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EFFECTIVENESS OF COLLABORATIVE HANDWRITING CURRICULUM: HANDWRITING WITHOUT TEARS AND ORTON- GILLINGHAM, IN KINDERGARTEN CLASSROOM SETTING.

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EFFECTIVENESS OF COLLABORATIVE HANDWRITING CURRICULUM:
HANDWRITING WITHOUT TEARS AND ORTON-GILLINGHAM, IN KINDERGARTEN
CLASSROOM SETTING.

Presented in Partial Fulfillment of the
Requirements for the Degree of
Doctor of Occupational Therapy

Eastern Kentucky University
College of Health Sciences
Department of Occupational Science and Occupational Therapy

Merry Grace Harper, MS OTR/L
2021

**EASTERN KENTUCKY UNIVERSITY
COLLEGE OF HEALTH SCIENCES
DEPARTMENT OF OCCUPATIONAL SCIENCE AND OCCUPATIONAL THERAPY**

This project, written by Merry Grace Harper under direction of Julie Duckart, Faculty Mentor, and approved by members of the project committee, has been presented and accepted in partial fulfillment of requirements for the degree of

DOCTOR OF OCCUPATIONAL THERAPY

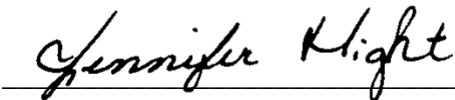
CAPSTONE COMMITTEE



Faculty Mentor

12/2/2021

Date



Committee Member

12/2/2021

Date

**EASTERN KENTUCKY UNIVERSITY
COLLEGE OF HEALTH SCIENCES
DEPARTMENT OF OCCUPATIONAL SCIENCE AND OCCUPATIONAL
THERAPY**

Certification

We hereby certify that this Capstone project, submitted by Merry Grace Harper, conforms to acceptable standards and is fully adequate in scope and quality to fulfill the project requirement for the Doctor of Occupational Therapy degree.

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Executive Summary

Background: Formal handwriting instruction, using evidence-based, developmentally appropriate handwriting programming, in school based occupational therapy is necessary to support the role of a student. Handwriting is an occupation of children in the school environment. Without formal handwriting instruction in place there is evidence to support occupational therapy intervention providing a handwriting program can improve handwriting success.

Purpose: The purpose of this research study is to determine the clinical efficacy of a hybrid approach to handwriting instruction pairing the Handwriting Without Tears and Orton-Gillingham instructional programming for prewriting and handwriting skills in the kindergarten population. The research question addressed is: Will a hybrid intervention approach and collaborative efforts of the occupational therapist with the classroom teacher be effective in producing better handwriting outcomes vs. the traditional approach in the classroom setting?

Theoretical Framework. The Model of Human Occupation guided this research to understand volition and environmental factors of teachers, students, and parents to determine the extent in which these factors influence the occupational change.

Methods. A quantitative pretest/posttest design was utilized for this study. The Screener of Handwriting Proficiency-Kindergarten was administered pre and post, to a convenience sampling of kindergarten students to establish a baseline of prewriting and handwriting skills, followed by direct intervention each week and home reinforcement ideas for the parents to utilize. Several times weekly, the occupational therapist collaborated with the classroom teacher regarding needs and progress of students.

Results. The results revealed an extra-large effect size noted for both groups in the area of letter memory. For students with IEPs there was an extra-large effect size for letter memory and medium effect size for letter placement and size. Based on the data analysis of the pretest and posttest screeners it was determined that statically significant changes were not seen overall in this study. Despite not achieving statically significance there were clinically relevant changes noted via clinical observation in students writing outcomes.

Conclusions: Positive clinical outcomes were seen as a result of this study for children with IEPs within the intervention group, as well as positive teacher and student interactions with the OT. This study has opened the door for more open communication and changes for the school districts attention to handwriting instruction. Teachers across the district have also begun to inquire about handwriting instruction strategies; based on such a high request the district has asked the OT department to develop and present a professional development for our teachers at the beginning of the 2022-2023 school year.

Acknowledgements

The completion of this Capstone Project would not have been possible without the support of my family and faculty and staff at ECU. I first want to thank my loving husband, Tyler, for his endless encouragement and support throughout my Capstone and OTD journey. I could not have made it without him pushing me to do my best every step of the way and his extra support at home as we gave birth to our first daughter, Leela. I would also like to thank Dr. Julie Duckart and Dr. Jennifer Hight, my capstone mentor and capstone committee member for their knowledge and insight throughout my research project. I have learned so much from these amazing Occupational therapists and have been inspired even more to pursue my dreams of being a professor one day. Lastly, I would like to thank my peers in the OTD program for all of the knowledge, experience, and expertise they have share with me over the past two years, I am a better OT for knowing each of you.

**EASTERN KENTUCKY UNIVERSITY
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DEPARTMENT OF OCCUPATIONAL SCIENCE AND OCCUPATIONAL THERAPY**

CERTIFICATION OF AUTHORSHIP

Submitted to (Faculty Mentor's Name): Julie Duckart

Student's Name: Merry Grace Harper

Title of Submission: Effectiveness of collaborative handwriting curriculum: Handwriting Without Tears and Orton-Gillingham, in Kindergarten Classroom setting.

Certification of Authorship: I hereby certify that I am the author of this document and that any assistance I received in its preparation is fully acknowledged and disclosed in the document. I have also cited all sources from which I obtained data, ideas, or words that are copied directly or paraphrased in the document. Sources are properly credited according to accepted standards for professional publications. I also certify that this paper was prepared by me for this purpose.

Student's Signature: Merry Grace Harper OTR/L

Date of Submission: 12/1/2021

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Section I: Nature of the Problem/ Problem Identification

Handwriting instruction provides a firm foundation in development and learning and equipping the student for academic achievement. Kindergartners spend 36-66% of their time engaging in fine-motor and up to 42% of that time they are using pencil and paper (Fogo et al., 2020). With the increasing amount of time our kindergartners are spending performing pencil and paper tasks it is important to teach them how to correctly perform these tasks and establish pre-writing and writing proficiency. As the academic demands for our kindergartners increase the writing curriculum demands have not changed, resulting in increased referrals to occupational therapy for handwriting intervention. Some students in kindergarten demonstrate delays in gross or fine motor skills impacting their ability to participate in the general education setting thus indicating the need for occupational therapy services.

Handwriting concerns are the top reason for referral to a school based occupational therapist (Case-Smith, et al. 2012). When assessing a student's handwriting occupational therapists are looking at a variety of components. Some of these include motor skills, positioning while seated, muscle tone, visual motor, visual perception, letter formation, letter placement, letter size, letter spacing, and letter orientation. Based on the numerous components that factor into a student's ability to write, it is important to remember collaboration is vital to our students' success (Bradley, et al., 2020). Schools in the state of Alabama have required reading and math curriculum; however, there is no standard handwriting curriculum. The reading curriculum used in this district the study was completed is Orton-Gillingham (OG), (*Orton-Gillingham Academy*). This reading program is phonics based, multisensory, and uses a specific type of paper for writing. Teachers in the district follow the OG letter progression that is outlined in Appendix C. Each Monday teacher have a multisensory reading block where letters are introduced. During

this time OG strategies are utilized. Many teachers use additional strategies from Bloom and Traub's (2005) book, *Recipe for Reading*, to assist with additional instruction for children in tiered intervention groups. Each teacher utilizes multisensory strategies to reinforce reading skills. Each intervention strategies varies depending on the classroom and child's needs; however, some of these skills include writing in sand trays, air writing, and other kinesthetic learning strategies.

