Alberta Journal of Educational Research, Vol. 65.1, Spring 2019, 72-93

Beyond Presentation Effects: Understanding the Role of Handwriting in the Holistic Rating of Young Students' Writing in Grade 4

Hetty Roessingh, David Nordstokke, Mitch Colp

University of Calgary

The goal of this study is to glean research insights into the role of handwriting on the holistic rating of young students' expository writing samples in Grade 4. We focus on the interaction of compositional fluency—the total number of words (TNW) generated, the quality of the handwriting, the style of handwriting, and the holistic rating of writing outcomes on an expository prompt. We observed a relationship between fluency, quality of handwriting, and holistic rating of the writing samples, suggesting the need for sustained instructional attention to handwriting to achieve academic literacy in Grade 4. More than merely "looking pretty on the page," the quality of the handwriting is reflective of the neuro-motor control required to develop fluency or productivity for the academic requirements of upper elementary writing tasks. Samples of Grade 4 handwriting are provided to illustrate and support the quantitative findings of this inquiry.

L'objectif de cette étude est d'obtenir un aperçu du rôle de l'écriture dans l'évaluation globale de récits par de jeunes élèves en 4e année. Nous nous penchons sur la fluidité du texte—le nombre total de mots rédigés, la qualité de l'écriture, le style de l'écriture et l'évaluation globale du récit sur un sujet donné. Nous avons noté un lien entre la fluidité, la qualité de l'écriture et l'évaluation globale des récits, ce qui suggère le besoin d'une attention pédagogique soutenue à l'écriture, de sorte à ce que les élèves atteignent une littératie académique en 4e année. La valeur d'une belle écriture dépasse le sens esthétique: la qualité de l'écriture reflète la régulation neuromotrice nécessaire au développement de la fluidité et au rendement qu'exigent les travaux de rédaction dans les années scolaires subséquentes. Des échantillons de rédactions par les élèves en 4e année viennent illustrer et appuyer nos résultats quantitatifs.

Producing quality written text is a complex endeavor that involves mobilizing an array of neuro-motor, psycholinguistic, and metacognitive resources related to transcription and text generation skills, all within working memory. There are many competing demands on young learners' cognitive capacity; thus, "offloading" the lower level transcription skills of printing and spelling by automatizing them would afford access to other resources required in the writing process.

Grade 4 is a pivotal point in the development of written literacy learning. Students may be assumed to have the transcription skills of printing and spelling under sufficient control

(Graham, Berninger, Abbott, Abbott, & Whitaker, 1997; McCutchen, 1996) to unlock scarce cognitive resources to engage with the demands of academic tasks associated with curriculum in upper elementary grades. Young students are expected to produce not only more, but better quality writing as reflected increasingly through precise and nuanced vocabulary choices aligned with genre requirements of expository prose. Generating quality text is conceptualized as a process that involves planning, organizing, making vocabulary choices, editing, and revising (Berninger, 1999).

Early and transitional academic literacy outcomes in the K-6 years continue to decline and are a cause of concern across Canada and internationally (Applebee & Langer, 2006, 2012; Cutler & Graham, 2008). In their meta-analytic review of handwriting studies, Feng, Lindner, Xuejun, and Joshi (2017) reported a large amount of research evidence citing handwriting difficulties ranging from 5 to 44% among young learners; these were associated with quality writing outcomes that are on a stubborn and steady downward cline.

This goal of this inquiry is to glean refined research insights into the role of printing or handwriting—henceforth used interchangeably—on the holistic quality writing outcomes on student writing in response to an expository prompt (see Appendix A). The data consist of 245 samples of writing from 11 Grade 4 classes.

Our work is both pragmatic and practical: we extend the scholarly work in this area by focusing on the work of classroom practitioners and aim to provide rubrics, exemplars, and guidelines that elementary generalist teachers might use in their instructional planning with a view of improving children's early and academic written literacy outcomes.

The broad questions that frame this inquiry may be stated as follows:

1. How important is the quality of handwriting in the holistic evaluation of Grade 4 writing?
2. Does the quality of handwriting and quantity of words on the page—our proxy for handwriting fluency—predict the holistic rating of the writing samples? These are scored on a four-point scale (1: Limited, 2: Adequate, 3: Proficient, and 4: Excellent).

We begin with providing background information on generation iGen—those born between 1995 and 2012, the smartphone generation (Twenge, 2017). Their time coincides with what is also recognized as 21st century learning, the ubiquity of digital devices and social media. And further, their time coincides with the downward trend in literacy engagement and achievement outcomes in the analog world.

We then review the literature in the domain of written literacy; specifically, the importance of handwriting and fluency, developmental milestones and key features of Grade 4 written literacy, and assessment considerations including quality of handwriting and measures of compositional fluency that account for both speed/productivity and endurance (speed over time). In this connection, we address the topic of keyboarding in the early years, and the debate surrounding instruction in cursive handwriting traditionally introduced in the Grade 3 year (Boyd, 1970). We then describe the design of the study and report the findings. Finally, we discuss the implications of the findings for classroom pedagogy in handwriting with the specific goal of increasing fluency, and we make suggestions that will be relevant to the contemporary classroom context in Grades 3-4.

iGen

Twenge (2017) has developed a large program of research focused on *iGen*—a term she coined to

describe those born between 1995-2012. They are the first to live entirely in the era of the smart phone and the accelerated use of social media. This coincides with the construct of 21st century literacies, conceptualized to include multi-literacies both in digital and legacy/analog formats in real life (IRL).

iGens are constrained by both time and attention. The chronemic displacement by digital media—the extraordinary amount of time children, beginning at a young age, allocate to the attraction and gratifications afforded by on-demand devices—comes at a cost that researchers are only beginning to understand. Shortage of outdoor play, sleep time, social interactions, and literacy engagements in the analog world (Twenge, 2017) cumulatively may all contribute to the complex web of underlying causes in the uptick reflected in the data of children's lack of readiness for the exigencies of their early schooling experiences (Janus & Reid-Westoby, 2016), including the crucial fine motor skills that are involved in learning to print. This stretches across socio-economic status. The "catch up" or remedial effort required upon entry to school is not easy: the distal consequences are apparent even several years later (Roessingh & Bence, 2016).

Today's young students may also be spending increased commute time to school. Significant numbers of students in large urban boards, including the site for our present study, ride "yellow buses" to an array of alternative programs, or, in the case of new housing developments, to distant schools with space available until a local school is constructed. This warehousing of young students further infringes on their waking hours, and in turn, the possibilities for play, reading, and engaged talk with parents and extended family—their first teachers.

Finally, the teaching of handwriting in the curriculum has been contested for many years. Salient to the present inquiry is the ongoing debate surrounding the teaching of cursive hand: when and if so, what style of connected script will permit students to transition from manuscripts that will promote speed/fluency of hand? And secondly, as highlighted above, the perception that 21st century literacy skills, namely keyboarding, should be prioritized over cursive script. The controversy pertains to when keyboarding should be introduced and whether it can simply replace handwriting—too often dismissed as a quaint, outmoded, irrelevant skill for iGens (Prensky, 2005). We address these questions in the literature review that follows.

Literature Review

There is an extensive body of research on the development and the role of handwriting emanating from developmental psychology as well as the cognitive and neurosciences (see especially Berninger, 1999; Graham, 2009; Medwell &Wray, 2014). We draw specifically on two areas: the research that focuses on the importance of both quality and fluency of handwriting which are developmental milestones and key features of Grade 4 written literacy (Stevensen & Just, 2014), and assessment considerations including quality of handwriting and quantity—measures of compositional fluency that encompass speed/productivity and endurance (speed over time).

The Importance of Handwriting

Traditionally, neat printing was valued in early written literacy learning for its own sake, as well as its potential to influence subjective evaluation of student work even into post-secondary settings. Graham and associates (1997) as well as Peverly (2006) reported marker bias in students' composition outcomes due to the appearance of the handwriting of the author,

described as the *presentation effect*.

Explicit instruction especially in cursive script has been marginalized on the curriculum for decades (Graham & Weintraub, 1996; Korbey, 2013; van de Geyn, 2013). Crowded, cluttered curriculum with so many demands on teachers' time is cited as a key reason for the diminished time for teaching handwriting and its consequent removal from the Common Core in the United States (Heitin, 2016). Lack of teacher understanding and confidence in teaching printing and handwriting (Graham, 2009), general lack of research evidence on the importance of handwriting, and as noted earlier, the prominence of digital devices that require keyboarding may all have been contributing factors.

