

A Sequential Mixed Methods Study of Preservice Handwriting Training and Classroom Handwriting Instruction in Texas

Cherry Craig Lee, EdD

Lamar University

USA

cherrycraiglee@gmail.com

<https://orcid.org/0000-0003-1619-894X>

Jerry Vincent Nix, PhD

Lamar University

USA

jnix2@lamar.edu

<https://orcid.org/0000-0002-5736-1339>

Abstract

Despite its importance in developing literacy, handwriting often receives scant attention during teacher training. The researcher utilized a mixed-methods approach implementing a two-phase sequential design to investigate teacher perceptions of preservice training in handwriting, as well as the provision of handwriting instruction across Texas schools. Despite reporting little or no handwriting instruction during training, teachers agreed that it is an important component within the literacy continuum and expressed concerns about a lack of district-level support for the subject, as well as concerns regarding implementing handwriting into a virtual curriculum.

Keywords: handwriting, teacher training, literacy, mixed-methods, Elementary Education,

Introduction

Literacy in the 21st century consists of a continuum of oral language, reading, and writing skills extending to both print and digital contexts (Morrell, 2012; Pilgrim & Martinez, 2013; Texas Education Agency [TEA], 2017a, 2017b). Enabling decision-making, collaboration, problem-solving, and participation in society (Gut, et al., 2012; World Literacy Foundation, 2015), literacy contributes to emotional well-being, academic achievement, and career success (Moats, 2020; Perin, 2019; Ritchie & Bates, 2013). Although reading is often prioritized in educational systems, writing is just as critical to educational and career success (Graham, 2019; Troia, 2014). A key element within a comprehensive primary writing curriculum is handwriting (Donica, et al., 2012; Graham, 2018), as it offers students a vehicle to record thoughts, demonstrate their knowledge, and express themselves (Graham & Hebert, 2010; Sheffield, 1996).

1.1 Review of the Literature

Handwriting is required for several important tasks throughout the school day: answering questions, summarizing, writing stories, journaling, solving math problems, and taking notes (Donica, 2010; Graham, 2018; Graham, et al., 2008; Sheffield, 1996). Even so, handwriting difficulties are common (Graham, 2018); teachers report 25% to 40% of all students demonstrate handwriting difficulties in the primary years (Graham et al., 2008; Vander Hart, et al., 2010). Furthermore, children across all grade levels who demonstrate poor penmanship are more likely to receive

lower grades on written assignments regardless of the quality of content (Graham, 2018; Graham et al., 2008). Further impacting grades and motivation, children who lack fluent handwriting skills often take longer to complete assignments and are more likely to experience frustration and turn in incomplete or late work than peers without handwriting difficulties (Graham, 2010). Moreover, children who have deficient writing skills are from the start less likely to want to write and do so less than their peers who are more proficient. As a result, struggling writers give themselves fewer opportunities to practice and apply new skills, further retarding their ability. (Graham, et al., 2018a). When children experience handwriting difficulties early in their educational careers, they face low self-esteem and motivation challenges and are at-risk for pervasive, persistent academic difficulties (Graham et al., 2008; Spear-Swerling, 2006). Clearly, handwriting plays an important role in student academic success (Graham, et al., 2018b; Graham et al., 2008; Sheffield, 1996).

1.2 Handwriting and the Development of Literacy Skills.

A positive relationship exists between handwriting proficiency and basic reading, spelling, and reading fluency skills. (Graham, et al., 2000; McCarroll & Fletcher, 2017). Emerging readers benefit from learning handwriting as it fosters fluency in both letter recognition and naming (Berninger, 1999; Longcamp, et al., 2016; Mayer et al., 2020). Kent and Wanzek (2016) conducted a meta-analysis that investigated the relationship between handwriting, spelling, reading, and oral language on writing quality and production, and their findings emphasized the importance of handwriting fluency in early grades, which had an enduring impact on the quality of written expression in fourth grade and beyond (Kent & Wanzek, 2016).