The lack of writing curriculum leads to teachers developing their own strategies for teaching handwriting and many times these approaches are not evidence based and for the duration of this paper will be referred to as the "traditional approach". The lack of consistency in one district creates difficulty for the students as they progress to higher grades due to the lack of consistent verbiage for specifically how letters are formed. Marr and Cermak (2003) completed a longitudinal study on students from kindergarten to 1st grade evaluating handwriting consistency. This study directly measured handwriting performance as they aged. In this study it was determined that children scoring in the low group in kindergarten were consistent in scoring in the low group in 1st grade. This study raised the question regarding the need or benefit for early intervention in K to assist in closing the gap and improving handwriting scores. This study helps to support the need for Occupational therapists early in kindergarten to assist with handwriting concerns.

Handwriting interventions vary depending on the therapeutic approach being used or program being followed; however, it is best practice and evidence based to utilize developmentally appropriate, multisensory strategies. Handwriting Without Tears (HWT) is the program the occupational therapists and special education teachers follow in the district the study was completed in. Handwriting without Tears is an evidence-based program that following the

developmental progression of pre-writing and writing skills. Letters are introduced in a particular order to follow writing strokes. Children are taught positional concepts, specifically that letters start at the top, utilizing a developmentally appropriate, multimodal approach, to accommodate various learning styles. Wooden pieces are used to build letters on letter cards and chalk boards for practice with letter formation which target a kinesthetic learning style. Specific and fun verbiage is used to teach children how to write their letters from top to bottom and left to right, which follows the same pattern in which we read, which helps to reinforce appropriate visual scanning skills. This program utilizes a grade/age specific structure and is nicely laid out in a teaching manual for how and when to introduce letters and how to remediate skills as needed. This program is in vast contrast to what is thought of as the “traditional approach” teachers use in the classroom, as it was developed by an occupational therapist to target the multisensory, developmental levels of the learner. Most teachers use a variation of language of circles, sticks, lines, balls, bats; to form letters with no consistency across classrooms, grades, or the district and teach handwriting skills based off of what they know or find in their classroom works best. This approach is not evidence based.

With time limitations in the classroom setting and teachers concern for having to add another full curriculum to their day, the purpose of this program development and implementation is to develop a hybrid program combining OG and Handwriting Without Tears to achieve an occupational balance and improve the changes of longevity of implementation and buy-in from teachers and district coordinators. This hybrid approach will follow OG letter progression based on phonics and strategies from HWT to teacher the writing components.

Generally, there is evidence that OT services and intervention are beneficial in the school setting to assist with improving handwriting and fine motor skills. Whether direct, consultative,

or nontraditional occupational therapy intervention methods, intervention has been found across all studies to be perceived as beneficial and there is data to support a growth and increase in handwriting performance among children in the school setting when receiving intervention (Zylstra et al., 2016).

Nye and Sood (2018) completed a phenomenological study, interviewing teachers regarding their views on handwriting intervention. This study reported a lack of handwriting curriculums, training, access to occupational therapy services, knowledge regarding handwriting assessments, and need for collaborative service delivery model to support the needs of students by teachers reporting this is an area of concern in the school setting. This validates the need for teachers buy-in and motivation to make changes in curriculum and to support the academic needs of their students. Collaboration with general education teachers is not common in the district this study was conducted although best practice suggests this to be the standard; however, collaboration with special education teachers and inclusion teachers is more common. Although collaboration with special education and inclusion teachers is more common it is often not primary in the efforts of the occupational therapist and most of the focus is on direct services. Donica (2015), discussed the importance of collaboration and the positive impacts on handwriting performance, thus indicating increased time collaborating with our teacher would likely produce positive handwriting outcomes. Teachers in this district were asking for assistance in developing and implementing handwriting teaching approaches. Teachers identify difficulty remediating handwriting instruction and individualizing handwriting instruction for children that are not able to understand or keep pace with the typical classroom instruction, this gives occupational therapists a unique opportunity to step in and provide education and evidence-based approaches to benefit handwriting instruction.

Needs Assessment

A needs assessment was conducted using a survey of special education and general education kindergarten teachers to determine perspective, needs, and barriers to the current teaching practices surrounding handwriting in a Central Alabama public school district. Nine elementary special education teachers responded to this survey, and it is worth noting the teachers who responded were not on contract when the survey was administered. Most teachers are under a 9-month contract and have summers off, when this survey was administered the teachers that responded were off work and not required to check or respond to work related emails or messages. The needs assessment identified that the teachers were willing to collaborate with the occupational therapy team and were open to ideas regarding interventions in the classroom setting. Teachers identified time, knowledge, training, and lack of curriculum as barriers to the current academic content and handwriting curriculum. One strength they identified was that they were generally satisfied with the curriculum, and overall occupational therapy supports in place. Based on the needs assessment results, it is likely to be beneficial to the teachers, and students to implement handwriting intervention that complements the current reading program the district uses, which is Orton-Gillingham. Through the hybrid intervention approach the occupational therapist was able to assist with identifying needs and making modifications for teachers to implement in the classroom setting.

In summary, the teachers at a Central Alabama public school district identified a need for additional training and assistance with combining their current reading curriculum and direct handwriting instruction. Based on the needs assessment and the review of literature it was determined that developing a training for teachers and measuring the effectiveness of the training

via a collaborative approach in a kindergarten classroom would be an important and impactful project to benefit the occupational therapy profession, teacher, students, and the school district as a whole.

Problem Statement

The problem this capstone project will address is the lack of use of a uniform handwriting curriculum and consistency of handwriting language in the kindergarten classrooms in a Central Alabama public school setting.

Purpose Statement

The purpose of this capstone was to explore and measure the effectiveness of a collaborative handwriting program and impacts it may have, if any, on the overall handwriting progress of our general education, special education, and at-risk students. The curriculum consisted of a collaborative approach where the occupational therapist provided a short ten-minute direct whole group instruction with the classroom teacher, introduced a center activity, and sent a home activity for each week of the study.

Research Questions

Will a collaborative intervention approach between the occupational therapist and the classroom teacher using a combination of OG and HWT be effective in producing better handwriting outcomes vs. the traditional approach in the classroom setting?

Theoretical Framework

Consistency across instruction as well as understanding the developmental progression of prewriting and writing skill was an important consideration for this study. Another consideration was the driving theory for the study, the Model of Human Occupational (MOHO) (Taylor, 2017). MOHO is a theory that helps to understand how we interact with our environment,

perform our occupations, and how all of these factors are intertwined to make changes. There is the internal system which is comprised of the following: Volition, habituation, and performance. All of these areas produce outcomes which impact the individual and environment causing adjustments to be made to produce change. Student motivation and teacher occupational balance to ensure carry over for the instruction throughout the week and school year was a vital factor that was being monitored in the system. This theory assisted in the development of the programing for this capstone. The programing was developed so that children would have fun and that activities would be centered around play based strategies and that everything would be easy and efficient to implement on the teachers end to ensure buy-in and carryover once the occupational therapist was out of the classroom. Based on the information obtained through the literature review and needs assessment this capstone project was significant in determining the impact for students in our district as well as assisting teachers with the ease and ability to integrate consistent handwriting instruction with their current reading standards. This capstone is foundational in building a standard for our children and teachers in our school district.

Significance of the Study

This project was significant in determining the effectiveness of a collaborative OG and HWT programing approach to handwriting success among kindergarten children in the public-school setting. There is ample evidence to support the use of the HWT and OG interventions for handwriting success. However, according to the needs assessment completed, many teachers struggled to find time to fully implement handwriting instruction within their school day and curriculum demands. The intentions of this collaborative approach will allow teachers an easier way to intertwine handwriting intervention/teachings within the current curriculum demands and continue to improve handwriting of all children in the classroom. This study will help shape and

change how services are administered to children in the kindergarten classroom setting by moving to a more collaborative approach. The expectation prior to completion of this study is that it will lead to increased carryover in the classroom setting throughout the week and potentially decrease kindergarten occupational therapy referrals. By changing service delivery, it will in turn impact the school districts' policy and referral process for occupational therapy evaluations among kindergarten aged students, but most of all increase handwriting performance for students to support successful academic engagement. Throughout this entire study collaboration was a key component.