Well-designed, current studies that can weigh in on the question of handwriting versus keyboarding or both are sparse, especially in classroom contexts. Steven and Just (2014), occupational therapists by profession, provided an excellent and accessible account of the crucial role of kinesthesia/muscle memory in connection to letter shape recognition that underpins early reading development, and hence, the writing-reading linkage that is promoted by printing and printing practice. Keyboarding activates different centers in the brain and recruits different muscle movements than handwriting that young learners are not able to master until their upper elementary years. They may be expected to develop fluency in keyboarding around Grade 6. There is a latency period, then, of approximately two years during which it would be important for young students to have fluency in handwriting to attend to the demands of academic engagements in upper elementary school. As mentioned previously, these accelerate in the Grade 4 year. Students are increasingly expected to be able to take notes and summarize information they have read from various sources, for example. Further, other benefits accrue to those who are adept in handwriting. Peverly (2006) reported that students with more fluent handwriting take better notes and are later better able to retrieve information from these notes in examination contexts.

These findings chime with MacKenzie's (2016) thoughts on handwriting and keyboarding—she advocated for both.

Handwriting is making a gradual comeback both in Canada and the US (see for example, Prince Edward Island, 2012). A growing body of research evolving from the neurosciences underscores the importance of this shift on the curriculum that goes beyond the presentation effects. Transcription skills are increasingly understood as complex, crucial contributors to cognitive engagement in the writing process (Bounds, 2010) and in turn, to achievement and academic success over the entire educational trajectory including into post-secondary settings and adult written literacy demands at home and in the workplace (Christensen, 2009; Peverly, 2006).

Written literacy development is a gradual, protracted process somewhat akin to a juggling act wherein a delicate, shifting balance unfolds between the lower level transcription skills of printing and spelling and the text generation demands of composing. Handwriting continues to account for a sizable amount of the variability—42% (Graham, 2009) in the quality of children's writing outcomes, finally maturing around Grade 9 (Graham, Berninger, Weintraub, & Shafer, 1998; Kent & Wanzek, 2016; Pontart, Bidet-Ildei, Lambert, Morisset, Flouret, & Alamargot, 2013). Automaticity and speed of handwriting are key to fluency of the hand. This increases year by year though in an uneven, non-linear fashion. Wojtalewicz (2016) reported by the end of Grade 4, an enormous range in the number of words generated in students' writing samples: from 29 to 626 words with a mean of 185 words. Longer writing samples were associated with better writing quality outcomes. A one-way ANOVA revealed significant differences in the mean

total number of words by proficiency standard, $F(3, 255) = 95.58$, $p < .001$, $\eta p2 = .529$. Tukey post-hoc comparisons revealed that all group differences were statistically significant at the .05 probability value. As mentioned previously, we adopt the total number of words (TNW) as a proxy for compositional fluency.

Researchers address the question of whether handwriting should comprise manuscript or cursive style, and if cursive is to be taught, when (Graham, 2009; Morin, LaVoie, & Montesinos, 2012)? Traditionally, children in Grade 3 would make this transition (Boyd, 1970), often to a looped D'Nealian style; however, contemporary thought on this topic encourages the idea of simplicity and individual preference: legibility and speed are the critical criteria (Graham, Berninger, & Weintraub, 1998; Korbey, 2013). This is readily accomplished with what is described as an "mmm" style (mixed mostly manuscript): a clean, uncluttered, Italic script that involves connections between letters such as "th" and "fi" that facilitate the development of a fluent hand. In any case, over time writers tend to develop a style of handwriting that works for them and that may be influenced by musculature structure and grip.

Milestones in written literacy development and the grade 4 year. In the early schooling years, the major task facing young learners is to gain sufficient control over orthographic coding and the neuro-motor demands of printing and spelling to convey their thoughts through words, to print on the page. By the end of Grade 1, 95% of children who have participated in an instructed, explicit printing program produce legible printing (Roberts, Derkach-Ferguson, Siever, & Rose, 2014), visible in simple compositions of 50-75 words on a familiar topic such as a favorite pet or toy, with 75-85% spelling accuracy (Gentry, 1982). The writing is described as *knowledge telling* and is characterized by short, simple sentences that have the feel to the reader of having been "pushed out," one idea at a time—such are the constraints of what a young author can "hold onto to" in working memory while attending to the demands of handwriting. All children are overwhelmingly dependent on the first 500-word families of English in making the phonics connections and conventions involved in orthographic coding, in the reciprocal demands of reading ↔ writing.

By the end of Grade 2, clear patterns in young students' written literacy outcomes start to emerge, distinguishing better writers from those who may be at risk in the future. All students appear to make gains in spelling accuracy and the vast majority of young learners who have received direct instruction in printing produce at least legible script and make progress in generating more words on the page (Roessingh, 2013). Outcomes in compositional fluency (i.e. TNW) reflect a greater range that increases again in the Grade 3 year. Longer compositions are evaluated as better-quality compositions: the use of cohesive devices in particular afford opportunities for the writer to elaborate (*and, but, because*), and provide examples and explanations (*so that …*). Further, better writers are mobilizing increased variability in vocabulary choices reflected in precision of meaning and nuance in addition to access to low frequency vocabulary.

The Grade 4 year represents a major shift in the early to academic literacy demands associated with curriculum and expository modes of writing. In the reading literature, the Grade 4 year is identified as the pivotal point from learning to read to reading to learn. Failure to make this transition has been associated with low vocabulary thresholds for shifting from the decoding skills to comprehension of increasingly complex informational texts and has been coined "the Grade 4 slump" (Chall & Jacobs, 2003; Sanacore & Palumbo, 2008). Written production, as previously noted, makes additional demands of young students, however, Grade 4 is identified as a point where the resource demands of transcribing decrease to a manageable

level. If automaticity in handwriting is not under sufficient control to unlock lexical and other cognitive resources, the trade-off may be seen in both the quantity and quality of the writing sample (Graham, 2009; Jones & Christensen, 1999, McCutchen, 1996). Consequently, the discrepancy between reading scores and writing scores among young learners with strong vocabulary knowledge becomes increasingly visible (Yates, Berninger, & Abbott, 1995; Roessingh & Bence, 2017).

The present inquiry seeks to glean insights into the continued role that handwriting might contribute to both quantity and quality of students' compositions.

Assessment Considerations

Research on the assessment of handwriting is sparse: much is focused on clinical populations for diagnosing and remediating poor handwriting using measures that are at some remove from the classroom. Typical tasks include one to two-minute timed tests of letter copying, dictation, or open-ended compositions but again, of short duration—perhaps 5 to 10 minutes (Graham, 2009). Speed is reported in letters per minute, a measure (on a task) that is generally not meaningful to classroom teachers (e.g. The quick brown fox jumped over the lazy dog).

There is general consensus in the research that legible printing is dependent on producing script that is uniform and consistent in shape (form), size, space, slant, or slope (Alston, 1985; Anderson, 1969; Graham et. al, 1998; Graham, 2009; Medwell & Wray, 2014). Holistic and analytic approaches for assessing printing are available; however, for classroom purposes a holistic framework that is simple and quick to implement is needed. The research reports that inter-rater reliability for assessing legibility of children's printing is strong when teachers have been trained with samples of the sought-after standard and the criteria (Rosenblum, Weiss, & Parush, 2003). Interestingly, Boekaerts, Nieuwenhuizen, and Seegers (1992) have found that once young learners have internalized stable mental models of letters from direct instruction, practice and explicit feedback on features such as shape, size, and slant, they are themselves proficient at assessing their own productive efforts as early as Grade 3. Accordingly, Alston's (1985) rubric was adapted by the first author for the purposes of a large research project involving students' writing samples over time that includes the present investigation. Figure 1 illustrates the rubric.

Quality of handwriting	**Shape**	**Size**	**Spacing**	**Slant**
Labored: difficult to decipher/read. Clear signs of poor fine motor control				
Legible: readable with effort. Sufficient f-m control.				
Controlled: uniform, consistent (**4S**) traits				
Fluent/ "in flow": sense of automaticity/ "push behind the pencil": speed+accuracy+endurance				

Figure 1. Trait-Based Rubric for Evaluating Handwriting Adapted from Alston, 1985.

As researchers, we want to work collaboratively with our partnering school boards and teachers in using assessment data that can inform and in turn, transform classroom practices (Nelson & Van Meter, 2007). The key is to work in ways that make data meaningful and usable for planning purposes in the classroom as well as for teacher professional development. The protocols and prompts for collecting the writing samples and marking them involve the teachers, have been field-tested and are administered in the context of authentic, routine classroom work. The aim is to engage students in interesting work that is cognizant of the ecology and the organic nature of the teaching and learning processes that produce students' best independent written efforts. We invite the students to reflect on their writing and provide their ideas about what they did well, what they found challenging and what they would do if they had more time.

