Classroom Teachers' Perceptions of the Printing Like a Pro! Program: A Focus Group Study

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Abstract

Printing Like a Pro! is an accessible, free to download printing program developed by two occupational therapists for use at school and home. This qualitative study explored primary-grade teachers' perceptions of using *Printing Like a Pro!* during general classroom-based handwriting instruction in a large urban school district. Convenience sampling was used to recruit primary-grade classroom teachers with experience in use of the program to participate in a small focus group. Transcribed interviews were analysed using thematic analysis to learn about their experiences with the program. Five themes were derived from the data. Teachers found the program to be: (1) intuitive to use; (2) effective; and (3) inexpensive but identified a need for: (4) better knowledge dissemination and teacher training; as well as (5) program revisions and enhancements. Findings have and will continue to further inform program development to improve the program for classroom use. Results substantiate the need for school-based occupational therapists to advocate for use of evidence-based handwriting programs in the classroom. Additionally, occupational therapists should expand their efforts to build capacity of classroom teachers through more extensive teacher training to better support use of effective instruction and evidence-based remediation of handwriting difficulties in the classroom.

Keywords

Handwriting, Handwriting Intervention, Writing Instruction, Elementary Education

Introduction and Literature Review

Handwriting occupies much of the elementary-aged students' school day and is the main method used to demonstrate knowledge in the classroom (Case-Smith, 2002; McMaster and Roberts, 2016). It is therefore troubling to note high rates of student handwriting difficulties, ranging from 5% to 33 % (Karlsdottir and Stefansson, 2002;

Overvelde and Hulstijn, 2011). Students with developmental disorders, including those with developmental coordination disorder, often struggle with proficient handwriting (Blank et al, 2019; Prunty and Barnett, 2017). Illegible writing can conceal academic ability, detract from content, and adversely affect how classroom teachers perceive written work (Graham, Harris, and Hebert, 2011; Greifeneder et al, 2010; Santangelo and Graham, 2016), leading to student avoidance of writing, frustration, and challenges in meeting written demands (Case-Smith, 2002; Feder and Majnemer, 2007; McCarney et al, 2013).

Cumulative evidence about handwriting practice should be used to inform current interventions to address handwriting challenges within the school system. Students, especially those who struggle with handwriting, benefit from timely, explicit, and direct handwriting instruction (Donica, 2010; Fancher, Priestley-Hopkins and Jeffries, 2018; Hoy, Egan and Feder, 2011; Laverdure and Wilmer, 2018; Santangelo and Graham, 2016). Therapeutic task-specific handwriting intervention of sufficient intensity is effective for improving handwriting legibility (Fancher et al, 2018; Hoy et al, 2011; Santangelo and Graham, 2016). Further, evidence indicates that explicit handwriting instruction not only improves students' handwriting legibility, fluency, and length, but also enhances their compositional writing (Santangelo and Graham, 2016). Thus, the regular and sufficient use of evidence-based handwriting programs in the classroom is an ideal foundation for all students, especially those at risk or experiencing learning challenges.

One of the most common reasons for referral to school-based occupational therapy (OT) is difficulty with handwriting (Cramm and Egan, 2015), yet OTs, who are considered handwriting experts, often are faced with variable and limited funding for direct service provision (Feder, Majnemer and Synnes, 2000). Teachers struggle to fill this gap, with many feeling that they are not qualified to address handwriting difficulties (Graham et al, 2008). Further, standards in handwriting instruction are inconsistent between schools, grades, and classrooms (Donica, 2010), and many teachers are not aware of evidence-based handwriting programs (Asher, 2006). Lastly, limited information exists in how teachers choose handwriting programs, but literature suggests that teachers value programs that meet the needs of their students, are effective, and easy to implement (Benson, Salls and Perry, 2010).

To meet these gaps, we developed *Printing Like a Pro!,* a no-cost, user-friendly, task-specific, and evidence-informed printing program (Montgomery and Zwicker, 2011; 2013; 2019; Zwicker and Montgomery, 2012). The program is grounded in motor learning theory and is based on research evidence for handwriting instruction and intervention (Montgomery and Zwicker, 2011; Zwicker and Montgomery, 2012). More information about the *Printing Like a Pro*! Program and the program itself (including practice worksheets for free download) is available from: http://www.childdevelopment.ca/SchoolAgeTherapy/SchoolAgeTherapyClassResources.aspx.

This primary-grade program was originally designed to be prescribed by OTs for use by resource teachers with individual students struggling to learn to handwrite (manuscript printing). However, many primary classroom teachers began to use the program for whole-class instruction. As *Printing Like a Pro!* was being directly used in the classroom, we wanted to better understand classroom teachers' perspectives

about the program. Thus, the purpose of this study was to explore the perceptions of primary teachers who had used the Printing Like a Pro! program in their classroom. Teacher perceptions of usability in the classroom are relevant because this knowledge can inform and guide further development of classroom resources, as well as support to classroom teachers by OTs to ensure that Printing Like a Pro! is easy to implement. Using a classroom-ready, evidence-based handwriting program, with OT support, provides classroom teachers with the tools to offer effective instruction for all students.

Study objectives
(a) To evaluate teachers' perceptions and views of the ease of program implementation;
(b) To explore teachers' perceptions and beliefs about program effectiveness; and
(c) To investigate teachers' perceptions and views on program benefits and weaknesses.

Methods

Research design
A small focus group was used in this qualitative research study to explore teachers' perceptions, attitudes, and opinions of use of the program. Specifically, the focus group format was selected to foster expression of different points of view from discussion and to generate additional ideas that might not be revealed without this interaction (Lamenza, 2011). Further, the group discussion, in which participants were encouraged to elaborate, analyse, and justify their views, can offer insight into the reasoning behind teachers' thinking to inform program development (Plummer-D'Amato, 2008a).