1.3 Concerns Regarding Teacher Implementation of Handwriting Instruction.

Handwriting contributes to stronger reading, spelling, and writing performance, yet emerging research indicates that early literacy teachers provide inconsistent and variable handwriting instruction (Coker et al., 2016; Graham et al., 2008; McCarroll & Fletcher, 2017; Vander Hart et al., 2010). McCarroll and Fletcher (2017) and Donica et al. (2012) emphasize that occupational therapists identify problems with handwriting as the root cause of concerns about writing proficiency for many of their referred students. This finding is not surprising when one considers that teachers report they receive little preservice training on teaching handwriting, and thus are likely unprepared to provide that instruction (Graham et al., 2008).

2.0 Framework, Methods, Design, and Procedures

The theoretical model underpinning this study is STR --the science of teaching reading. STR is a term used by educators and researchers alike to describe teacher implementation of evidence-based literacy instruction that gives students the best chance to acquire proficient reading and writing skills (Moats, 2020; Seidenberg, 2017). When educators apply the STR in their teaching contexts, they provide explicit, systematic instruction in the essential elements of reading (phonemic awareness, phonics, fluency, vocabulary, and comprehension) (Moats, 2020; National Reading Panel, 2000) and writing (handwriting, spelling, idea generation, drafting, composing, and revising) (Berninger & Amtmann, 2003; Graham, et al., 2018a).

2.1 Statement of the Purpose and Research Questions

The purpose of this study was to explore the perceptions of educators serving in early childhood education through grade five in Texas public and charter schools about their preservice training in handwriting instruction, their current implementation of handwriting instruction, and their rating of the importance of handwriting within literacy instruction (Drake & Walsh, 2020) . The following research questions guided the study:

1. What are teachers' perceptions of their preparedness to provide handwriting instruction?
2. How often is explicit handwriting instruction provided in elementary-school classrooms?
3. What type of curricula do teachers use to provide handwriting instruction?
4. How do early-literacy teachers prioritize handwriting instruction within the literacy continuum?

2.2 Research Design/Methods

This pre-experimental (Campbell, et al., 1966; Creswell & Plano Clark, 2018) sequential mixed-methods study gathered data from educators teaching literacy at primary schools in Texas. An initial investigation through an online survey instrument provided perceptions of—and provided explanations for—preservice training in handwriting, current handwriting instructional practices, and attitudes among educators regarding the importance

of such instruction. After the initial exploratory survey data was analyzed quantitatively, interviews were held with subsampled participants that had completed the questionnaire. This qualitative stage provided explanations and triangulation of data from each method provided a comprehensive understanding of educator perspectives.

Collecting data over two phases placed this research project squarely into the explanatory sequential design as suggested by Creswell and Guetterman (2019), Creswell and Plano Clark (2018). Furthermore, the sequential nature of the study allowed the researchers to conduct an exploratory investigation, conduct quantitative data operations and enhance those with qualitative data, analyses, and limited inference. Qualitative data were then analyzed to produce emerging categories. Mixing these quantitative and qualitative research techniques into a single study resulted in Tashakkori and Teddlie's (1998) "Type VI Mixed Design" (pp 165-166) .

2.3 Population/Participants

In Phase I of the study, the researcher surveyed teachers employed in public and charter school districts within Texas who: (a) were employed by a public or charter school as a general-education teacher, literacy specialist, or special-education teacher in early childhood through grade five, (b) provided language arts instruction, and (c) held valid, standard Texas teaching certificates. In Phase II, the researcher used purposive sampling to identify teachers from each triangulated subgroup.

2.4 Instrumentation

The researcher received permission via email to use and adapt a previously administered survey instrument titled Elementary Teacher Handwriting Survey (Donica et al., 2012), which probed educator perceptions of preservice handwriting training, attitudes towards the importance of handwriting instruction within the literacy continuum, and viewpoints on handwriting instruction within the context of virtual teaching using a four-point Likert Scale. For the purposes of Phase II, the researcher developed an interview protocol based on the findings of the survey data collected in Phase I. Using the protocol, the researcher conducted virtual interviews with a select group of teachers (n = 9).

