department of Education.

Olson, D. R. (1996). *The world on paper: The conceptual and cognitive implications of writing and reading*. Cambridge University Press.

Santelmann, L. M., Stevens, D. D., & Martin, S. B. (2018). Fostering master's students' metacognition and self-regulation practices for research writing. *College Teaching*, <https://doi.org/10.1080/87567555.2018.1446898>

Troia, G. A., Olinghouse, N. G., Zhang, M., Wilson, J., Stewart, K. A., Mo, Y., & Hawkins, L. (2018). Content and alignment of state writing standards and assessments as predictors of student writing achievement: An analysis of 2007 National Assessment of Educational Progress data. *Reading and Writing*, *31*(4), 835-864.

Wang, J., & Brown, M. S. (2007). Automated essay scoring versus human scoring: A comparative study. *Journal of Technology, Learning and Assessment*, *6*(2), 4-28.

For more information about WriQ, visit: [text.help/WriQChrome](https://text.help/WriQChrome)