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About the Journal

Founded in 2013, the Journal of Teacher Action Research (ISSN: 2332-2233) is a peer-reviewed online journal indexed with EBSCO that seeks practical research that can be implemented in Pre-Kindergarten through Post-Secondary classrooms. The primary function of this journal is to provide classroom teachers and researchers a means for sharing classroom practices.

The journal accepts articles for peer-review that describe classroom practice which positively impacts student learning. We define teacher action research as teachers (at all levels) studying their practice and/or their students' learning in a methodical way in order to inform classroom practice. Articles submitted to the journal should demonstrate an action research focus with intent to improve the author's practice.

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USING FIRST AUTHOR© WRITING CURRICULUM WITH STUDENTS WITH AUTISM SPECTRUM DISORDER

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Abstract For individuals with autism spectrum disorder (ASD), writing can potentially aid in increased communication, socialization, and independence. Yet these students historically have been excluded from purposeful writing activities and instead have received limited literacy learning instruction. In this action research project, we observed the effects of a high-quality writing curriculum on three young students with ASD. We utilized a qualitative case study design to answer the following question: What are the effects of the First Author® Writing Curriculum and technology program on the writing and engagement of elementary school students with ASD? Results indicated that all three students appeared to benefit from the use of the First Author®. The teacher also reported feeling more confident and prepared to teach writing to her students. General themes included increased student engagement, willingness to transition, and increased quality interaction with technology and with other students/adults. Practical implications, limitations, and future research direction will be provided.

Keywords: teacher action research, autism spectrum disorder, engagement, technology, writing

Introduction

Writing is a means of expression, personal reflection, and self-discovery (Kluth & Chandler-Olcott, 2008). Writing is often used both in and out of the school setting as a method of demonstrating one's understanding of content, sharing ideas, and communicating with others. In the current age of text messages, email communications, and social media, students need to be aware of and able to use different forms of written communication. Yet writing often poses as a challenge to many individuals with and without disabilities; among people who face these challenges are those with autism spectrum disorder (ASD).

For individuals with ASD, writing is especially important because it can aid in increased communication, socialization, and independence (Wollak & Koppenhaver, 2011). Although some people with ASD are skilled writers who effectively use writing as a means of communication and expression, many students with ASD struggle to write well. Specific characteristics of students with ASD may interfere with their ability to engage in the writing process. These include language delays that impact their ability to produce written products (Sturm, 2012), difficulty utilizing writing strategies such as planning, organizing and generating content (Joseph & Konrad, 2009), lack of self-regulation (Asaro-Saddler & Saddler, 2010) and executive functioning skills (Carnahan, Williamson, & Christman, 2011) required for writing, and physical and/or sensory impairments that may impact their ability to produce written products (Wollak & Koppenhaver, 2011). These characteristics, coupled with the fact that individuals with ASD often receive inadequate literacy instruction (Joseph & Konrad, 2009), results in their tendency to perform well below their peers in the area of writing (Bishop, Sawyer, Alber-Morgan, & Boggs, 2015).

Literature Review

Historically, students with ASD have been excluded from purposeful writing activities (Carnahan, Williamson, Hollingshead, & Israel, 2012) and instead have received limited literacy learning instruction, often focused on functional skills such as copying words and sentences, worksheets, and handwriting drill-and-practice (Asaro-Saddler, Arcidiacono, & Morris-Deyoe, 2017; Sturm, 2012). This may occur for several reasons. First, many educators continue to believe that a life-skills, functional perspective is most appropriate for students with ASD (Ruppar, 2015; Ruppar, Dymond, & Gaffney, 2011) and that writing instruction is superfluous. In fact, one of the greatest barriers to writing for students with ASD is that their teachers do not believe they are capable of becoming writers (Keefe & Copeland, 2011; Sturm, 2012). In addition, educators often lack training in how to provide evidence-based writing instruction (e.g., Cutler & Graham, 2008). Even with training, teachers often do not have appropriate curricular guides, appropriate writing tools, and time allocated in the day to provide instruction (Sturm, 2012; Sturm, Cali, Nelson, & Staskowski, 2012). Unfortunately, this results in students with ASD learning to write in decontextualized environments, rather than through authentic uses of literacy skills in everyday activities (Ruppar, 2015), and does not allow them to receive the support or develop the appropriate skills they need to become proficient writers.