Operational Definitions:

- Collaboration can be defined in this study as the occupational therapist, special education teacher, classroom teacher, students, and parents working together to achieve a common goal of improving handwriting performance (Hanft & Shepherd, 2016).
- Common handwriting language was established. Handwriting language are the explanations and verbal directions given to the children on how to form each letter of the alphabet.
- A hybrid approach discussed and implemented in this study refers to the combination of the current OG reading curriculum with components of the HWT curriculum. This approach is how integrative handwriting programming was achieved as the two programs were used simultaneously to meet the districts standards for reading curriculum and begin the process of implementing a handwriting program.

Summary

In summary, handwriting in our kindergarten classrooms is an important area of focus for school-based occupational therapists. The increase of writing demands, lack of formal

curriculum, and time constraints identified by the teachers surveyed indicate the need for further occupational therapy intervention and education. The OG reading curriculum utilized some positive components that support handwriting development via the multisensory component; however, it lacks language for letter formation. The combination of OG and HWT strategies is hypothesized to meet the district reading standards as well as integrate handwriting strategies and methods to bridge the gap in handwriting instruction. Evidence supports handwriting instruction, collaboration with teachers, and OT intervention delivered via direct and consultative methods (Case-Smith, et al, 2012; Nye & Sood, 2018; Seruya & Garfinkel, 2020). These areas will be discussed in further details in the literature review below.

Section II: Literature Review

This is a literature review that covers the following topics: Handwriting, handwriting curricula, collaboration, occupational therapists' role in handwriting, and handwriting intervention programs. The following data bases were utilized in the search: CINAHL complete, *American Journal of Occupational Therapy*, EBSCOhost, Google Scholar, Nursing & Allied Health Premium, and Wiley Online Library. Below are four topics explored through this literature review.

Lack of Emphasis on Handwriting in Current Academic Curricula

Caraia, et al. (2020) discuss the ever-changing curriculum standards within school systems in the United States. This study specifically found that students from kindergarten to second grade spend on average 36% more of their time performing writing tasks than students in higher grades. This large amount of writing specific time suggests the importance of handwriting in the overall school curriculum.

Nye and Sood (2018) completed a phenomenological study, interviewing teachers regarding their views on handwriting intervention. This study reported there is a lack of handwriting curriculum, training, access to occupational therapy services, knowledge regarding handwriting assessments, and need for collaborative service delivery model. This validates the need for teachers buy-in and motivation to make changes in curriculum.

In another study, Asher (2006), investigated K-6th grade teachers to determine what is being used in the classroom setting for handwriting instruction, what tools teachers are utilizing in the classroom and what letter progression is being taught. This study found that there is no continuity between classrooms or teachers in this school district. The author indicated teachers began handwriting instruction and referred to occupational therapy when a child was struggling

vs. attempting remediation on their own. This was a qualitative study therefore these results are not generalized, but its findings suggest that continuity in handwriting teaching may be important to the development of this important skill. This study was included in the literature review to show the lack of consistency seen across other school districts handwriting instructional methods.

Collaboration

Collaboration can be defined as the action of working together, as a team, to produce or create something. As occupational therapists this is critical to our intervention approach. Nye & Sood (2018), completed a phenomenological study in a school district in Illinois. The semi-structured interviews were completed with nine kindergarten teachers among four different elementary schools. The authors verbatim transcribed the interviews and coded them. After both authors completed coding there were four overall findings reported. It is reported there is a lack of handwriting curriculum, training, access to occupational therapy services, knowledge regarding handwriting assessments, and need for collaborative service delivery model. This study provides information from teachers' perspectives with regards to handwriting intervention and confidence and perception regarding current models. Despite limited generalizability of this study, the needs assessment completed indicated a similar perspective of teachers in Alabama.

Bradley, et al (2020), discusses collaboration between teachers and occupational therapists. This study completed a survey gathering qualitative data on teachers' perception of collaborating with an occupational therapist in the school system setting. This study indicated 85.1% of teachers value collaboration with their occupational therapist and 89.4% felt that occupational therapy intervention was effective. This study also indicated some teachers do not understand the role of occupational therapy in the school setting, which could limit effectiveness of

collaboration. Overall, collaboration and education regarding our roles as occupational therapists is invaluable.

Lastly, Case-Smith, et al. (2012), discussed the role of coteaching in 1st grade. This program was implemented for 12 weeks, and a pretest, posttest, and 6-month follow up was completed by administering the Evaluation Tool of Children's Handwriting-Manuscript and the Woodcock-Johnson Writing Fluency and Writing Samples tests. This study found that students with low legibility initially improved the most in the area of legibility. Overall, this study shows that working together with classroom teachers is effective in improving a students' handwriting performance.

Occupational Therapy's Role in Handwriting

Handwriting is complex, involving multiple functions to occur at one time, from how a child is seated and positioned, how they hold their pencil, and how their eyes process what they are seeing can impact handwriting performance. As an occupational therapist, it is important to complete a task analysis of each child as they write to determine strengths and weaknesses and treat each underlying component that may be impacting their handwriting performance. According to AOTA (2021), it is within occupational therapy's scope of practice to assess the following components that impact handwriting performance, posture, strength and stamina, visual and perceptual ability, to help develop and evaluate handwriting curriculums, collaborate with teachers, and suggest home activities.

Seruya & Garfinkel (2020) explored the idea of workload and case load in school based practice. This study was completed by an online survey and the results indicate that there was a lack of support to move to a workload model. Caseload would be defined as the students that directly receive occupational therapy services as a part of their IEP or 504 plans, and workload

would encompass everything from consulting with teachers about struggling students, developing therapy plans, evaluations, etc. This study also made note that school-based occupational therapists are continuing to provide services outside of the classroom setting and other natural environments despite best practice. This study emphasized the importance of advocating for our profession to make positive changes to better serve our children and teachers.

To conclude, part of an occupational therapist's role and handwriting is to assess grasp patterns. Schneck (1991) discusses that children with handwriting difficulties demonstrate poor or less mature grasp patterns and demonstrate mixed hand preference rather than a dominant hand while writing. This lack of hand preference can lead to poorer writing outcomes in children. By assessing grasp patterns in young children this will help to assess writing readiness and potential points of remediation for children and areas to strengthen. This is an importance consideration when implementing a writing program and teaching handwriting skills.

Handwriting Intervention Programs

Handwriting Without Tears (Learning without Tears, 2018) is a formal, research based, handwriting program sold by Learning Without Tears. This program follows the developmental progression of writing by presenting letters beginning with vertical lines, horizontal line, followed by curves and slanted lines. This program incorporates multisensory strategies for writing, songs, and movements to teach writing concepts. This program is widely discussed in the literature and the following articles discuss the effectiveness of this program as well as others in the kindergarten setting.

In a study completed by, Donica (2015), the effectiveness of Handwriting without Tears in the kindergarten setting via a consultative approach was completed to determine the impact on students handwriting performance. This study administered the Test of Handwriting Skills-

Revised (Milone, 2007) to determine outcomes. The students in the intervention groups were found to outperform the control groups, scoring significantly higher in all areas. This study supports the role of occupational therapy in handwriting intervention, the formal program of Handwriting Without Tears, and a collaborative approach to treatment.