2.5 Data-Collection Procedures

The researcher utilized a convenience sampling approach to invite potential respondents to complete the questionnaire via a social media campaign using the Qualtrics platform (Qualtrics, 2020). Targeted social-media posts using the Facebook platform were used to recruit potential participants (Facebook, 2020). One hundred forty-three persons provided initial survey consent; of that group, 106 met the study's inclusionary criteria. Of those respondents, 95 of the 106 completed the questionnaire in its entirety. Most respondents were female (95%) and provided language arts instruction in English (85%). Thirteen participants indicated they provided instruction in both Spanish and English and two participants indicated they provided instruction solely in Spanish. More general-education teachers (45%) than literacy specialists (39%) or special-education teachers (16%) participated in the study. Over half of participants reported the provision of both face-to-face and virtual (on-line) instruction (65%); the high number of teachers reporting providing virtual instruction was likely due to the consequences of the COVID-19 pandemic, as data for this study was collected August and September of 2020.

After analyzing quantitative data in Phase I, open-ended questions were formulated to gather additional perspectives. Within Phase II, a purposive, homogeneous sampling approach was utilized to deepen understanding of the research questions and identify emerging themes. Teachers (n = 9) who met the study's inclusionary criteria gave consent to be interviewed and were virtually interviewed. Participants included teachers from various-size districts across the Central and South regions of Texas including Dallas/Fort Worth, Houston, and San Antonio areas. All interviewees were female and engaging in virtual instruction or preparing to do so for the first several weeks of school, due to the COVID-19 pandemic. The educators, on average, had approximately 15 years of teaching experience.

3.0 Treatment of Data, Analysis of Data, and Major Findings

Data were analyzed sequentially due to this nature of this study, in phases. The following sections describe the procedures utilized in Phase I and subsequently, in Phase II.

3.1 Phase I: Quantitative Analysis and Findings for Research Question One

Quantitative data was collected to address answers for the first research question: *What are teachers' perceptions of their preparation to provide handwriting instruction?* Six questionnaire items measured by a four-point ordered-response scale (1=strongly disagree to 4=strongly agree) rated relative agreement with the following statements:

- My educator preparation program adequately prepared me to provide handwriting instruction;
- My educator preparation program included strategies for incorporating handwriting instruction into the overall curriculum;
- My educator preparation program prepared me to support children who are struggling in the area of handwriting (i.e., intervention, adaptations, or modifications);
- My educator preparation program provided me training on how to teach posture as a component of handwriting instruction;
- My educator preparation program provided me training on how to teach paper placement as a component of handwriting instruction; and
- My educator preparation program provided me training on how to teach pencil grasp as a component of handwriting instruction.

Since ordinal data were collected, the researchers utilized nonparametric statistics for analyses; additionally, the distributions for data did not pass the test for heteroskedasticity. Teachers disagreed overwhelmingly that they had been prepared in any of the six areas corresponding to the questionnaire statements. Table 1 illustrates this with the low medians and IQRs, along with modes of only one and two. While there was not absolute consensus (IQR=0) on any item, there was strong consensus that teachers did not feel prepared in any of these six areas.

3.1.1 Phase I: Quantitative Analysis and Findings for Research Question Two

Quantitative data was collected to address answers for the second research question: *How often is explicit handwriting instruction provided in elementary school classrooms?* Three questionnaire items addressed the frequency of handwriting instruction provided by teachers. Most teachers (n = 81, 84%) provided explicit handwriting instruction, providing an average of 10.35 minutes of handwriting instruction (SD = 6.48, SEM = 0.72, Min = 2.00, Max = 30.00, Skewness = 1.25, Kurtosis = 1.67) over 3.56 days per week. (SD = 1.11, SEM = 0.12, Min = 1.00, Max = 5.00, Skewness = -0.67, Kurtosis = -0.18). Participants entered the numbers themselves; the data were distributed normally on these questionnaire items. A General Linear Model test did not reveal any impacts that were significant, indicating that demographic variables did not explain a significant proportion of variation in handwriting instruction as measured by minutes per day or days per week.

3.1.2 Phase I: Quantitative Analysis and Findings for Research Question Three

Quantitative data was collected to address answers for the third research question: *What type of curricula do teachers use to provide handwriting instruction?* Skip logic was used to advance the 81 participants who responded (YES) that they provided handwriting instruction to another YES/NO item: Do you implement a specific curriculum in your classroom? Of those, most (n = 62, 77%) reported use of a specific handwriting curriculum; the frequencies and percentages of curricula identified by respondents are presented in Table 2.