Research has found, however, that when provided with effective, evidence-based instruction, students with ASD can develop higher-level writing skills. For example, a review of the literature was conducted to explore the effectiveness of writing interventions with students with ASD (Pennington & Delano, 2012), and found several potentially effective writing interventions. Among these is the self-regulated strategy development (SRSD), an approach that combines strategy instruction with prompts for self-regulation such as goal setting and self-monitoring. Studies using this intervention found positive findings in the persuasive writing and story writing of elementary school students with ASD (see Asaro-Saddler, 2016 for a review). Other studies have highlighted the use of technology for students with ASD to write stories (e.g., Pennington, Collins, Stenhoff, Turner & Gunselman,

2014; Schneider, Codding, & Tryon, 2013), name writing (Moore, Anderson, Treccase, Deppeler, Furlonger, & Didden, 2013), and check the spelling of words (e.g., Kagohara, Sigafoos, Achmadi, O'Reilly, & Lancioni, 2012).

One technology program that has recently been explored with students with ASD is First Author® Writing Curriculum and technology program. This program was developed by Dr. Janet Sturm specifically for beginning writers with complex learning needs such as ASD and designed in consideration of Universal Design for Learning (UDL) principles (Sturm, 2015). It guides students through a three-step writing process of choosing a topic, selecting a picture prompt, and writing with the support of built-in accommodations such as word banks, on-screen keyboards, and self-regulation prompts. Mini-lessons, which occur for about 5-15 minutes, focus on one specific skill for the day (e.g., adding a period) and are taught through explicit instruction (Sturm, 2015). Lessons include a tip sheet consisting of both simple words and pictures to help students remember the essential information. Writing time follows the mini-lesson, and then students are given the opportunity to share their work in the Author's Chair. In one pilot study, preliminary analyses found that secondary students with ASD and developmental disabilities who used First Author® reported mixed results, indicating that students showed some improvements in writing quality and quantity when being taught using First Author® (Asaro-Saddler, Muir-Knox, Meredith, & Akhmedjanova, 2015). However, no known published study has explored the effects of the program on young beginning writers.

Methodology

Context for the Current Study. The first author, a special education teacher and doctoral student, wanted to provide her students with quality writing instruction in which they could engage appropriately. She worked with the second author, a researcher, to implement an action research project in which they could observe the effects of First Author® Writing Curriculum on the young students with ASD in her class. Specifically, a qualitative case study design was utilized to answer the following question: What are the effects of the First Author® Writing Curriculum and technology program on the writing and engagement of elementary school students with ASD?

Participants. Participants in this study were Osvald, Palen, and Chindi (pseudonyms), three males of European American descent between 5 and 8 years old, and their teacher. The students' Individualized Education Programs (IEP) each listed their primary diagnosis as ASD, and they were placed for part of their day in a self-contained program that was serving students with communication and cognitive delays. Specifically, Osvald and Palen spent 80% of their time in the special education setting, while Chindi spent 10% of his time there. The classroom was comprised of twelve students, one dually certified special education/literacy and elementary education teacher, three teaching aides, and one teaching assistant (certified teacher and able to provide direct instruction). Student participants were referred for the study by the first author, who was their teacher at the time of the study. The study occurred in a suburban elementary school in the Northeastern United States.

Materials. First Author Writing Curriculum® (First Author®) was used with the participants in this study. The First Author® package included a curriculum guide with 80 mini lessons, an instruction guide with 63 tip sheets, assessment guide, classroom posters, teacher resource CD, and writing software. The lessons, which are designed for developing writers, each began with a short mini-lesson, followed by independent writing time, and ended with Author's Chair, which was an opportunity for students to share their writing with the group.

First Author® software offered several assistive features during the writing process. First, students were directed to a planning screen that supports topic selection by providing photo images that can be individualized by the teacher. Students selected a photo and were then taken to the composing screen. The composing screen had on-screen keyboards and word banks that included topic specific words in addition to high frequency and frequently misspelled vocabulary. A read aloud feature and self-regulatory prompts (e.g., verbal cues to continue writing) were also provided. The final screen read the students' work aloud and included a "publish" option, which created a book cover with photos and author's name.

Other materials included a classroom desktop computer or pencil and paper used for writing, a Macbook Pro® laptop to video record each lesson, and augmentative communication program, Proloquo2Go® which was accessible on an iPad® to each student during the lessons. This program was utilized by students as a part of their daily routine; therefore, it was provided during the writing lessons as well.

Procedures. The teacher worked one-to one on writing daily with each of the three participants. Each lesson was composed of two parts: a mini lesson from the First Author® Curriculum, and then writing time, in which the students used the skill from the mini lesson to guide their writing. During writing time, students had the option to start a new piece or finish one they had already been working on. After the students completed their writing they printed it and could either take it home or put it in the classroom library. There were no time constraints put on the mini-lesson or writing time; however, mini-lessons were designed to be no longer than 15 minutes.