Marr and Cermak (2003), completed a longitudinal study and followed 93 kindergarten (K) students from K-1st grade from the upstate New York area. This study sought to determine consistency of handwriting from K-1st grade, and previous research showed inconsistencies in older children. The Scale of Children's Readiness in Printing (SCRIPT) (Weil & Amundson, 1994) was administered pretest and posttest. This study determined moderately consistent patterns of handwriting performance in young children. There was not much diversity in the sample and consisted of mostly middle class, Caucasian children. It should be noted that there was less consistency in the lower group as this is likely the population of children most likely to get an OT consult in the school district. This study is applicable in ensuring thought is given to the referral process at such a young age and how we can best modify current curriculum or implement new curriculum to best meet the needs of all students.

The Size Matters Handwriting Program (Zylstra & Pfeiffer (2016) was implemented by occupational therapists in a school district in Washington State. This study indicated that students that are at risk benefit from OT intervention and the use of a handwriting program. Additionally, The Write Start program was studied by Ray, Dally, and Lane, (2021). This study implemented the Write Start program in on school and used another school as a control group. This study had a large sample size and results indicate that implementing a writing program had positive impacts on a child's writing and reading performance. This study was important as it

discussed the importance of a program, utilizing support in the classroom setting, and a collaborative approach. Overall, this study found the Write Start program to be effective.

Lastly, Randall (2018) studied kindergarteners and the use of HWT. The outcome measured used was The Print Tool. This study focused on OT collaborative intervention and resulted in improved handwriting outcomes for the students in the study. 70% of the students showed an increase in lowercase letter legibility. Teachers reported positive outcomes of the study with the one drawback being the double line paper that the program uses.

Summary

This study of the existing literature provided background information and knowledge needed to develop and implement a focused intervention approach for kindergarten students with a focus on handwriting performance outcomes. The lack of curricula, collaboration, Occupational therapists' role in handwriting, and intervention programs were explored through this literature review. As a school based occupational therapist, it is important to consider the barriers identified in each study how they may potentially impact an intervention approach. From the literature review it is evident that handwriting intervention works, whether direct, indirect, collaborative, or consultative. Based on this research, developing a client centered and evidence-based intervention approach was possible and has helped to shape the children and the local school district.

Section III: Methods

The objective of this capstone project was to determine the effectiveness of a hybrid handwriting approach using OG and HWT in the kindergarten classroom setting. The following research question was addressed: Will an OG and HWT hybrid intervention approach with collaboration between the occupational therapist and the classroom teacher be effective in producing better handwriting outcomes vs. the OG and no collaboration in the classroom setting? The dependent variable, handwriting performance, was measured using The Screener of Handwriting Proficiency (Learning Without Tears, 2021).

Research Design

This research project was a quasi-experimental quantitative study and consisted of pretest and posttest evaluation measures to determine effectiveness of intervention. A multisensory handwriting intervention was implemented and measured. The experimental group consisted of children in a kindergarten classroom using HWT and OG programs. The control group consisted of a kindergarten classroom only using a traditional approach, and the OG program. Randomization was not possible as these were pre-established classes of kindergarteners as a sample of convenience. The teachers for the study were chosen based on willingness to participate in the study.

Setting

The school district in which this project was implemented is a small public school, city system. Two occupational therapists serve the entire district and collaborate extensively with each other and teachers. In this practice setting children with a variety of diagnosis including autism, developmental delay, angel man's syndrome, sensory processing disorder, attention

disorders, and other mental health diagnosis receive OT services. In kindergarten, a collaborative approach is used for early identification of students with special needs.

Ethical Considerations

IRB approval was obtained from Eastern Kentucky University prior to conducting the study (see Appendix A). Further, a letter of support was obtained from the school district (see Appendix B). Inclusiveness was an important factor for participation in the programming. All children were included as stated in the inclusion and exclusion criteria. Regardless of ability level each child participated in the formal assessments and intervention; however, if they did not meet the inclusion criteria their data was not included for analysis. Each child's wellbeing was considered and at any sign of distress the intervention was stopped or modified to meet each child's specific need. Each child received verbal praise and positive reinforcement to ensure overall wellbeing throughout the study. For example, when having to recall letter from memory some children became anxious as evidence by their verbal expressions and the child was shown how to write the letter. This was noted by the OT so that the screener was scored appropriately.

Outcome Measure

The Screener of Handwriting Proficiency (Learning Without Tears, 2018) was used as the evaluation tool to measure handwriting performance pre and post intervention. This screener is a free screener from Learning Without Tears specifically designed for kindergarten aged children. This screener was chosen due to convenience and due to the fact that it is used commonly throughout school based practice as an OT. The screener is not norm referenced. The scores obtained by the screener are error-based scores, therefore, a decrease in scores on the posttest indicate improvements. Error based scores add to clinical observations within school based practice by Occupational therapists. By administering the screener, student's ability to

write capitals, numbers, lowercase letters from memory are assessed. The following four specific handwriting components are measured: memory, orientation, placement, and size. Students are asked to write the following uppercase letters, numbers and lowercase letters: O, F, W, B, S, K, N, R, 2-9, e, n, a, d, g, h, y, p. Based on the current literature reviewed for this study there is limited research including this assessment tool as an outcome measure.

Inclusion/ Exclusion Criteria

Inclusion criteria for this study included students who were currently in kindergarten at the Central Alabama elementary school. Exclusion criteria included students who were not currently enrolled in kindergarten and students who were unable to write for themselves or developmentally unable to use a writing utensil. Inclusion/ exclusion criteria were the same for both the control and intervention classrooms.

Recruitment

A convenience sample was used. Classrooms were chosen based on teachers' willingness to participate with OT for the duration of the study. Students were assigned to classes by the school administrators prior to the start of the school year. Another kindergarten classroom was selected at the same school as a control group. The intervention group was an inclusion classroom within a public city school district. The occupational therapist worked directly with the classroom teacher, special education teacher, students, and each child's parent/guardian.

Procedures

Current standard of practice for our kindergarten students is following the OG reading curriculum. This curriculum is a multisensory approach and introduces letters based on phonetics. Teachers provide this instruction daily. Handwriting Without Tears is a formal handwriting program that introduces letters based on the developmental progression for writing

strokes. The purpose of this study is to combine the two programs and determine the effectiveness with regard to handwriting outcomes. The researcher's professional role was to provide brief direct instruction to the class, as outlined below, and constant collaboration with the teacher regarding individual needs in the classroom. Data collection was done via pre and posttest method utilizing The Screener of Handwriting Proficiency. The pretest screener was administered in a whole group setting and the classroom teacher and OT monitored children's needs for assistance. Following the pretest administration, a 5-week intervention was completed. Intervention consisted of 5 minutes of direct whole group instruction for letter formation and then center activity introduction. Center activities are for independent centers or can be moved to the teacher table. For the duration of this study the activities were kept in child center rotations. Each week an idea for reinforcement was sent home for parents to utilize. Parent compliance was not monitored during the study. The teacher of the control group continued with her typical lesson plans and traditional handwriting instruction and did not collaborate with the occupational therapist for the duration of the study. The post-test screener was administered, and clinical observations were made. Following data collection, the data was analyzed. Students in the intervention group reviewed the intervention outlines below and students in the control group will receive standard kindergarten writing instruction. *Appendix C* shows an outline of the program utilized. For instruction each week the letter of the week was introduced to the whole class. Instruction focused on letter formation, then each center activity was introduced. An activity idea or work sheet was sent home by the OT each week for extra practice. Prior to letter introduction coloring activities and the pencil pick up song was introduced.