Study Design

In this section we describe the research site and the participants to give the reader context information for this work. We elaborate on the writing task—the prompt, the protocol for its administration, and the rubrics designed to score and analyze the writing samples. Following that we consider the limitations of this study. Finally, the findings are reported for the factors related to early written literacy under study related to our over-arching question.

Context of the Study

The study was conducted in a single, publicly funded (K-12) school district within a large, urban center. This is a school of choice, and most children are bused to their school location. There are eight campuses across the city that attract diverse learner demographics; however, the students are overall typical learners and none are coded for special needs or funding. This school district has a distinct instructional focus on teaching foundational skills associated with early literacy learning. A programmatic approach to the teaching of phonemic awareness, phonics, printing, spelling, and sight word recognition is consistently implemented by all teachers especially in the K-2 grades. All 11 classes of Grade 4 teachers and their students (N=245) volunteered to participate in this writing study, now in its sixth year.

Procedures

Following a research ethics protocol, a prompt for eliciting expository prose was designed and field tested in order to sample the full range of children's productive vocabulary knowledge (Roessingh, 2012). We refer to our prompt as Healthy Living (Appendix A). The pre-writing activity allowed for some teacher talk and "think-pair-share" to focus the students' thoughts and to ensure they understood the writing task. The planning and pre-writing activity was also encouraged before the students were set to the task of writing with no further interaction with the teacher or their classmates. To glean insights into children's independent level of writing abilities, we collected first draft writing. The students' regular classroom teachers administered the writing task within classroom time. Up to 60 minutes was allocated for the entire process. The samples were collected at the end of the school year and masked at the school level to protect the identity of the student authors before being transferred to us.

Scoring and Data Analysis

The writing samples were digitized and marked for quality standard by way of a trait-based rubric (see Appendix B) and assigned a holistic score. The step was taken to minimize the potential of marker bias by way of the presentation effect described earlier. The writing samples were rated by two independent researchers who were trained in the use of the rubric. Ratings assigned were 1: Limited, 2: Adequate, 3: Proficient, and 4: Excellent. First, a Pearson product-moment correlation coefficient was calculated to determine agreement between the two raters. The resulting value was .92. Secondly, an intra-class correlation coefficient was calculated based on the ratings given by the two raters and the Grade 4 teachers. This was determined to be .85 for the three sets of ratings, producing a Cronbach's alpha of .87, which is considered above satisfactory internal consistency. These statistics proved important for validating the two raters' holistic ratings in terms of grade-level expectations.

The handwritten writing samples were marked for printing quality following the rubric illustrated in Figure 1. Standard setting samples of writing were selected for reference purposes focusing on consistency in the traits identified in the rubric (shape, size, spacing, slant). Figure 2 provides an example of belaboured handwriting, Figure 3 presents an illustration of legible handwriting, Figure 4 offers a sample of controlled handwriting, and Figure 5 shows a case of fluent handwriting.

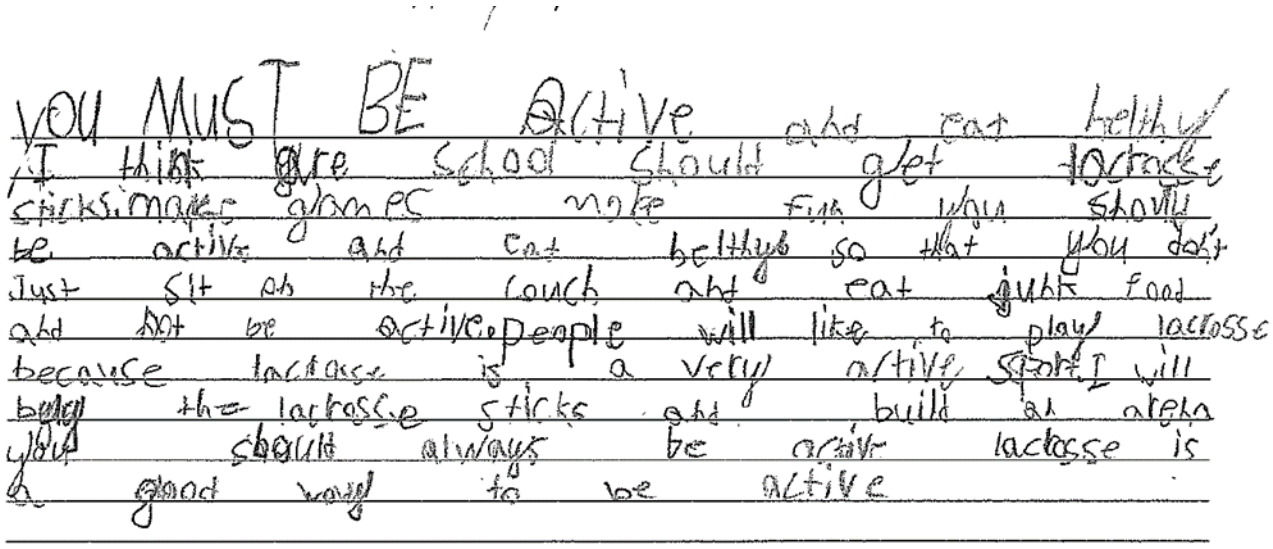


Figure 2. Sample of belabored handwriting.