Each session varied, depending on the topic, student's interest, motivation and engagement. Throughout the implementation of the writing intervention, students received the same lesson either once or multiple times, at the teacher's discretion. This was important because the students' writing success, engagement and achievement was the ultimate goal for the study, and moving on to the next lesson, if the student had not truly mastered the goal from the previous lesson, would not have been ethical. Each lesson was recorded for later analysis, and the teacher completed field notes after each lesson (see below).

Data Collection and Analysis. Data were collected over 10 months during the academic school year (September- June) and contained multiple components: First Author® Teacher Management software, video observations of each session for each student, and field notes from the teacher for each lesson.

The First Author® Teacher Management Software automatically measured student's writing achievement. The software included measures such as Topic Diversity, which measured and

quantified the various topics the writer self-selected; total intelligible words (TIW), which measured overall intelligibility of the student's words and written fluency; and total unique words (TUW), which measured the overall vocabulary diversity.

Each lesson (mini-lesson and writing) was video recorded. For each student 60 minutes of pre-selected video recording was transcribed. The video segments were selected at random; some were of the mini lesson, some were of the writing session, and some were a compilation of both. After the transcriptions were completed another researcher compared the transcriptions to the videos for reliability and validity. Transcripts were used to identify writing behaviors and engagement. After watching and transcribing the videos, researchers created a list of codes based on behaviors they noted while watching the videos, as well as previous research regarding engagement of individuals with ASD. Researchers went through the transcriptions and coded the student's behavior. See Table 1 for a list of the codes developed and used.

Table 1: List of Codes

Code	Description
Verbal initiation	Students initiated a verbal comment about the lesson topic
Initiation with technology	Student initiated a comment about the lesson using the Proloquo2Go© app
Other non-verbal initiation	Student initiated by pointing to an object or a picture to communicate what they wanted
Verbal response	Students verbally responded to a request or question
Response with technology	Students responded to a request or question using the Proloquo2Go© app
Other non-verbal response	Students responded to a request or question by pointing to an object or a picture to communicate what they wanted
Echolalia	Student repeated what the teacher was saying or repeated a phrase they commonly used that was not relevant to the lesson
Physical aggression	Student hit, kicked, swiped or threw an object.
Stimming	Student engaged in repetitive behaviors (physical or verbal).
Eye contact	Student looked at the teacher in the eyes or looked at the screen when asked.
Waiting	Student was in the designated instruction area and delaying behavioral impulses.

Escaping/leaving work area	Student left (or tried to leave) the instructional area without permission
Disengaged	Student gave off topic responses or stared off into the distance
Distracted by external stimuli	Student was unable to concentrate on the mini-lesson or writing because of another student or environmental situation

Note: Codes in which the child was considered to be "engaged" in the lesson are bolded, while non-bolded items were behaviors in which the child was considered to be "not engaged."

Field notes were taken during and after each lesson of the study. The field notes included both descriptive and reflective information about the student and session. The notes were organized and completed in response to questions. This was important because it allowed the teacher to collect notes on the same information for each student, as opposed to a random narrative about the session. The notes included the date, student name, title/lesson number and attempt, did the student write during the lesson, what did they write, what was the topic, how many words were written, the level of assistance, student behaviors and additional comments and observations. These notes, combined with video transcripts, allowed researchers to examine the ways in which the participants engaged with First Author®.

Results

There were a variety of complex findings worth noting in regards to this study. Specific themes emerged from the data across all three student participants, as well as among individual students. All three students and the teacher seemed to benefit from the use of the First Author®, and the classroom was a better place for using it. General themes included increased student engagement, willingness to transition, and increased quality interaction with technology and with other students/adults. Specifically, engagement was noted to be a very important theme. Upon viewing the videos, students were engaged in an average of 67% of the time, with Osvald engaged 82.7% of the time, Palen 63.2% and Chindi 57.2%. Overall improvements in writing, such as increased topic diversity and quantity of writing, were also noted. We will now discuss specific findings for each participant.

Osvald. Osvald benefited most from the First Author® Writer's Curriculum. Specifically, Osvald showed an increase in topic diversity, increased time writing, more opportunities to write, increased academic language, increased quality of writing, decreased problem behaviors and easier transitions from preferred activities to writing. Osvald's interactions with writing prior to First Author® were delivered via a structured task system in which he would complete a certain number of writing activities (handwriting worksheets and handwriting skills) each day. He struggled to generate ideas for writing and fatigued quickly when asked to write sentences. His writing experiences were limited and driven by his lack of interest in the task.