3.1.3 Phase I: Quantitative Analysis and Findings for Research Question Four

Quantitative data were collected to address answers for the fourth research question: *How do early literacy teachers prioritize handwriting instruction within the literacy continuum?* Three questionnaire items measured on the same relative agreement (1=strongly disagree to 4=strongly agree) four-point ordered-response scale collected data to inform this research question. Participants were asked to rate their relative agreement with the following statements:

- Handwriting is an important component of early literacy instruction;
- Students benefit from explicit and systematic handwriting instruction; and
- Handwriting instruction is unnecessary because of our reliance on technology.

As this data was ordinal (and did not pass the test for heteroskedasticity) nonparametric analysis was used to report findings. Teachers overwhelmingly agreed that handwriting is an important component of early literacy instruction, an IQR of zero was achieved, indicating absolute consensus. Teachers also were adamant that students benefit from explicit and systematic handwriting instruction; here also, absolute consensus was achieved among respondents as IQR was equal to zero. While there was no absolute consensus achieved for the final statement, still, teachers

achieved strong consensus in disagreement that handwriting instruction is unnecessary because of reliance on technology; Table 3 provides an overview of these data.

3.1.4 Additional Quantitative Findings.

Data were further analyzed to explain teacher perceptions of handwriting instruction as provided through virtual environments. Participants were asked to rate their agreement with the following statements:

- I feel prepared to provide handwriting instruction in a virtual format;
- Student handwriting proficiency will be negatively impacted by COVID-19; and
- My school has provided resources, strategies, and tools for me to use to support students with handwriting in a virtual setting.

Approximately 65% of respondents (n = 63) disagreed or strongly disagreed they were prepared to provide handwriting instruction in a virtual format, while approximately 86% (n = 83) agreed or strongly agreed student handwriting proficiency would be negatively impacted by COVID-19. Nearly 75% of respondents (n = 71) disagreed or strongly disagreed that their school has provided the resources, strategies, and tools needed to support handwriting instruction in a virtual setting. Table 4 illustrates that the only strong consensus was achieved in the belief that Covid-19 would negatively impact students' handwriting proficiency, although absolute consensus was not achieved.

3.2 Phase II: Qualitative Findings for Research Question One

Qualitative data was collected to address answers for research question 1: *What are teachers' perceptions of their preparation to provide handwriting instruction?* All nine interviewees voiced concerns that their preservice coursework and training had left them unready to provide handwriting instruction. A reading interventionist emphasized, "I don't recall having any training to be able to teach [handwriting]." Likewise, another veteran general-education teacher noted, "I took a few classes about how to teach reading, or how to teach science or social studies, but not handwriting. Handwriting was never taught."

Two teachers—one special-education and one general-education—mentioned completing a semester-long writing course during preservice training. However, both noted that although the course focused on writing as a process, it did not specifically address handwriting. A new-to-the-field special- education teacher recalled:

We had one class that was like a general-education class about writing, so it focused a lot on writer's workshop. So we talked about the process of writing...but the handwriting process – we didn't talk very much about that... We didn't talk about, like, "What am I going to do if my kid can't write or even hold a pencil?"... I feel like that piece was missing. We really didn't get any handwriting or writing instruction for children that are having difficulties – which was unfortunate.

3.2.1 Phase II: Qualitative Findings for Research Question Two.

Qualitative data was collected to address answers for research question 2: *How often is explicit handwriting instruction provided in elementary-school classrooms?* Interviewees generally agreed they provided some form of handwriting instruction throughout the school year, although the amount of instruction varied across all three subgroups of teachers. A special-education teacher said she provided explicit handwriting instruction every day for students receiving language- arts pull-out services, but in short two-minute sessions. Likewise, a literacy specialist said she provided handwriting instruction for 3-5 minutes during daily small-group reading intervention sessions. Several teachers also noted inconsistencies in implementing handwriting instruction across grade levels within their school. A veteran fifth-grade educator emphasized this variability at her campus:

There are some teachers that teach [handwriting], but there are some that don't. I know one teacher is very strong in third grade about handwriting, but the other two third teachers are not. Those kids don't get anything. Then, it drops off in fourth grade...it's a real surprise when the kids come to me...they don't know how to form letters.