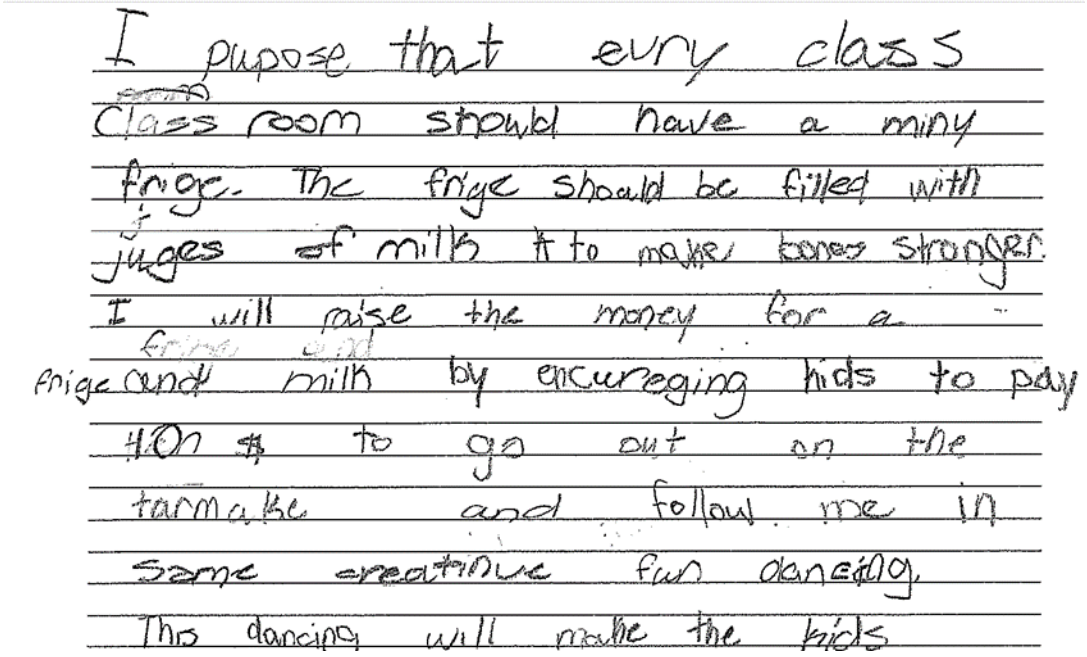
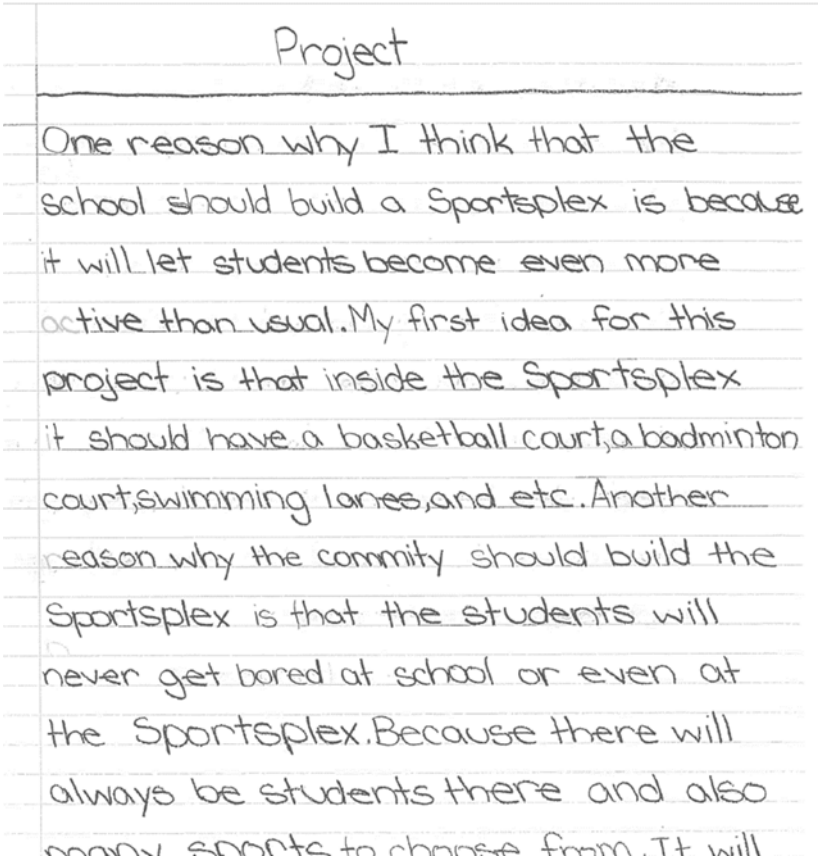
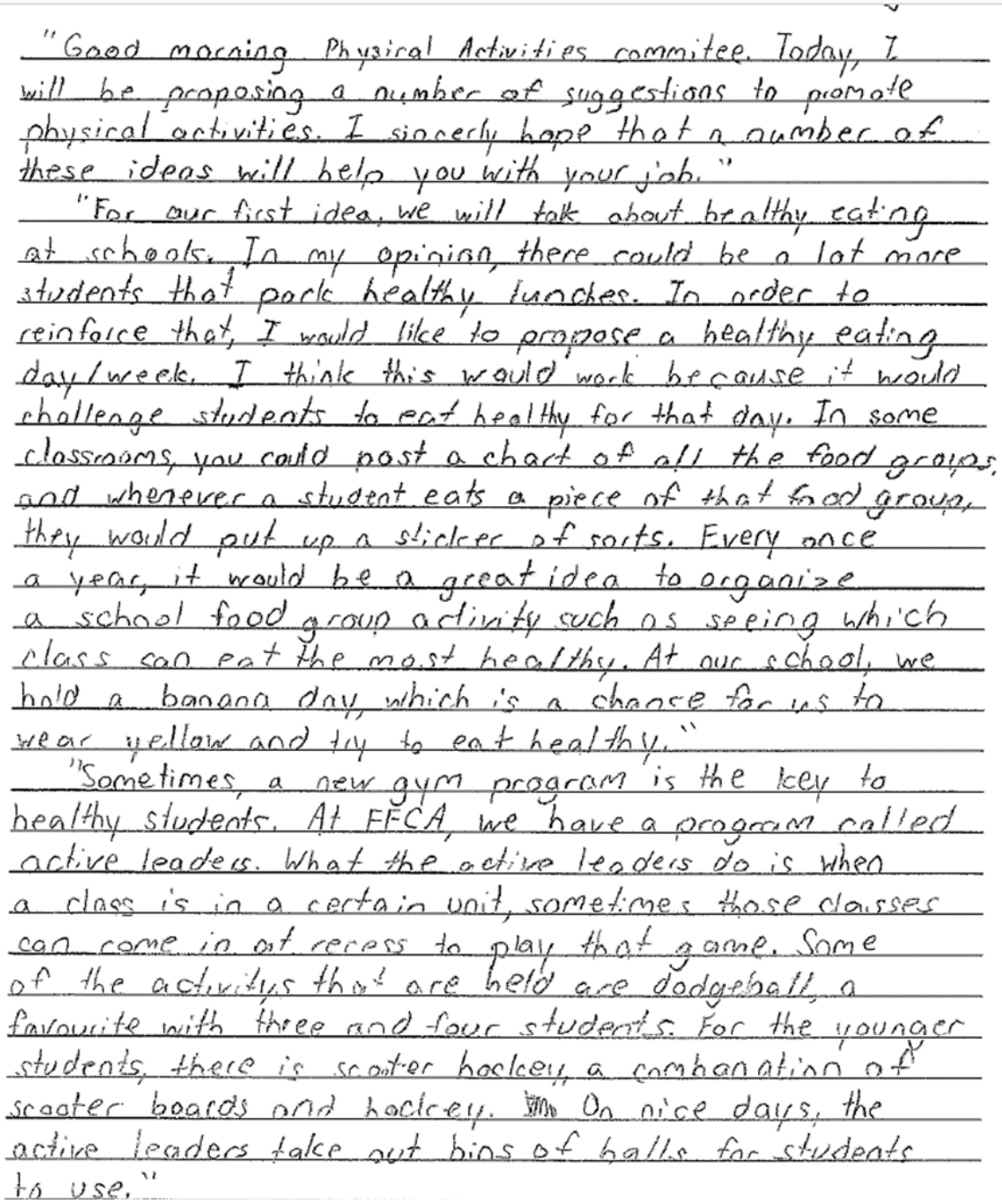

I pupose that evry class
Class room should have a miny
frige. The frige should be filled with
juges of milk to make bones stronger.
I will raise the money for a
frige and milk by encureging kids to pay
4.00 $ to go out on the
tarmake and follow me in
same creatinue fun dancing.
This dancing will make the kids

Figure 3. Sample of legible handwriting.


Project

One reason why I think that the school should build a Sportsplex is because it will let students become even more active than usual. My first idea for this project is that inside the Sportsplex it should have a basketball court, a badminton court, swimming lanes, and etc. Another reason why the commity should build the Sportsplex is that the students will never get bored at school or even at the Sportsplex. Because there will always be students there and also

Figure 4. Sample of controlled handwriting.



"Good morning Physical Activities commitee. Today, I will be proposing a number of suggestions to promote physical activities. I sincerly hope that a number of these ideas will help you with your job."

"For our first idea, we will talk about healthy eating at schools. In my opinion, there could be a lot more students that pack healthy lunches. In order to reinforce that, I would like to propose a healthy eating day/week. I think this would work because it would challenge students to eat healthy for that day. In some classrooms, you could post a chart of all the food groups, and whenever a student eats a piece of that food group, they would put up a stickcer of sorts. Every once a year, it would be a great idea to organize a school food group activity such as seeing which class can eat the most healthy. At our school, we hold a banana day, which is a chance for us to wear yellow and try to eat healthy."

"Sometimes, a new gym program is the key to healthy students. At FFCA, we have a program called active leaders. What the active leaders do is when a class is in a certain unit, sometimes those classes can come in at recess to play that game. Some of the activitys that are held are dodgeball, a favourite with three and four students. For the younger students, there is scooter hockey, a combination of scooter boards and hockey. On nice days, the active leaders take out bins of balls for students to use."

Figure 5. Sample of fluent, "in flow" handwriting.

Next, all spelling errors were corrected on the digitized samples in preparation for vocabulary profiling using an online profiling tool available in the public domain (www.lextutor.ca/vp/kids). The online profiling tool does not recognize misspelled words, allocating them to the "off-list" category where they skew the vocabulary profile. Words used in the prompt, and words we deemed "kid words" (e.g. yummy) were re-classified as Level 1 words, since these might also otherwise have been recorded as off-list words.

The digitized texts were submitted to the online vocabulary profiling tool which generates

various indices of lexical diversity including the total number of words or tokens (TNW), the number of different words (NDW), and the percentage of coverage of vocabulary arranged in 10 levels of 250-word families in order of word frequency. For the purposes of this inquiry, only the TNW metric was of interest. Recall this was chosen as our index of compositional fluency.

All quantitative data were initially entered into an Excel spreadsheet in preparation for analysis with SPSS version 23. Of the 250 samples submitted, a list wise deletion of 5 files for reasons of incomplete data yielded a final *N* of 245 samples.