During the First Author® sessions, Osvald used planning methods, such as brainstorming and making lists, to improve his writing. He was able to progress from needing word banks to facilitate his writing/typing to writing without using word banks and developing phrases independently. Results also indicated that Osvald had increased topic diversity. Prior to First Author® he struggled to choose topics on his own; however, once he was able to see that whatever he was thinking of could be typed into the software and an image would come up, he began to choose a variety of topics. The variety of topics allowed the teacher and readers of his work a deeper and richer access on what was "going on inside of his head", which was especially important due to his lack of language. Osvald's writing quality also increased. Since this curriculum required Osvald to write quality pieces every day, he wrote more stories when engaging in First Author®. Prior to using the software Osvald, had never written a story. During the study, Osvald willingly wrote numerous stories during one session on various topics. His writing experience expanded beyond handwriting to quality writing experiences.

First Author® Writing Curriculum also had an impact on Osvald's behavior. He had a behavior plan that targeted physical aggressions and elopement (running away), since he was averaging 45 physical aggressions a day. When we implemented the intervention, on the other hand, we reported an average of 7 physical aggressions, and they were mainly during one session. The teacher reported that because of Osvald's decreased physical aggressions when using First Author® she was able to have more quality academic interactions with him. The teacher also reported that Osvald's academic language increased. He was reported using phrases like "let's write," and "I am a writer."

The teacher reported that Osvald transitioned to writing with greater ease. Prior to the study, Osvald would elope, cry, scream, or engage in self injurious behaviors when it was time to transition from a preferred activity to writing. During First Author, Osvald would transition willingly and would even ask to write during his breaks. Osvald also began to view writing as a collaborative and personal experience and not an isolated one. He would collaborate during planning, he would interact with the computer during writing and look at others' stories, and when finished he would read his writings to his peers from the author's chair. He also began taking his stories home, and his mother would integrate them into his bedtime routine.

Palen. Palen also benefited from the First Author® Writer's Curriculum. He showed an increase in topic diversity, increased time writing, more opportunities to write, increased academic language, increased quality of writing, and easier transitions from preferred activities to writing. Like Osvald, Palen's interactions with writing prior to First Author® also consisted of writing via a structured task system in which he would complete a certain number of writing activities (handwriting worksheets, iPad writing activities, Velcro sentence construction) each day. He struggled to generate ideas for writing and fatigued quickly when asked to write sentences by hand.

One of the greatest findings with Palen was the significant increase in topic diversity. Prior to First Author® the teacher reported Palen struggling to attach topics to writing and to the concept that you write sentences to describe your topic. After mini-lessons and writing sessions, Palen quickly was able to navigate the software and would search topics that he had learned about earlier in the day. His topics ranged from Starbursts to remote control cars. Palen also wrote more. He engaged in writing for longer periods of time, and wrote numerous stories per session; sessions in which Palen wrote 6 stories, for example, were not unusual. Palen's academic language was also noted to increase. The teacher reported that he would ask for his writing tip sheet and would verbally identify punctuation he needed for the end of sentences. Palen's success in First Author® carried over to his family life. His family asked that writing goals be put on his IEP moving forward, and he even gifted his printed-out stories to family friends and siblings for Hanukah. Palen transitioned easier to writing when it was First Author® writing time, and began viewing writing as a personal experience.

Chindi. Chindi also benefited from First Author® Writing Curriculum, however his lack of typing ability prevented him from benefitting as much as his peers did. For example, Chindi did not know how to maneuver the mouse, so the teacher had to guide his hand, which inherently removed 100% of the choice during his time on the computer. More specifically, if Chindi wanted to exit the software, he could not because he could not move the mouse. His stimming and lack of technological skills negatively impacted the amount of academic achievement and engagement he had. He did not know how to type, so the typing portion of the lessons were heavily prompted. First Author® did provide Chindi with an increased amount of writing opportunities though. Prior to First Author®, Chindi wrote with his class, but during First Author® he was able to write both during time with his class and during his 1:1 time with the teacher. He was observed to write in every lesson.

The teacher reported that Chindi had an increase in topic diversity, from 0 to 28 unique topics. On occasion, he wrote on the same topic more than once. Prior to First Author® Writing Curriculum Chindi did not suggest his own writing topics. When he was able to use the software, he was able to verbalize to the teacher or point to what he wanted to write about. He wrote about things like his family skiing, tea parties and Disney World. Chindi's participation in First Author® carried over to his family life. He would bring his stories home and put them on his bookshelf at home, and his parents asked for writing goals for his IEP for the next year. Chindi was very proud when he got to read his story in his kindergarten general education classroom.