Data Analysis

Pretest and posttest data were analyzed using jamovi statistical analysis software, version 2.0 (The jamovi project, 2021). Jamovi is an open-source free statistical analysis package that conducts basis statistics such as descriptive statistics and tests of association such as t-tests. Alpha was set at $p \leq .05$ *a priori*. Paired t-tests were used to determine if there were significant differences between pretest and posttest scores. Independent t-tests were used to determine if there were significant differences between pretest to posttest change and IEP status.

Table 1: Timeline of the Project

7/1/2020	9/29/21	9/30/21	10/5-26/21	10/29/21	11/9/21
Needs Assessment Completed	IRB approval	Pretest screener Week 1 Intervention	Weeks 2-5 Intervention	Posttest Screener	Data Analysis

Summary

This study sought to develop and determine the effectiveness of a collaborative handwriting curriculum to address handwriting outcomes in a kindergarten classroom setting. This study was completed in the fall, with first semester kindergarten students. An OT provided direct and collaborative intervention in the classroom setting. This program was developed based on the current reading curriculum the school district utilizes, OG, and combine with an evidence based handwriting program, HWT. The combination of these two programs resulted in the program outlined above. IRB approval was obtained prior to completion of the study and data was analyzed following data collection and will be discussed in the next section.

Section IV: Results and Discussion

Introduction

Based on the data analysis of the pretest and posttest screeners it was determined that statistically significant changes were not seen overall in the study. In both the control and intervention group a statistically significant change in the area of memory was seen with an extra-large effect size. Students with IEPs were compared with students without IEPs, and it was similar in results; however, there were slightly larger gains in the area of letter memory for these children. This indicates that students with IEPs are keeping pace with their typically developing peers. As discussed previously a decrease in scores indicates a positive outcome. In the control group there was a decrease in memory and size; however, in the intervention group there was a decrease in memory, placement, and size. Overall, despite not achieving statistical significance there were clinically relevant changes noted via clinical observation in students writing outcomes. When observing students in the experimental group with OG and HWT, students were excited to engage in handwriting activities and verbally expressed that they were having fun with this program. The classroom teacher in the OG HWT group observed that students were engaged and having fun with the manipulatives and handwriting activities.

Results of evaluation of project objectives

The objectives of this research study were to determine the effectiveness of using HWT and OG strategies in kindergarten classroom setting and their impact on handwriting outcomes, determine benefits of collaborative approach with OT on a weekly basis, and gain further understanding of daily barriers that teachers face when combining reading and handwriting instruction.

The first objective regarding determining the effectiveness of the program was met based on the evidence of the clinical observation outcomes and student performance. The second objective, benefits of collaboration, was also met as teachers reported positive changes and outcomes of the program. There was also a request for increased OT collaboration in other classrooms during and after the study was completed. Additionally, when talking with the children in the class they had a positive experience and had fun. This was evident by their excitement displayed when the OT would arrive in class, or they would see the OT in the hallway. The children had fun with the new multisensory strategies implemented in the classroom setting and repeatedly requested “chalk” or wet, dry, try to be a part of their centers. Lastly, time for implementation was confirmed as a major barrier teachers faced during the study. Having the opportunity for direct OT instruction time was a huge benefit to the teacher and assisted with the time management component. Overall, all study objectives were met. General demographic data is summarized in Table 2. The number of students in this study were limited in size due to COVID absences. Both classrooms are inclusion classrooms; however, one teacher (intervention group) had more students on IEPs than the other teacher resulting in an unequal sample for comparison.

Table 2: General demographics

	Control Group	Intervention Group
Number of Students	14	14
Gender	8 Male	8 Male
	8 Female	8 Female
IEP	0	5

Table 3 summarizes the paired t-test of the HWT group (intervention). As noted on this table, no statistical significance was found in orientation, placement or size. There was statistical significance for memory. Table 4 summarizes the control group data, which demonstrates similar findings in comparison to the intervention group.

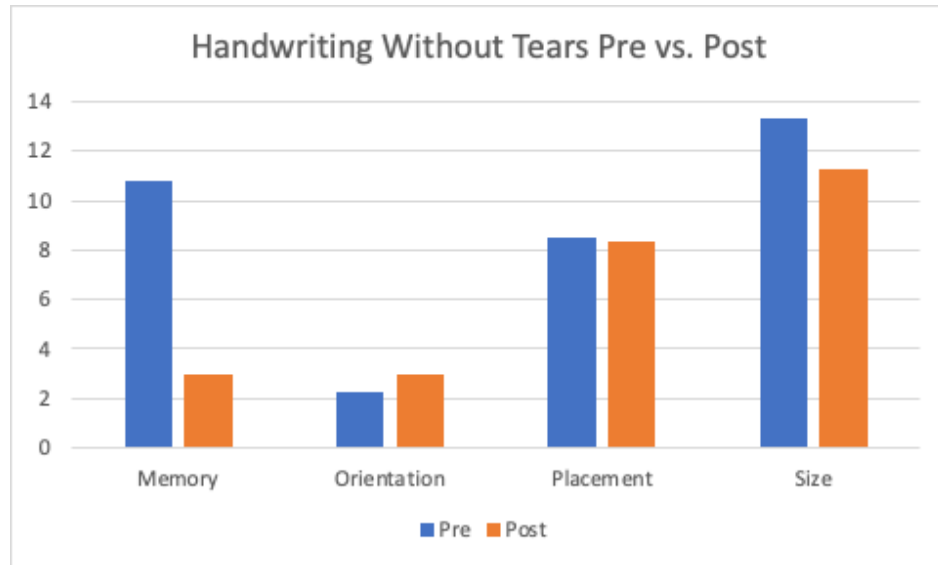
Table 3: Paired Samples T-test of HWT group

Paired Samples T-test of HWT group			
	Statistic	df	P
Memory	5.761	13.0	<0.001
Orientation	-1.422	13.0	0.179
Placement	0.107	13.0	0.916
Size	1.414	13.0	0.181

Table 4: Paired Samples T-test of control group

Paired Samples T-test of control group			
	Statistic	df	p
Memory	5.399	13.0	<0.001
Orientation	-0.102	13.0	0.920
Placement	-0.165	13.0	0.871
Size	0.159	13.0	0.876

Figure 1: Handwriting Without Tears Pre vs. Post



The intervention group showed positive results in the areas of memory, placement, and size. A score that decreases shows improvement in the area being assessed. There was a slight increase in the area of orientation, indicating that children on the post assessment demonstrated more errors in letter reversals. This data looks at the group as a whole and many students made gains in the area of orientation and a few students began to make more errors. Figure 1 presents the finding visually.

Figure 2: Control Group Pre vs. Post

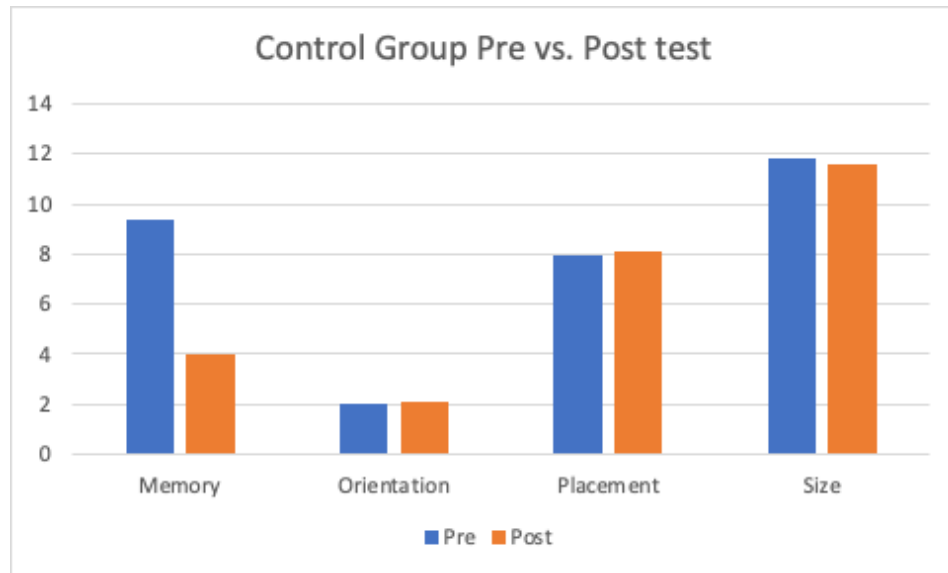


Figure 2 presents the visual findings of the control group. The control group showed positive results in the areas of memory and size. This group showed a slight increase in the score of placement and in the area of orientation their scores remained the same. A score that decreases shows improvement in the area being assessed.