Limitations of our Study

Our study is confined to one small school jurisdiction of 3,000 students, chosen strategically for its strong focus on early literacy foundational learnings and basic skills instruction in the K-2 years. A previous study of a Grade 2 cohort from this school jurisdiction (Roessingh, 2013) reflected this strong focus in the early literacy program: 93% of the students achieved at the satisfactory (adequate) standard or better for the overall quality of their writing, including at least legible handwriting. Nevertheless, this presents its own limitations. The school is a school of parental choice, hence there is a self-selection element at play. As previously mentioned, the demographic profile of the school reflects the diversity of today's large, urban school boards including the number of Canadian born children of immigrants who may or may not be identified as English Language Learners. By Grade 4, the vast majority of these students are fully integrated and no longer receiving any second language learning support. The students are overall considered to be typical young learners—none in our sample are coded as special needs students. We are nevertheless cognizant of factors related to school culture (e.g. uniforms; a consistent, school-wide designed instruction that focuses on foundational learnings and basic skills development; consistent expectations and assignment of homework) and parental expectations that play a role in children's early literacy development.

It should be noted that adoption of the trait-based rubric for evaluating the quality standard for each sample represents simply one perspective of writing. However, a perusal of the research on the development of written composition reflects a high degree of consensus concerning the features or traits of good quality writing including interesting ideas and topic development, organization, word choice, and conventions. The administration protocol for obtaining the writing samples is another choice we made, cognizant of certain trade-offs this would entail. Time, topic familiarity, and genre, for example, all constrain writers' abilities to put words on the page. In the interests of obtaining the samples in the classroom context and encouraging the young writers to submit their best efforts on an authentic-like writing task, we sought to minimize stress around a "test" setting (most students did not realize this was "a test"), to adopt a process approach to the writing (e.g. the pre-writing planning and outlining, the writing and reflection statements) within one period of time to sit the writing task, and to provide sufficient time for students to develop their ideas on a topic that was familiar yet challenging for them.

Findings

This section begins with descriptive statistics on the holistic quality ratings of the writing samples, the quality of the printing (language by hand) and the fluency of the handwriting as reflected in the total number of words generated in the writing samples. An inferential analysis in response to our two guiding research questions relating to quality of handwriting and

quantity of words on the page (i.e. our fluency measure) follows. A mainly non-parametric approach was taken to the inferential analysis.

Table 1 shows the distribution of the quality ratings of the writing samples (*N*=245) from 11 Grade 4 classrooms.

Most of writing, 76.3%, is rated as either limited or adequate. Few students achieved the standard of excellence. This finding lies at the heart of our inquiry: what is the role of the quality of printing and quantity of production (total number of words) in this outcome?

Table 2 shows the distribution of the handwriting scores. Recall this was evaluated holistically as belabored, legible, controlled, and fluent on the 4 x 4 rubric developed for the purposes of this investigation.

Note that 56.7% of the students' writing samples were evaluated as either belabored or legible. A cursory glance at the data in Tables 1 and 2 reveals the connection between the quality writing outcome and the quality of handwriting. We pursue this finding further in our analysis.

Table 3 shows the range and the mean total number of words for the four quality writing standards. Recall that TNW was the measure we chose as a proxy for compositional fluency.

Table 1

Distribution of 4 Writing Quality Standards

Holistic Rating	Quality Standard	Number of Samples	Percent of Sample
1	Limited	60	24.5
2	Adequate	127	51.8
3	Proficient	51	20.8
4	Excellent	7	2.9
Total		245	100.00

Table 2

Distribution of scores for Quality of Handwriting

Holistic Rating	Quality Standard	Number of Samples	Percent of Sample
1	Belabored	6	4.0
2	Legible	133	52.7
3	Controlled	103	42.0
4	Fluent/"in flow"	3	1.2
Total		245	99.9

Table 3

Holistic Quality of Writing and Total Number of Words: Fluency

Holistic Rating	Quality Standard	Range in TNW	Mean TNW
1	Limited	29–350	94
2	Adequate	73–444	173
3	Proficient	157–547	277
4	Excellent	326–626	433

These data also suggest an association between fluency of the handwriting and the holistic rating of quality of the writing sample. There is a distinct, visible range in TNW within each standard. The differences in the mean TNW between the limited standard and the excellent standard are striking.

We noted the vast majority of the students were using a manuscript style of handwriting: only a few had begun to connect their letters into a style that is described as mixed mostly manuscript (mmm), and fewer still (N=7) had developed a cursive style of hand. We examined whether the style of the handwriting played a role in its fluency. A nonparametric t-test showed that style of handwriting is not associated with fluency (TNW). We also assessed whether the style of handwriting is associated with the holistic writing outcome, finding a non-significant value.

Of greater importance is the quality of the handwriting (i.e. belabored, legible, controlled, fluent/"in flow")—regardless of style, on fluency (TNW). To determine the nature of the relationship between the quality of the handwriting and the TNW, we conducted a Spearman correlation. A Spearman correlation coefficient was calculated because the variables were skewed and ordinal in nature $rs = .405$, $p < .001$, demonstrating a moderate positive correlation between the variables. Further, we question whether the quality of the handwriting influences the holistic rating of the writing samples. To determine the nature of the relationship between the quality of the handwriting and the holistic rating, we performed a Spearman correlation. A Spearman correlation coefficient was calculated because the variables were skewed and ordinal in nature $rs = .456$, $p < .001$, demonstrating a moderate positive correlation between the variables.

This line of analysis takes us to this question: does the quality of handwriting and quantity (or fluency) predict holistic quality writing standard? These are scored on a 4-point scale: 1: Limited, 2: Adequate, 3: Proficient, and 4: Excellent).

We conducted two ordinal regression models in SPSS using the PLUM procedure with a logit link function. In the first model, the quality of handwriting was entered as a predictor and the quality writing standard was entered as an outcome variable. In the second model, the total number of words was included in the model as a predictor. Adding the total number of words to the model increased the explanatory power of the model (from 26% to 63%), illustrated in Table 4.

In sum, the first model shows that the quality of the handwriting is positively related to the quality holistic rating of the writing sample. When the total number of words was added in the second model the variance accounted for by the model increased substantially. This is illustrated in Table 5.

The most salient findings of our inquiry relate to the quality and quantity of handwriting as these predict the quality rating of the writing sample. The findings suggest that an enormous amount of the variability of the outcomes in the holistic rating of the Grade 4 writing samples: 63%, may be explained by the degree of control young writers demonstrate in their handwriting together with the fluency of their handwriting as measured by the total number of words generated in the writing sample. We elaborate on these findings in the discussion that follows.

Discussion

The findings related to our first research question—the importance of quality of handwriting—accord well with those reported by others (Graham, 2009; Morin, LaVoie, & Montesinos, 2012).

Table 4

Summary of Two Ordinal Regressions Predicting Writing Quality

	Writing Quality					
	Initial Model			Full Model		
Predictor Variable	Coefficient	*SE*	*P*	Coefficient	*SE*	*p*
Quality of Handwriting	2.056	.278	<.001	1.398	.318	<.001
Total number of words				.022	.002	<.001
Pearson χ^2	33.265 (df=32)		.405	555.194 (df=661)		.99
Nagelkerke Pseudo R>^{2}	.256			.632		

Table 5

Means and Standard Deviations of TNW and Quality of Handwriting for Each Quality Writing Quality Standard

	Total Number of Words	Quality of handwriting
Holistic Rating		
1. Limited	93.68	2.21
	(50.35)	(.52)
2. Satisfactory	172.67	2.49
	(66.12)	(.45)
3. Proficient	276.78	2.86
	(84.51)	(.41)
4. Excellent	433.42	3.32
	(132.74)	(.37)
Range	29-626	1-4

The single most striking finding from our inquiry relates to this question. Nearly 57% of the students' handwriting is rated as legible or belabored. It would seem that young students need to have better control over this transcription skill in order to realize better writing (composing) outcomes. In this school jurisdiction, printing instruction is emphasized only in Grades 1 and 2, with the vast majority of young students producing legible handwriting by the end of Grade 2 (Roessingh, 2013). It would appear, however, that off to a good start is not enough. The findings of the present inquiry underscore those previously reported in the research emphasizing the importance of sustained instructional attention on handwriting into the upper elementary years (Graham, 2009) with the goal of developing fluency of hand.

The style of the handwriting does not matter: the greater impact on the quality writing standard results from the quality of the handwriting together with the compositional fluency, as reported as TNW. This was our second research question. Tables 4 and 5 above summarize this outcome: the better the quality of the handwriting, the greater the TNW and the better the quality of the written composition. Those scoring at the standard of excellence far outpace those at the proficient, adequate and limited standards.