Similarly, a veteran kindergarten teacher said, "I feel like now in the district, some teachers don't provide any handwriting." A general-education teacher noted, "I would say handwriting instruction has been very inconsistent in both districts where I've worked. Handwriting wasn't happening in any grade level across K-5...I saw writing, but not handwriting." A literacy specialist expressed concern that only a handful of teachers taught handwriting at her school, even though handwriting is included within state standards through fifth grade. Lastly, four teachers

noted that a lack of dedicated time during the language-arts instructional block served as a significant barrier to providing consistent handwriting instruction.

3.2.2 Phase II: Qualitative Findings for Research Question Three.

Qualitative data was collected to address answers for research question 3: What type of curricula do teachers use to provide handwriting instruction? During video recorded interviews, interviewees mentioned the current use and implementation of three curricula specific to handwriting: Handwriting Without Tears (n = 4), Zaner-Bloser (n = 1), and Basic Language Skills (n = 2). A literacy specialist indicated her district did not provide a curriculum for or training in handwriting instruction for general- or special- education teachers. She indicated that district apathy towards handwriting instruction led to inconsistent practices across schools and most teachers not paying “attention to the fundamentals [of] letter writing.” A kindergarten teacher noted that although the district she works for adopted a handwriting curriculum ten or so years ago, she did not receive any formal training on how to implement the curriculum. Moreover, recalling her reassignment to kindergarten from second grade, she remarked:

When I took over kindergarten, I found some Handwriting Without Tears stuff in the classroom, but it was just... there. I never had a manual to go with it. It was just pieces and parts of it from people that had probably used it before me. I didn't get training on how to use anything.

Likewise, another general-education teacher noted:

In my seven and a half years of teaching kindergarten, it took six years just to actually get a handwriting curriculum just even adopted. And even then, the district just kind of gave it to us: [implying] “Here is the TE [teacher edition].” They didn't provide any training.

A literacy specialist working in a charter school emphasized, “There's not a lot of professional development related to literacy. None for handwriting. For new teachers, that [professional development] comes through their grade level leads if at all.” She voiced concerns that her campus did not build time into the schedule for handwriting and did not provide teachers with any formal curriculum. Interviewees that indicated their district had adopted a specific curriculum raised concerns regarding training and difficulties obtaining teacher editions and student consumables such as workbooks and lined paper.

3.2.3 Phase Two: Additional Qualitative Findings, Concerns About Virtual Instruction

All interviewees indicated concerns about the lack of support and training from district and campus leadership regarding the implementation of virtual literacy instruction, including handwriting, due to the COVID-19 pandemic, and no teachers reported receiving formal direction from their school districts or campus leaders about how to provide remote handwriting instruction. Moreover, several teachers expressed concern about the time and effort it took to develop virtual lesson plans. A kindergarten teacher noted, “We haven't received anything [from district leadership]. So, I've been planning...and it's literally been like reinventing the wheel – kind of starting from scratch.” Most of the interviewees also expressed concerns about how to provide feedback and support for children during virtual instruction.

3.2.3.1 Equity and Preservice Instruction

During one-on-one interviews, teachers overwhelmingly expressed support for preservice handwriting instruction, as well as for improvements in literacy training in general. When asked how improvements in preservice training of foundational literacy skills, including handwriting instruction, could be used to build equity in schools, a veteran literacy specialist emphasized, “Having preservice training implemented first and building that foundation for those preservice teachers to be able to... turn around and teach it is absolutely beneficial.” Reflecting on her own experiences and lack of evidence-based literacy instruction, she noted, “You look back after five years and say, ‘Look at what I didn't do because you didn't know any different.’ And then those are students aren't getting the quality teacher that they should be getting.” Educators collectively agreed that students benefit when teachers can support literacy development and intervene when necessary.

4.0 Discussion and Summary of Major Findings

Based on the mixed data collected and analyzed, the researcher concluded that the participants in this study, regardless of position type or certification pathway, are not prepared by their preservice training to provide handwriting instruction, and the interviewees connected inconsistencies in instruction to variability in the students'

handwriting outcomes. Nevertheless, the majority (no demographic characteristic impacted any of the results) reported teaching handwriting: approximately 84% of the survey participants ($n = 81$) and all the interviewees ($n = 9$) indicated they did so. approximately 75% of this group identified use of a specific curriculum. Notably, interviewees shared significant worry around obtaining a primary handwriting curriculum, instructional materials, and student consumables from school leadership, and identified specific needs related to virtual instruction which remained unaddressed by their schools. In general, survey responses raise concerns regarding the level of district-level support throughout Texas for handwriting instruction. Despite these difficulties, the educators overwhelmingly agreed that handwriting is an important of literacy instruction, and believed their students benefit from explicit and systematic instruction.