Table 5: Paired Samples T-test for HWT group

Paired T-test for HWT group				
	Statistic	df	p	Effect Size
Memory	-5.399	13.0	<0.001	-1.4428 (xl)
Orientation	0.102	13.0	0.920	0.0273 (s)
Placement	0.165	13.0	0.871	0.0442 (s)
Size	-0.159	13.0	0.876	-0.0424 (s)

An extra-large effect size was seen in the area of memory for the HWT group and a small effect size in all other area. An extra-large effect size and a significant difference means that the OG HWT group greatly improved in their ability to write letters from memory during dictation.

Table 6: HWT by IEP

HWT: by IEP				
	Statistic	df	p	Effect Size
Memory	2.921	12.0	0.013	1.629 (xl)
Orientation	-0.250	12.0	0.807	-0.139 (s)
Placement	0.688	12.0	0.504	0.384 (m)
Size	1.177	12.0	0.262	0.656 (m)

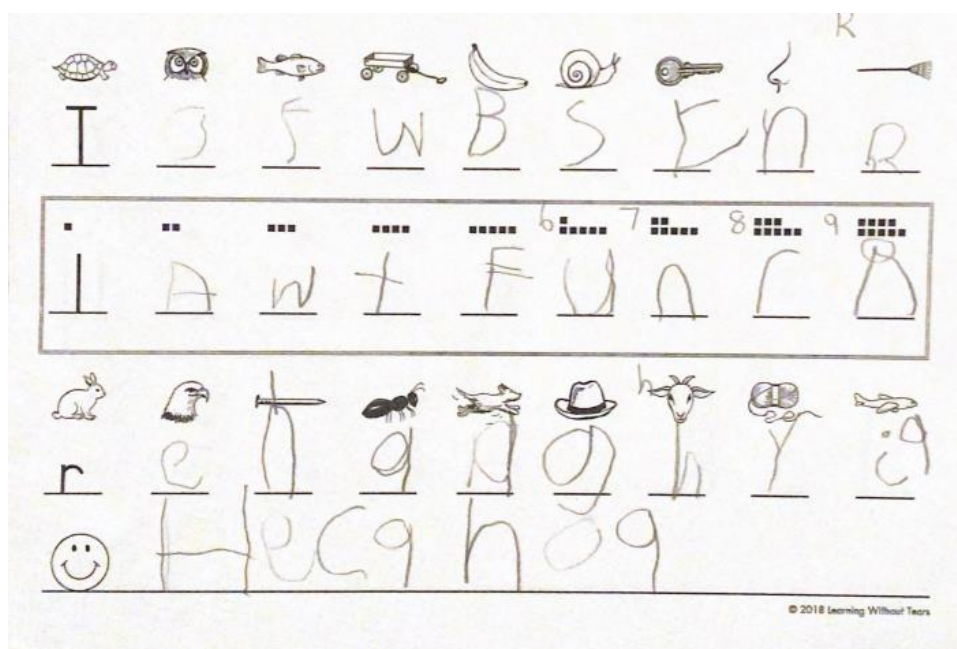
When comparing students with IEPs to their peers, there is an extra-large effect size and there is a slight increase in their memory scores indicating they performed slightly better and made more gains than their peers in this area. They also demonstrated a medium effect size for placement and size and small for orientation. Both the intervention group and control group made statistically significant gains in the area of memory; however, according to this data children on IEPs made slightly higher gains with letter memory when compared to their peers indicating they are keeping pace with their peers.

Table 7: Control and Intervention by IEP

Control and Intervention by IEP				
	Statistic	Df	p	Effect Size
Memory	3.524	26.0	0.002	1.744 (xl)
Orientation	-0.494	26.0	0.626	-0.244 (s)
Placement	0.832	26.0	0.413	0.411 (s)
Size	1.514	26.0	0.142	0.747 (m)

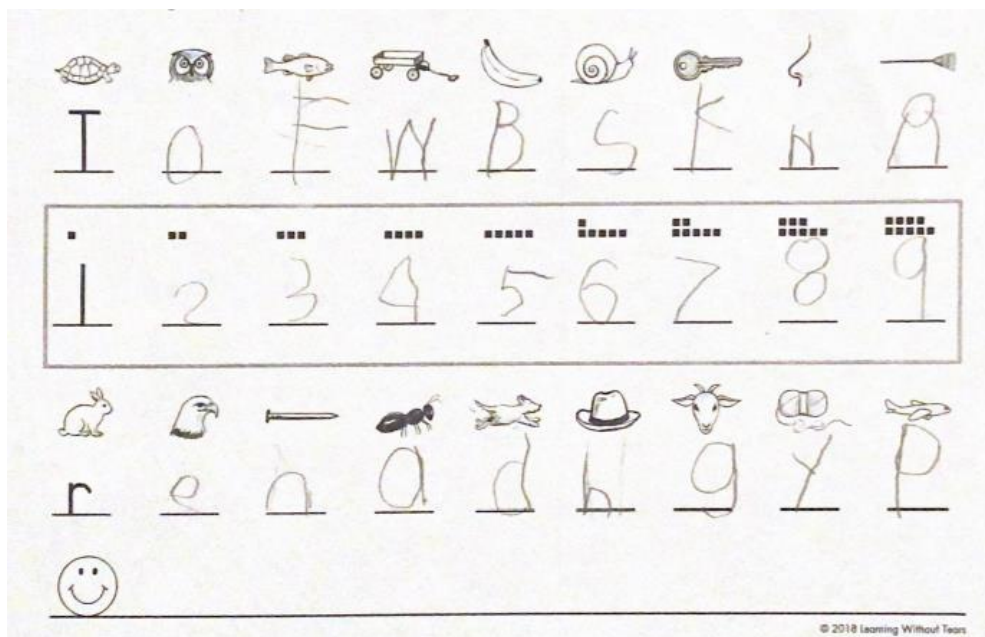
When comparing both groups of students to the IEP students, they were noted to have an extra-large effect size in memory and medium in size. They had a small effect size in the areas of orientation and placement. There was a significant improvement for IEP students in remembering their letters and making letters the appropriate size, and this group demonstrated great gains in this area than children without IEPs.

Figure 3: Pre-test Screener



This pre-test screener demonstrated a student who was unable to write their numbers. This student was also getting very frustrated when writing and was given a model and continue to write letters instead of numbers. This student also became frustrated when he did not know a letter. According to the screener guidelines you are unable to prompt a student; however, during the screener frustration was monitored for, and cues were given as needed and documented by the researcher for consistency in scoring.

Figure 4: Post-test Screener



This posttest screener shows tremendous progress from the students pretest screener. He was able to write all numbers independently from memory and showed significant progress with letter placement and orientation. Overall, this shows clinically relevant changes noted throughout all children in this study.