An immediate course of action for Grade 3-4 practitioners to help their young learners achieve better quality writing outcomes is to allocate instructional time and attention to handwriting (Mason, 2016). Better quality handwriting will promote compositional fluency, and in turn, the quality writing produced. It is worth noting that young students who execute better printing also make a better transition to keyboarding. Connelly, Gee, and Walsh (2007) reported a high correlation between handwriting and keyboarding speed in Grade 5 and 6. Handwriting speed was consistently faster than keyboarding speed across all ages. Results showed that children's compositional quality was superior in the handwritten scripts as opposed to the keyboarded scripts. Keyboarded scripts were up to 2 years behind handwritten scripts in development. Writing by keyboard does not necessarily lead to improvements in script quality compared with handwritten scripts. Explicit keyboarding instruction (touch-typing) is needed to develop keyboarding fluency and unlock the full potential of the word processor for children's writing.

An increasing body of research literature emanating from the neurosciences in particular underscores the importance and benefits of handwriting, beginning from the earliest of literacy learning stages, and sustained through the years even into adulthood (Bounds, 2010; Korbey, 2013; Konnikova, 2014; van de Geyn, 2013). There are the beginnings of a movement afoot to re-introduce printing instruction in the early years (Heitin, 2016). It would appear this needs to be sustained into the upper elementary years, too.

Graham (2009) discussed the speed-accuracy trade-off that children make when the working memory is over-taxed by the resource demands of handwriting, compositional fluency and text generation. The writing sample in Figure 6, illustrates the point that legibility is compromised when speed/productivity is of the essence. The breakdown is evident.

Our contribution is related to translating our findings (and those of researchers who we have cited) into classroom level models and benchmarks that Grade 4 teachers and even young learners can readily use as well. We also have used online software for assessing language and literacy outcomes (www.lextutor.ca/vp/kids) that teachers, students, researchers, and Ministry level staff involved in assessment can easily use for a variety of purposes.

Conclusion

There is something to be said for the appearance of handwriting, though it goes beyond the presentation effect. The quality of the handwriting reveals much about the writer that can alert the classroom practitioner of the need for intervention for individual students. And, as a class, teachers need to be mindful of how handwriting can constrain both compositional fluency and quality.

Children make unavoidable trade-offs: they focus on the immediate requirements of the task at hand. As Graham (2009) noted, legibility is compromised when speed is of the essence in getting ideas onto the page. Direct, instructed support can address some of this trade-off: better control over the handwriting can improve both fluency and compositional quality.

In the present study, only 3% of the students achieved the standard of excellence. Like the diverse, general population of Grade 4 students who they represent, too few are reaching the standard of excellence, and too many are achieving only an adequate level at Grade 4. It would seem that sustaining instruction in handwriting yields benefits, though instruction further needs to include writing practice and opportunities to write for authentic, meaningful purposes. An important proviso cautions against over-emphasis of handwriting on writing quality outcomes

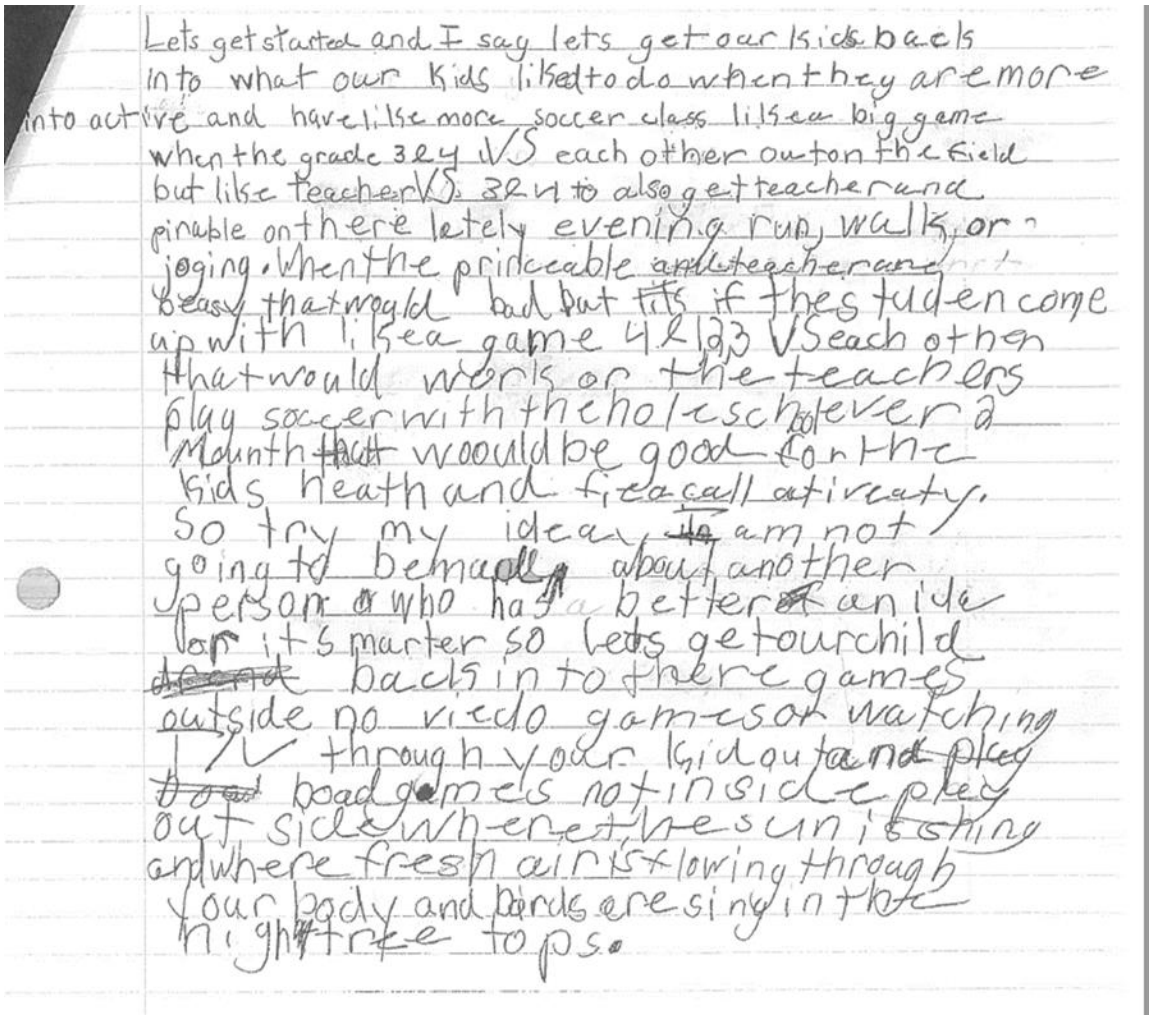


Figure 6. The speed-accuracy trade off (SAT).

even though it accounts for such a significant portion of the variance in quality writing outcomes. Among English language learners, for example, strong presentation effects can mask gaps in vocabulary knowledge (Roessingh, 2018). On the other hand, poor handwriting among gifted children can mask vocabulary strengths (Roessingh & Bence, 2017). Diverse learner profiles in the inclusive mainstream classroom and the quality of writing that young learners produce needs to be understood at a deeper level and particular learning needs specifically addressed. Additional assessment information is important in developing a full understanding of the range of learning needs and those of individual students in today's inclusive class setting. Underachievement in transitional literacy learning may have different underlying causes that classroom practitioners need to bring to the fore, though for only very few—perhaps 5% of young students, can this be attributed to neuro-motor impediments (Roberts et al., 2014).

The digital world is certainly here to stay but rather than displacement of legacy formats of literacy in the analog world, we seek a more complementary relationship. We advocate for stronger foundational learnings and upstream interventions built through the hands with engagements in the material world in real time that will lay the groundwork for stronger written

literacy development in the K-3 years, followed by sustained instructional attention to developing fluency in handwriting through connected script. We advocate for a balanced approach and a research agenda that will yield stronger insights into the strengths and possibilities of digital media integrated with the analog world, producing a synergy in learning outcomes when the best of both worlds meet. The maker movement is one example of how this might be realized.

Our future work will include a more detailed examination of the role of handwriting in unleashing vocabulary choices in quality writing outcomes for students in Grade 4. Mobilizing vocabulary is recognized as a key feature of quality writing outcomes, especially as young students engage with more academically demanding curriculum and expository genres. The reading research underscores the importance of vocabulary knowledge in shifting from learning to read to reading to learn. The phenomenon of "the Grade 4 slump" signals the emphasis on comprehending increasingly complex texts that assume a critical threshold of receptive vocabulary knowledge estimated at 9,000-word families (Biemiller & Slonim, 2001). The threshold of productive vocabulary that young writers may be expected to put on the page is an open question we would like to pursue in examining the vocabulary profiles of the writing samples we have on hand.