Teacher. Throughout the duration of the study the teacher took a variety of field notes and reflections. Implementation of the First Author® Writing Curriculum provided significant support for the teacher. Throughout the intervention the teacher's results showed themes of increased reflection, increased quality interactions with the students, increased quality of home and school connections, increased preparedness, and efficacy as an educator.

In regards to efficacy as an educator, the teacher reported feeling better prepared to teach her students because of the resources that the curriculum included. The teacher could focus more on delivery than content, which made the content more accessible to the students. More specifically, the traditional standards do not necessarily speak to the needs of the students, and they do not address students with significant cognitive abilities. This curriculum was specific, intentional and sequential, which allowed for the teacher to spend time taking that content and finding a way for it to connect with students instead of designing the content as well. The teacher was happier, more confident, and satisfied with the teaching of these students, because the students were being exposed to rigorous and quality instruction.

Connections with students were also impacted by the curriculum. The teacher had a script to follow that connected directly with the writing skills students were asked to learn. The teacher reported being able to overtly model successful academic interactions with students for other staff. More specifically, the staff and administrators were able to see the students doing something academically rigorous, and it helped change perceptions and possibly improve interactions between students and paraprofessionals.

Discussion

In this study we sought to examine the effects of the First Author® Writing Curriculum on the writing and engagement of three elementary school students with ASD. Results indicated that for the students in this study, writing moved from handwriting and tracing letters to actually writing stories based on their preferred and self-selected topics. This represented a shift in thinking about what writing was for these three students, and what they were capable of as writers.

Findings from this study indicate that the participants were highly engaged during the mini-lessons and writing time. This is a promising finding, since students with ASD often have difficulty engaging during instructional time (Sparapani, Morgan, Reinhardt, Schatschneider, & Wetherby, 2016). Students seemed to require less redirection and were able to transition more quickly from a preferred activity to writing time.

The students were also observed to be writing more, a positive finding given that many students with ASD do not often engage in typical writing activities. In one study, for instance, Ruppar (2015) found that students with ASD and other intellectual disabilities spent minimal time (only 11%) of their identified literacy block engaged in writing, with only one of four teachers observed to include writing in class literacy activities. Therefore, the fact that students were engaged in personally meaningful authentic writing experiences was commendable. Additionally, the students were noted to increase their topic diversity. This was an especially encouraging finding as the participants in this study, like many people with ASD, had specific interests that they tended to want to discuss all the time (Gunn & Delafield-Butt, 2016). The fact that they could use the software to brainstorm and have pictures to support their ideas was a benefit.

The teacher in this study reported feeling more confident and prepared to teach her students when using the First Author® Writing Curriculum, a positive finding given that many teachers, both special and general education, do not feel prepared to teach writing to their students (Cutler & Graham, 2008). Programs such as First Author® may help to fill a gap for many teachers of students with complex support needs who believe that they do not have the appropriate curriculum or materials to teach writing to this population (Sturm, 2012; Sturm, Cali, Nelson, & Staskowski, 2012).

An unanticipated outcome of this study was the way in which use of the program enhanced home/school relationships. Parents were reading their children's stories at home and one student actually gave his stories as presents. In addition, two of the three participants' families asked that individual goals in writing be added to their children's IEPs. This was an especially exciting finding, because it represented the fact that the parents now believed their children were capable of being writers, which they had not thought before.

Limitations and Implications

Since this was a qualitative, exploratory study, there was no data examining the gains in writing achievement and engagement prior to and after using the First Author® Writing Curriculum. Future research should consider utilizing single-case or group design studies that examine the effectiveness of the program on young writers with ASD. In addition, it is unknown whether the writing lessons or the technology had a greater effect on the students' ability to attend and improve writing outcomes. Future research directly comparing technology with paper/pencil writing tasks will help determine whether the lessons or the software program alone may have an impact on students' writing. Similarly, although students were highly engaged during both the mini-lessons and while using the software, it might be interesting to note trends in students' engagement across these two aspects of the program (i.e., during which part of the lesson were they more/less engaged).

Conclusion

The findings of this action research project add to a small but growing body of research on writing for students with ASD. Using a qualitative case study method allowed for more in-depth, rich observation of the effects of the program beyond quantitative outcomes. We hope that this study may draw attention to the possibility that students with ASD and concurrent communication and cognitive challenges may become skilled, competent writers when given proper instruction. In addition, we believe this study allows teachers to see the benefits of using such a program to allow for more personalized, meaningful, and contextualized writing instruction for all students.

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