4.1 Implications for Practice and Recommendations

Schools may increase teachers' agency and improve teachers' ability to effectively implement handwriting instruction through the a series of actionable steps outlined below.

4.1.1 District-Level Steering Committee

Schools should coordinate a district-wide steering committee dedicated to all facets of handwriting. This proposed committee, comprised of representatives from general and special education, should conduct a district-level program evaluation related to curricula, training, strategies and scaffolds, the handwriting process, and foundational handwriting skills, including handwriting practices. Such a committee might use the findings of this study to: (a) identify the specific training needs of teachers related to writing; (b) adopt an evidence-based writing curriculum that incorporates handwriting or adopts supplemental handwriting materials; (c) codify instructional strategies and tiered supports for writing; (d) develop clear priority statements outlining teacher roles and responsibilities related to handwriting instruction and aligned with student learning objectives per grade level; and (e) mandate district-wide implementation of evidence-based writing practices.

4.1.2 Adoption of an Evidence-based Handwriting Curriculum and Train Teachers

School districts should adopt and purchase an evidence-based writing curriculum that includes handwriting-- or includes supplemental handwriting materials aligned with state standards. This curriculum, including implementation guides, tools, and printed and digitized resources, should be provided to every teacher who is responsible for ensuring students achieve foundational writing skills. Likewise, teachers should receive student materials (e.g., writing implements, workbooks, alphabet strips, specially lined paper) for each student in their classrooms. As students move from grade level to grade level, teachers should use consistent guidelines and language regarding letter formation and handwriting, thus building on past instruction.

Schools should offer training on the adopted handwriting curricula according to publisher guidelines to ensure fidelity of implementation--or if they choose to use campus- or district-created materials, a clear plan for implementation should be developed and incorporated into such training. As previously mentioned, new and reassigned teachers benefit from targeted instruction on implementing literacy instruction and incorporating the chosen curricula into that instruction would help ensure success on the parts of both teachers and students.

4.1.3 Follow-up Coaching and Video Exemplars

Schools should offer follow-up coaching and training specific to handwriting to all instructors who are involved with early-literacy programs. As indicated by the findings in the research, educators, regardless of certification pathway, receive very little preservice training on handwriting instruction. As such, schools would be wise to provide on-going support for early-literacy teachers, and they may also wish to provide scheduled opportunities for less-skilled teachers to observe more-skilled ones as they implement handwriting instruction, thus allowing the observers to see how implementation of effective routines, strategies, and scaffolds supports struggling students.

Schools should compile videos of teachers who demonstrate effective instructional practices related to all components of literacy and can make these videos available on-demand to teachers new to either the institution or to their grade level, as well as existing teachers who could benefit from observing exemplar instruction in practice. Videos specific to manuscript and cursive instruction, including modeling and instructional feedback, should be prioritized.

4.1.4 Dialogic and Collaborative Planning

Schools should promote collaboration between general-education teachers, special-education teachers, literacy specialists, and occupational therapists regarding handwriting. Dialogue among those groups and with occupational therapists might provide valuable insight into strategies and scaffolds to support student mastery of handwriting, make recommendations about the integration of technology to assist writing development. Literacy specialists can provide additional guidance in using handwriting as a tool to build and reinforce early reading and spelling skills. Finally, the two kinds of therapists can also partner to develop training at the grade, campus, and district levels that builds teacher capacity to support student success aligned with state standards. Ensuring teachers have the training and skills needed to help students develop legible handwriting promotes equitable outcomes for all students.