Acknowledgements

This research was supported through an AACES grant (ATA). We acknowledge with gratitude our partnering research school, Foundations for the Future. We are grateful for the feedback received from those reviewers who provided specific, encouraging directions to improve our work, and we extend our appreciation to the editorial team at AJER who shepherded our manuscript through the publication process. Thank you.

References

Abbott, R., &. Berninger, V. (1993). Structural equation modeling of relationships among developmental skills and writing skills in beginning and developing writers. *Journal of Educational Psychology, 85*(3), 478-508. Retrieved from https://doi.org/10.1037/0022-0663.85.3.478

Alston, J. (1985). The handwriting of seven to nine year olds. *British Journal of Special Education, 12*(2), 68-72. Retrieved from https://doi.org/10.1111/j.1467-8578.1985.tb00609.x

Anderson, D. (1969). What makes writing legible? *The Elementary School Journal, 69*(7), 364-369. Retrieved from https://www.jstor.org/stable/1000270

Applebee, A., & Langer, J. (2006). The state of writing instruction in America's schools: What existing data tell us. Center on English Learning & Achievement: University at Albany State University of New York. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.541.4136&rep=rep1&type=pdf

Applebee, A., & Langer, J. (2012). What is happening in the teaching of writing? In R. Robinson, M. McKenna, & K. Conradi (Eds.), *Issues and trends in literacy education* (5th ed.) (pp. 18-28). New York, NW: Pearson. Retrieved from https://www.nwp.org/cs/public/download/nwp_file/12493/What_is_Happening_in_the_Teaching_of_Writing_Applebee_Langer.pdf?x-r=pcfile_d

Berninger, V. (1999). Coordinating transcription and text generation in working memory during composing: Automatic and constructive processes. *Learning Disability Quarterly, 22*(2), 99-112. Retrieved from https://doi.org/10.2307/1511269

Biemiller, A., & Slonim, N. (2001). Estimating root word vocabulary growth in normative and advantaged populations: Evidence for a common sequence of vocabulary acquisition. *Journal of Educational Psychology, 93*(3), 498-520. Retrieved fromhttps://doi.org/10.1037/0022-0663.93.3.498

Boekaerts, M., Nieuwenhuizen, C., & Seegers, G. (1992). Quality of handwriting: Self-assessment as a tool for improvement. *Conference proceedings: European conference for educational research*, 314-316. Enschede, The Netherlands. Retrieved fromhttp://doc.utwente.nl/96172/1/ED350334.pdf

Bounds, G. (October 5, 2010). How handwriting boosts the brain. *The Wall Street Journal*. Retrieved from https://www.wsj.com/articles/SB10001424052748704631504575531932754922518

Boyd, G. (1970). *Teaching communication skills in the elementary school*. Toronto, ON: D. Van Nostrand Company.

Chall, J., & Jacobs, V. (2003, Spring). Poor children's fourth grade slump. *American Educator*. Retrieved from http://www.aft.org/periodical/american-educator/spring-2003/classic-study-poor-childrens-fourth-grade-slump

Christensen, C. (2009). The critical role handwriting plays in the ability to produce high-quality text. In R. Beard, D. Myhill, J. Riley, & M. Nystrand (Eds.), *The Sage Handbook of Writing Development* (pp. 284-299). Thousand Oaks, CA: Sage Publications. Retrieved from https://www.schools.utah.gov/file/8e185248-724f-4c01-a9a3-15d7442a10e8

Connelly, V., Gee, D., & Walsh, E. (2007). A comparison of keyboarded and handwritten compositions and the relationship with transcription speed. *British Journal of Educational Psychology, 77*(2), 479-492. Retrieved from https://doi.org/10.1348/000709906X116768

Cutler, L., & Graham, S. (2008). Primary grade writing instruction: A national survey. Journal of *Educational Psychology, 100*(4), 907-919. Retrieved from http://www.psy.cmu.edu/~siegler/418-cutler08.pdf

Gentry, R. (1982). An analysis of developmental spelling in GNYS AT WRK. *The Reading Teacher, 36*(2), 192-200. Retrieved from https://www.jstor.org/stable/20198182

Graham, S., & Weintraub, N. (1996). A review of handwriting research: Progress and prospects from 1980 to 1994. *Educational Psychology Review, 8*(1), 7-87. Retrieved from http://www.jstor.org/stable/23359270

Graham, S., Berninger, V., Abbott, R., Abbott, S., & Whitaker, D. (1997). The role of mechanics in composing of elementary school students: A new methodological approach. *Journal of Educational Psychology, 89*(1), 170-182. Retrieved from http://dx.doi.org/10.1037/0022-0663.89.1.170

Graham, S., Berninger, V., & Weintraub, N. (1998). The relationship between handwriting style and speed and legibility. *The Journal of Educational Research, 91*(5), 290-297. Retrieved from http://dx.doi.org/10.1080/00220679809597556

Graham, S. (2009). Want to improve children's writing? Don't neglect their handwriting. *American Educator, Winter 2009/10*, 20-27, 40. Retrieved from http://www.aft.org//sites/default/files/periodicals/graham.pdf

Heitin, L. (2016 October 17). Why don't the common-core standards include cursive writing? *PBS News Hour*. Retrieved from https://www.pbs.org/newshour/education/scary-clown-rumors-serious-business-schools

Janus, M., & Reid-Westoby, C. (2016). Monitoring development of all children. The Early Development Instrument. *Early Childhood Matters, 125*, 40-46. Retrieved from https://bernardvanleer.org/app/uploads/2016/07/Early-Childhood-Matters-2016_7.pdf

Jones, D., & Christensen, C. (1999). Relationship between automaticity in handwriting and students' ability to generate written text. *Journal of Educational Psychology, 91*(1), 44-49. Retrieved from https://doi.org/10.1037%2F0022-0663.91.1.44

Kent, S., & Wanzek, J. (2016). The relationship between component skills and writing quality and production across developmental levels: A meta-analysis of the last 25 years. *Review of Educational Research, 86*(2), 570–601. Retrieved from https://doi.org/10.3102/0034654315619491

Konnikova, M. (2014 June 2). What's lost as handwriting fades? *New York Times*. Retrieved from www.nytimes.com/2014/06/03/science/whats-lost-as-handwriting-fades.html?_r=0

Korbey, H. (2013). Should schools still teach cursive? MindShift: How we will learn. Retrieved from http://blogs.kqed.org/mindshift/2013/06/should-schools-still-teach-cursive/

Mason, J. (2016). Handwriting fluency and legibility. Intervention program for schools. Warwickshire County Council. Retrieved from https://www.swft.nhs.uk/application/files/2914/6158/0965/6_handwriting_fluency_and_legibility.pdf

MacKenzie, N. (2016). Keyboarding, handwriting or both in 21st century learning. *Australian Association for Research in Education*. Retrieved from https://www.aare.edu.au/blog/?p=1585

McCutchen, D. (1996). A capacity theory of writing: Working memory in composition. *Educational Psychology Review, 8*(3), 299-325. Retrieved from https://www.jstor.org/stable/23359419

Medwell, J., & Wray, D. (2014). Handwriting automaticity: The search for performance standards. *Language and Education, 28*(1), 34-51. Retrieved from https://doi.org/10.1080/09500782.2013.763819

Morin, M., LaVoie, N., & Montesinos, I. (2012). The effects of manuscript, cursive or manuscript/cursive styles on writing development in Grade 2. *Language and Literacy, 14*(1) 110-124. Retrieved from https://doi.org/10.20360/G21S3V

Nelson, N., & Van Meter, A. (2007). Measuring written language ability in narrative samples. *Reading & Writing Quarterly, 23*(3) 287-309. Retrieved from https://doi.org/10.1080/10573560701277807

Peverly, S. (2006). The importance of handwriting speed in adult writing. *Developmental Neuropsychology, 29*(1), 197-216. http://dx.doi.org/10.1207/s15326942dn2901_10

Pontart, V., Bidet-Ildei, C., Lambert, E., Morisset, P., Flouret, L., & Alamargot, D. (2013). Influence of handwriting skills during spelling in primary and lower secondary grades. *Frontiers in Psychology, 4*. Retrieved from https://doi.org/10.3389/fpsyg.2013.00818

Prensky, M. (2005 December 2). Shaping tech for the classroom. *Edutopia*. Retrieved from http://www.edutopia.org/adopt-and-adapt-shaping-tech-for-classroom