Discussion

Although statistical significance was not found in the handwriting performance areas evaluated between the control group and the intervention groups for the kindergarteners in this study, there are two interesting results that are worth of discussion. First, the teachers and the occupational therapist working with the children in the intervention group found an increase in overall legibility of handwriting, and, most notably, an enthusiasm to participate in the handwriting activities that were not demonstrated in the control group. Students in the intervention group were excited to participate in the handwriting groups, which will lead to

improved overall handwriting gains. Perhaps with a longer intervention period, there may have been a stronger effect size with significant results in the intervention group.

Second, children with IEPs within the intervention group made significant gains in letter size, placement, orientation, and memory were compared between the control group (OG only) and the intervention group (OG and HWT). When comparing students with and without IEPs, the students with IEPs made significantly more progress than students without IEPs. This was a surprising finding since this was such a short intervention and this group was not specifically targeted for the study. Our goal as Occupational therapists and special education providers is to assist our children with keeping pace, closing the gap, and making progress with their IEP goals. This gain in handwriting skills for children with IEPs helps us see that these are keeping pace with the typically developing peers in their cohort when using HWT approach to supplement their handwriting instruction. This finding is significant with the findings of Marr and Cermak (2003) that children receiving a structured handwriting curriculum in kindergarten receive benefits over those not in a structured handwriting program. One possible limitation to this finding is that all students with IEPs were in the intervention group, therefore there was the ability to evaluate if there were significantly different gains in handwriting performance in the participants with IEPs in the control group compared to the intervention group. The allocation of students to either the control group or the intervention group was made due to convenience sampling, therefore group demographics were not controlled by the researcher.

Statistical significance was not achieved when using the Handwriting Without Tears Screener between the control and intervention groups in this study, the classroom teacher and occupational therapist did see clinically relevant changes in the students' performance by observation of improvements in letter formation in the intervention (OG and HWT) group. This

finding supports findings by Marr and Cermak (2003), who found that there was an improvement in handwriting performance including letter memory, size and placement for kindergarten students using the HWT approach. This study's findings are also in alignment with this study and Zylstra & Pfeiffer's (2016) who studied a handwriting program for at-risk kindergarteners. In this study, children with IEPs were able to keep pace with their typically developing peers. Similarly, in this study, although there were not significant differences between the intervention and the control group for children without IEPs, there were significant differences on handwriting for children with IEPs. This research supports previous research that children with IEPs and handwriting deficits are in particular need of focused handwriting interventions using a planned and focused program such as Handwriting without Tears.

When comparing pretest and posttest data for both the control and intervention groups, both groups demonstrated a statistically significant improvement in the area of letter memory with a large effect size. This may be due to maturation and the OG instruction program, emphasizes sounding out the letters while writing them. Exposure to the letters and their formation using this direct instruction model may improve handwriting outcomes such as letter memory (Donica, 2009). More research needs to be completed concerning the impact of the OG program alone on handwriting for children in kindergarten in order to determine if an additional handwriting program is necessary, which is likely from my results of the gains made by participants with IEPs.

Qualitative changes through observation in the intervention group were also seen throughout the study and included positive teacher report and positive student interactions. Teachers reported the want and need for increased OT collaboration in the classroom setting and access to resources. Students verbalized having fun and missing the OT when absent after the

study was completed. Overall, the positive outcomes of this study were reassuring that OT direct, collaborative, and consultative services are beneficial in improving students handwriting performance.

When looking at the performance of participants in this study with IEPs in the intervention group, this study confirmed what was previously published in the literature by Donica, (2015), Marr and Cermak (2003), and Zylstra and Pfeiffer (2016) that programs focused on direct instruction of handwriting lead to better handwriting performance gains for all children, even those as young as kindergarten. However, when looking at the overall performance of the control and intervention groups of children without IEPs, this study did not confirm these previous findings. Perhaps a longer intervention period and continued maturation of students within the intervention group will demonstrate improved handwriting performance when using a structured program such as HWT.

Strengths and limitations

This capstone project's strengths included positive teacher and participant feedback throughout and following the study. The teacher in the intervention group commented on how the new language related to handwriting instruction was helpful in the classroom setting throughout the week for her and the aids assisting the students. The teacher in the control group consistently requested collaboration with the occupational therapist following the study to assist with modifying and individualizing curricula for her students. Another strength was the clinical outcomes seen through the study and that each child had fun as evidenced by their willingness and excitement to participate in the program. The children loved the new sensory and prewriting strategies introduced as demonstrated by their enthusiasm and attention during the program. This

ability to engage with the children and have fun created a positive relationship with the occupational therapists in the district.

The limitations of this study were that the control and intervention groups were not equal at the beginning of the study due to convenience sampling. The intervention group had multiple students with IEPs and the control group did not have any students on IEPs. The screener administered lacks research, is not norm referenced, and may not be as sensitive to change as other evaluation tools but was selected due to the convenience of administration and scoring. However, there are limited norm-referenced tools to evaluate handwriting for the kindergarten population. The intervention period was very short and conducted in the fall semester when kindergarten students are learning policy and procedure and developing their fine and gross motor skills. A longer intervention period may have given larger gains in the intervention group, especially since fine motor skills continue to develop during kindergarten. The global pandemic may have impacted outcomes due to student absences and was directly related to the small sample size. Due to these limitations this study has limited generalizability.

Implications for practice

This study indicates that students with IEPs are keeping pace with their typically developing peers based on the similar results discussed in the data analysis. This is an important consideration due to the fact that students on IEPs goals are to maintain and progress their current level of function. This capstone research shows that by providing intervention we are closing the gap for these students and handwriting intervention from an occupational therapist is effective. Many times, teachers feel they must implement or are overwhelmed by implementing entire handwriting curriculums due to the time constraints, and this study shows that five to ten

minutes of direct instruction weekly is beneficial in impacting handwriting outcomes (Donica, 2009).

Teacher buy-in and enthusiasm for the program was valuable. The teacher in the intervention group and the district interventionist mentioned to the researcher after the completion of the study that they noticed children using the verbiage they were taught for letter formation with their writing activities throughout their school day. Since the beginning of this study, multiple teachers throughout the district have heard and asked for additional resources for their classrooms and handwriting language handouts for teaching letter formation. The take away from this as a practitioner is, start small, by beginning in just one classroom there has been a ripple effect across our school district. This study has helped to raise awareness for the occupational therapists role and resources we can offer beyond direct services for our special education children. Overall, this study has had a profound impact on our district and has begun the process for positive change in the years to come.

This study also demonstrates the need for having valid and reliable tools for use by occupational therapists in school based practice. The Screener of Handwriting Proficiency is a tool used readily and is marketed by Learning Without Tools yet is not normed referenced. The tool offers a structured way to measure clinical observation of skill areas that contribute to handwriting. We must have valid and reliable tools available to contribute to evidence-based practice.

This study also continues to demonstrate the importance of collaboration. Evidence shows collaboration has positive impacts on students' performance in the area of handwriting and this study also shows positive outcomes of collaboration directly with the classroom teacher, special education teacher, and aids. Lastly, despite the statistical outcomes of this study it is

important to consider the clinical relevance of the students' performance and what the body of literature states as a whole.

Future Research

The researcher plans to continue this study for the duration of this academic calendar. The only concern for continuing the study is maintaining a true control group as there are potentially students in the classroom that may qualify for OT services prior to the end of the school year. It is also likely that the teachers will collaborate and share resources with each other outside of the Occupational therapist's knowledge.