5.0 Future Research and Concluding Thoughts

Based on the study’s findings, future research is recommended to investigate handwriting instruction at the preservice level, the teacher level, and the student level. Further investigation of EPP instructors’ knowledge of handwriting—and their attitudes towards it—is warranted. Additionally, a review of professional resources available for handwriting training during preservice is suggested, as is, consideration of how educational leaders serving EPPs, and PK-12 schools can improve and coordinate efforts to prepare teachers. Both prior investigations and the responses during this study’s qualitative phase indicate, handwriting difficulties are prevalent among elementary-school students (Donica et al., 2012; Puranik & Al Otaiba, 2012; Reutzell, 2015), and an examination of how schools plan for and implement supplemental instruction within a continuum of tiered services is thus recommended. Lastly, as the reality of school closures and remote learning challenge educators during the COVID-19 pandemic, the author suggests further study on how to best support the development of students’ foundational language skills during virtual instruction.

5.1 Concluding Remarks

It seems inequitable and unethical to ignore teacher preparedness to provide early literacy instruction. All students, regardless of zip-code or school district, should have access to highly trained, qualified teachers, knowledgeable and skilled in the providing evidence-based literacy instruction. Because students lose valuable learning time when they receive poor instruction, educational agencies at all levels, from local to national, should partner with educator-preparation programs to ensure newly matriculated teachers are well-prepared to provide effective literacy instruction from day one of their teaching careers. This shift in thinking requires educational leaders across PK-12 and higher education institutions to partner, review, and evaluate educator-preparation programming, in-service professional development, the purchase and implementation of curricula and instructional materials, and teacher readiness to provide literacy instruction to a diverse group of young learners.

Although some may view handwriting as archaic, boring, or even unnecessary, classroom and cognitive research reveals a very different story: handwriting is an integral component of fluent literacy. For this reason, districts and schools would be wise to consider handwriting as a key component of early literacy instruction, and preservice instruction and on-going professional development should include training on instructional routines and scaffolds that best support student development of handwriting proficiency.

Table 1

Descriptive Statistics for Relative Agreement with the six Statements

Statistics

Variable	N	N*	Median	IQR	Mode	N for Mode
My educator preparation program adequately prepared me to provide handwriting instruction	95	0	2.0000	1.0000	2	48
My educator preparation program included strategies for incorporating handwriting instruction into the overall curriculum	95	0	2.0000	1.0000	2	45
My educator preparation program prepared me to support children who are struggling in the area of handwriting (i.e., intervention, adaptations, or modifications)	95	0	2.0000	1.0000	2	45

My educator preparation program provided me training on how to teach posture as a component of handwriting instruction	95	0	2.0000	1.0000	1	40
My educator preparation program provided me training on how to teach paper placement as a component of handwriting instruction	95	0	2.0000	1.0000	2	39
My educator preparation program provided me training on how to teach pencil grasp as a component of handwriting instruction	95	0	2.0000	1.0000	2	39

Table 2*Frequency Table for Primary Handwriting Curriculum*

Variable	n	%
Primary Handwriting Curriculum		
D'Nealian	4	6.45
Handwriting without Tears	26	41.93
Other curriculum not named	26	41.93
Teacher-developed curricula	1	1.61
Universal Publishing	1	1.61
Zaner-Bloser	4	6.45
District-developed curricula	0	0.00
Campus-developed curricula	0	0.00

Note. Due to rounding errors, percentages may not equal 100%.

Table 3*Descriptive Statistics for Relative Disagreement with the Three Statements***Statistics**

Variable	N	N*	Q1	Median	Q3	IQR	Mode	N for Mode
Handwriting is an important component of early literacy instruction	95	0	4.0000	4.0000	4.0000	0.0000	4	74
Students benefit from explicit and systematic handwriting instruction	95	0	4.0000	4.0000	4.0000	0.0000	4	78
Handwriting instruction is unnecessary because of our reliance on technology.	95	0	1.0000	1.0000	2.0000	1.0000	1	56

Table 4*Descriptive Statistics for Relative Agreement and Disagreement with the Three Statements***Statistics**

Variable	N	N*	Median	IQR	Mode	N for Mode
I feel prepared to provide handwriting instruction in a virtual format	94	1	2.0000	2.0000	2	38

Student handwriting proficiency will be negatively impacted by COVID-19	94	1	3.0000	1.0000	3	45
My school has provided resources, strategies, and tools for me to use to support students with handwriting in a virtual setting	94	1	2.0000	2.0000	2	39

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