Prince Edward Island, Department of Education and Early Childhood Development (DEECD) (2012). Department of Education and Early Childhood Development: Guidelines for Handwriting Instruction: Printing and Cursive, Kindergarten to Grade 6. DEECD: Prince Edward Island, Canada. Retrieved from https://www.princeedwardisland.ca/sites/default/files/publications/eelc_cursive_guide_k-6.pdf

Roberts, G., Derkach-Ferguson, A., Siever, J., & Rose, M. (2014). An examination of the effectiveness of Handwriting Without Tears® instruction. *Journal of Occupational Therapy, 81*(2), 102-113. Retrieved from https://doi.org/10.1177/0008417414527065

Roessingh, H. (2012). The importance of the prompt for eliciting language samples: Insights from research and considerations for practice. *TexELT: Texas English Language Teaching, 1*(1), 37-56. Retrieved from http://www.textesolv.org

Roessingh, H. (2013). A look at Grade 2 Writing: Successes and challenges in early literacy development. *Learning Landscapes, 7*(1), 269-281. Retrieved from http://learninglandscapes.ca/index.php/learnland/article/view/642/642

Roessingh, H., & Bence, M. (2017). Intervening in early written literacy development for gifted children in Grade 2: Insights from an action research project. *Journal for the Education of the Gifted, 40*(2), 168-196. Retrieved from https://doi.org/10.1177/0162353217701201

Roessingh, H. (2018). Unmasking the early language and literacy needs of ELLs: What K-3 practitioners need to know and do. *BC TEAL Journal 3*(1), 22–36. Retrieved from http://ejournals.ok.ubc.ca/index.php/BCTJ/article/view/276

Rosenblum, S., Weiss, P., & Parush, S. (2003). Product and process evaluation of handwriting difficulties: A review. *Educational Psychology Review, 15*(1), 41-81. Retrieved from http://www.jstor.org/stable/23361534

Sanacore, J., & Palumbo, A. (2008.) Understanding the fourth-grade slump: Our point of view. *The Educational Forum, 73*(1), 67-74. Retrieved from https://doi.org/10.1080/00131720802539648

Spalding, R. (2012). The writing road to reading (6th ed.). New York, NY: Harper Collins.

Stevenson, N., & Just, C. (2014). In early education, why teach handwriting before keyboarding? *Early Childhood Education Journal, 42*(1), 49-56. Retrieved from https://doi.org/10.1007/s10643-012-0565-2

Twenge, B. (2017, September). Has the smartphone destroyed a generation? *The Atlantic*,58-65. Retrieved from https://theoxfordconclave.org/wp-content/uploads/2017/09/Has-the-Smartphone-Destroyed-a-Generation_The-Atlantic_Sept-2017.pdf

van de Geyn, L. (2013). The end of cursive writing in schools? Schools across Canada are removing cursive from the curriculum. Is it outdated or still a valuable life skill? *Today's parent*. Retrieved from https://www.todaysparent.com/family/cursive-writing-in-schools/

Wojtalewicz, B. (2016). An investigation of productive vocabulary in upper elementary: Corpus-based lexical analysis of Grade 4 learners' expository writing (Unpublished Master's thesis). Werklund School of Education, University of Calgary: Calgary, AB. Retrieved from https://prism.ucalgary.ca/bitstream/handle/11023/2995/ucalgary_2016_wojtalewicz_brock.pdf?sequence=5

Yates, C., Berninger, V., & Abbott, R. (1995). Specific writing disabilities in intellectually gifted children. *Journal for the Education of the Gifted, 18*(2), 131-155. Retrieved from https://doi.org/10.1177/016235329501800203

Hetty Roessingh is a Professor in the Werklund School of Education, University of Calgary. Her research continues to focus on the role of vocabulary knowledge in literacy development over time, noting patterns in different learner profiles that can inform classroom instruction, assessment practices and policy.

Dr. Nordstokke is an Associate Professor in the Werklund School of Education at the University of Calgary. He received his PhD in 2009 from the University of British Columbia in Measurement, Evaluation and Research Methodology. He teaches courses in the area of measurement, research design and statistical analysis. Dr. Nordstokke conducts research across a variety of educational and psychological contexts. Much of Dr. Nordstokke's current research revolves around youth transition/youth mental health and factors (e.g., resilience) that are related to successful transition and positive life and mental health outcomes. Many projects that Dr. Nordstokke engages in are interdisciplinary and collaborative in nature and his typical role in this type of research has him focusing on designing sound research studies, selecting valid measurement strategies, and applying statistical models to data that are gathered across a number of disciplines. Another part of Dr. Nordstokke's research is focused on applied methods that include: (1) the design of research studies, (2) the collection and statistical analysis of data, and (3) the interpretation and dissemination of results.

Mitch Colp is an Adjunct Faculty member in the Werklund School of Education, University of Calgary. He does psychological assessments and research in a private practice.

Appendix A: Writing Prompt: Healthy Living

WRITING TASK

All students in the school are asked to do some writing. Read the information below and think about how you will do the writing assignment.

TO THINK ABOUT BEFORE WRITING
We know that many young people today are not as physically active as they need to be. Every student in the school has been asked for ideas about what to do to get students to become more active. A committee of teachers and parents will choose the best suggestions.

IN YOUR WRITING

Write a proposal for the committee to read. Describe what you would do to promote physical activity and a healthy lifestyle. Then, convince the committee that your idea is the best way to make it happen.

DIRECTIONS FOR WRITING

You will have up to 60 minutes to plan and write, so budget your time carefully.

Use the PLANNING page to plan your writing. You may brainstorm, web, draw, or list ideas. Think of details that will be interesting and entertaining.

Use the WRITING pages to write a first draft. You may show changes and corrections on your first draft. Do not write a 'good copy'. If you need more space to write, use the back of the writing pages. Please number your extra pages.

Your work will be evaluated on WHAT your write and HOW WELL you write. Remember to:

- CONSIDER your audience
- PRESENT your ideas in prose
- ORGANIZE your writing as required by the task
- FOCUS on the purpose of your writing

Appendix B: Trait-Based Rubric

Performance Criteria-Grid Format

WRITING ELEMENTS	4 EXCELLENT	3 PROFICIENT	2 ADEQUATE	1 LIMITED
TASK FULFILLMENT	The writer fulfills the task and purposefully crafts a convincing proposal.	The writer fulfills the task and uses supportive details to present a credible proposal.	The writer addresses the task and uses sufficient details to make a plausible proposal.	The writer addresses the task to some degree and shares a sketchy proposal.
UNITY AND COHERENCE	The paper shows overall unity and reasoning is compelling.	The paper reads smoothly, and reasoning is systematic and believable.	The paper generally reads smoothly, and reasoning has a resemblance of actuality.	The paper is often awkward to read, and reasoning displays inconclusive support.
AUDIENCE	The writing sustains the reader's interest and engages the audience.	A consideration of audience is maintained throughout the writing.	A consideration of audience is conveyed but may not be sustained throughout.	Consideration of audience may be vague.
CONTENT AND TOPIC DEVELOPMENT	The ideas are focused and purposeful; topic development is skillful.	The ideas are clear and interesting; topic development is effective.	The ideas are general and often repetitive; topic development is predictable.	The ideas are reasonable but often underdeveloped; topic development is superficial.
VOCABULARY AND USAGE	Vocabulary and usage are often clever and chosen intentionally for the form and purpose.	Vocabulary and usage choices are precise and suitable for the form and purpose.	Vocabulary and usage choices are generally suitable for the form and purpose.	Vocabulary and usage choices are within a narrow range.
ORGANIZATION AND STYLE	The organization of the paper is controlled, and the style creates a sense of voice unique to the writer.	The organization of the paper is logical, and the voice and style are appropriate.	The organization of the paper is straightforward and may ramble.	There is evidence of difficulty in organizing ideas.
MECHANICS	Spelling, grammar, capitalization and punctuation applications are controlled to enhance the impact of writing; errors are hardly noticeable.	Spelling, grammar, capitalization and punctuation applications are effective; errors are few and do not interfere with the writer's intended meaning.	Spelling, grammar, capitalization and punctuation applications are uncomplicated; errors are evident and do not significantly interfere with the writer's intended meaning.	Spelling, grammar, capitalization and punctuation applications are inconsistent; errors may interfere with the writer's intended meaning.
KEY WORDS	Convincing Skillful Engaging Controlled	Credible Effective Interesting Logical	Plausible Predictable Straightforward Repetitive	Sketchy Superficial Vague Awkward