This study has shown the researcher areas of consideration prior to pushing the program out district wide. First, determining the best and most effective way to collaborate with all teachers given the current caseload being managed by two occupational therapists in the district. Secondly, possible consideration for continued handwriting implementation in 1st grade when students typically have a better understanding and knowledge base of their letters and are developmentally ready for more structured handwriting instruction.

Summary

This quasi-experimental quantitative study found that there were positive clinical outcomes after implementing the collaborative, hybrid handwriting curriculum, in contrast to the traditional classroom handwriting instructional methods and use of OG. Despite not finding statistically significant outcomes in both groups in the areas of letter placement, size, and orientation, gains were observed in letter memory. Furthermore, there was positive teacher perception of the programming and request for continuation of the programming for the duration of the school year, promoting interprofessional collaboration and continued partnerships with classroom teachers. Lastly, this study indicated program modifications and consideration prior to

pushing this programing out to the entire school district to impact larger populations of students and support positive student learning outcomes.

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Appendices

Appendix A: IRB Approval

 Application Management

Hello Merry Harper,

Congratulations! Using a limited review process, the Institutional Review Board at Eastern Kentucky University (FWA00003332) has approved your request for an exemption determination for your study entitled, "Effectiveness of collaborative handwriting curriculum Handwriting Without Tears and Orton-Gillingham, in Kindergarten Classroom setting." This status is effective immediately and is valid for a period of three years as long as no changes are made to the study as outlined in your limited review application. If your study will continue beyond three years, you are required to reapply for exemption and receive approval from the IRB prior to continuing the study.

As the principal investigator for this study, it is your responsibility to ensure that all investigators and staff associated with this study meet the training requirements for conducting research involving human subjects and comply with applicable University policies and state and federal regulations. Please read through the remainder of this notification for specific details on these requirements.

Adverse Events: Any adverse or unexpected events that occur in conjunction with this study should be reported to the IRB immediately and must be reported within ten calendar days of the occurrence.

Changes to Approved Research Protocol: If changes to the approved research protocol become necessary, a [Protocol Revision Request](#) must be submitted for IRB review, and approval must be granted prior to the implementation of changes. If the proposed changes result in a change in your project's exempt status, you will be required to submit an application for expedited or full review and receive approval from the IRB prior to implementing changes to the study. Changes include, but are not limited to, those involving study personnel, subjects, recruitment materials and procedures, and data collection instruments and procedures.

Registration at ClinicalTrials.gov: If your study is classified as a clinical trial, you may be required by the terms of an externally-sponsored award to register it at ClinicalTrials.gov. In addition, some medical journals require registration as a condition for publication. In the case of journals with membership in the International Committee of Medical Journal Editors, clinical trials must be registered prior to enrolling subjects. It is important that investigators understand the requirements for specific journals in which they intend to publish. In the case of sponsored project awards, timeline requirements will vary for awards that require registration. Approved consent forms must be

for awards that require registration. Approved consent forms must be uploaded in the system for all Federally-funded clinical trials after subject enrollment has closed, but earlier registration is not required for all agencies. If you have questions about whether a sponsored project award requires registration and on what timeline, please send an email to tiffany.hamblin@eku.edu before beginning recruitment so that the specific terms of the award can be reviewed. If you have a need to register your study and do not have an account in the system, please send an email to lisa.royalty@eku.edu and request to have a user account created.

If you have questions about this approval or reporting requirements, contact the IRB administrator at lisa.royalty@eku.edu or 859-622-3636.

Appendix B: Letter of Support from school district

To Whom It May Concern:

Letter of Support for Merry Grace Harpers
EKU Capstone Project

We are writing this letter to express our support for Merry Grace Harper to partner with one of our kindergarten teachers at [REDACTED] Mrs. Brasher, to implement hybrid handwriting instruction that correlates with the designated reading curriculum. We support Merry Grace collaborating and partnering with Mrs. Brasher to support the instruction of her classroom students.

Thank you,

A handwritten signature in blue ink that reads "Lisa Radcliff". The signature is written in a cursive style with a large loop at the end of the last name.

Lisa Radcliff

Exceptional Education and 504 Supervisor

Appendix C: Handwriting Program Table

Handwriting Instruction

SUBJECT	TEACHER	GRADE	DATE
K writing	Brasher	00	2021-2022

OVERVIEW

Each letter introduction will begin with whole class instruction on letter formation and each center activity will be introduced. An activity idea or work sheet will be sent home by the OT each week for extra practice. Prior to letter introduction coloring activities and the pencil pick up song will be introduced.

Layout: 5 minutes for whole group instruction

Center activity and Home activity (center activity can be subbed for teacher table if wanted/needed)

WEEK	IN CLASS	HOME
1	<p>Letter “C” will be introduced</p> <p>Verbal instructions: “Magic C”</p> <p>-wet, dry, try</p> <p>Whole class instruction on Lowercase letter formation using the Wet, Dry, Try chalkboard approach (tracing over a letter written on an individual chalkboard, using a wet sponge to trace over the letter to erase it, using a small paper towel to trace over the letter to dry it, then using a piece of chalk to write the letter independently)</p>	<p>Practice letters in bath with shaving creme</p>
2	<p>Letter “o” will be introduced</p> <p>Verbal instructions: “Magic C keep going-stop”</p> <p>-wooden pieces for building letter</p> <p>Whole class instruction for building letter with little curve, big curve, little line, big line language.</p>	<p>Coloring letter practice OR Air writing in the car</p>

WEEK	IN CLASS	HOME
3	<p>Letter ‘a’ will be introduced</p> <p>Verbal Instructions: “magic C, up like a helicopter, bump, back down, bump”</p> <p>-roll a dough letter cards</p> <p>Whole class instruction for letter formation of letter a, and demonstration on how to use letter cards and dough to roll out letters.</p>	<p>Sidewalk chalk writing and water toy ideas</p>
4	<p>Letter “d” will be introduced</p> <p>Verbal instructions: “Magic C, up like a helicopter, higher, back down and bump”</p> <p>-Chalk board writing</p> <p>Whole class instruction via IDTT</p> <p>And wet, dry, try on student application. Review all magic “C” letters.</p>	<p>Shaving crème or whipped crème writing</p>
5	<p>Letter “g” will be introduced</p> <p>Verbal instructions: “Magic c, up like a helicopter, back down and hook”</p> <p>-sand writing and texture cards</p> <p>Whole class instruction magic “c” formation and demonstration on how to write in sand and texture cards.</p>	<p>Window writing or white board writing</p>
6	<p>Letter ‘m’ will be introduced</p> <p>Verbal instructions: “dive down, swim up and over, down, swim up and over, down.”</p> <p>-Letter School App</p> <p>Whole class instruction, dive/swim down letters introduction</p>	<p>Building letters with household items</p>

WEEK	IN CLASS	HOME
7	<p>Letter “L” will be introduced</p> <p>Verbal instructions: “big line down, little line top little line bottom”</p> <p>-wet dry try app</p> <p>Whole class instruction on letter L/l formation</p>	<p>Coloring letter sheet or outside activity with chalk and letter writing game.</p>
8	<p>Letter “h” will be introduced</p> <p>Verbal instructions: “big line down, swim back up, dive down”</p> <p>-roll a dough letter cards</p> <p>Whole class instruction and review of roll a dough letters and h formation.</p>	<p>Letter lego building</p>
9	<p>Letter “t” will be introduced</p> <p>Verbal instructions: “big line down, cross”</p> <p>-letter school app</p> <p>Whole class instruction for letter formation, review big line/little line and big curve/little curve language.</p>	<p>Playdough letter activity cards</p>
10-16	<p>Teach Letters: J/j, K/k, P/p, U/u, B/b, R/r, F/f, N/n, E/e, S/s, X/x, Y/y, W/w, V/v, Z/z, Q/q</p>	