Ethical approval to conduct this study was granted by the University of British Columbia / Children's and Women's Health Centre of British Columbia Research Ethics Board and School District No. 43. Participants provided informed, written consent to participate in the study.

Participants/Sample

Recruitment and inclusion criteria.
Convenience sampling was used to recruit primary grade classroom teachers with experience (at least one year of classroom use) in use of *Printing Like a Pro!*. Teachers who had used the program in the past but were no longer using it were also eligible to participate.

Exclusion criteria
Teachers with less than one-year of classroom use of the program were not included.

Data collection, procedures, and timelines
The focus group occurred in late spring at a school district meeting room during a mutually convenient time. The moderator, who facilitated group discussion, was a neutral third party. A note-taker was also present to make hand-written notes, record focus group feedback and non-verbal behaviors, and observations during the discussion (Lamenza, 2011; Nagle and Williams, 2013).

A pilot-tested set of open-ended questions, along with prompts and probes (Appendix), was used by the moderator to guide discussion (Lamenza, 2011; Nagle and Williams, 2013). Data were collected via audio recording of the group discussion.

Data analysis and overall rigour

Analytical rigour

The first author transcribed the entire focus group discussion as spoken (Plummer-D'Amato, 2008b). Thematic analysis, as outlined by Braun and Clarke (2006), was used to actively search for, identify, code, and analyze themes or patterns from the participants' responses to learn about their experiences with the program. Thematic analysis is independent of theory and epistemology, affording flexibility yet potentially yielding a rich and detailed analysis of the data (Braun and Clarke, 2006). Braun and Clarke's (2006) six levels of thematic analysis were used: (1) familiarisation of the data; (2) generating initial codes; (3) searching for candidate or potential themes; (4) detailed reviewing of candidate themes; (5) defining, refining, and naming of finalized, internally consistent, distinct themes (with sub-themes); and (6) final scholarly analysis.

Auditability and dependability

A lengthy audit trail, which is a documented decision trail, was used to decrease researcher bias in analysis and provide evidence of dependability/reliability (Plummer-D'Amato, 2008b). This included the pre-determined questions, the transcript of the focus group, and a clear explanation of theoretical, methodological, and analytic decisions made (i.e., how data were transformed into codes, then themes, and how themes were explored) to allow another person to draw similar conclusions to those of the researcher (Plummer-D'Amato, 2008b).

Credibility

Credibility or believability of the results was maximized by ensuring that participants felt comfortable about expressing their ideas. To address participants' comfort in sharing their views, neither of the developers of the program were present and a neutral, experienced moderator facilitated the focus group (Plummer-D'Amato, 2008a). A research assistant secured written consent before the focus group started. Additionally, numerous quotes from participants have been included to give the reader more depth of understanding and to substantiate thematic findings (Plummer-D'Amato, 2008b). Member-checking also occurred to ensure that participants agreed with findings (DePoy and Gitlin, 2011). Lastly, peer debriefing took place through discussion of analysis and conclusions with colleagues with experience in school-based handwriting intervention (Plummer-D'Amato, 2008b).

Confirmability

Confirmability included strategies to limit bias, such as full disclosure of the author's background and ties to the program, use of a neutral moderator, and use of an audit trail (DePoy and Gitlin, 2011; Plummer-D'Amato, 2008b).

Results

Description of setting and participants

This study was carried out in a large urban school district in the Greater Vancouver area of British Columbia, Canada. The group size was small and intimate (n=3) to gain in-depth insights from participants' experience in use of the program (Plummer-D'Amato, 2008a). The smaller group size was conducive to quieter individuals, allowing them to be able to participate more than they would in a larger group (Plummer-D'Amato, 2008a).

Participants were all female, aged 25-54, with a bachelor's degree. Teaching experience ranged from 5 to 29 years with primary grade teaching experience extending from less than 5 to 24 years. Classroom size varied from 21-30 students with 0-3 students with special needs in each class. All teachers had used the program for at least one year in their classroom (two split kinder-garten/grade one classes and one straight grade one class).

Themes

Five themes, plus four sub-themes, were derived from the data. The *Printing Like a Pro!* program is: (1) intuitive and easy to use; (2) effective; (3) inexpensive; with a need for (4) better knowledge translation, specifically (a) better dissemination and (b) need for more teacher training in use of the program; and (5) further program development with (a) revisions and (b) enhancements.

Theme 1: Intuitiveness.

This theme was derived from the teachers' perceptions that the program was easy to use, accessible, and flexible; thus, intuitive. This included participants' descriptions of using the program with a range of ages and level of abilities/diagnoses, "friendliness" of use (for children, teachers, and parents), and overall adaptability of the program. The flexible nature of the program is illustrated below. (Only pseudonyms of participants are used.)

> *"I had a girl in my class who was diagnosed . . . with mild cerebral palsy*
> *. . . so it was started because of the girl in my class with special needs*
> *and then just because it is good for that age group, we started doing it with everybody."* – Ms Bates

The progression of fonts on each worksheet page, from more to less structure (such as the "bubble-letters", followed by "letter-boxes" and then fading to the "starting-dot") as well as the developmental progression of the program was highlighted as a child-friendly feature of the program. Teachers liked the use and order of letter groupings (i.e., Downers, Rounders, Curvers, Diggers, and Sliders).

> *"I like how there are the sections . . . and it progresses from being the easiest*
> *to the hardest. And it probably makes [it] easier to buy into… if you start with something*
> *that is … hard at the beginning of the year, then they are not going to want to do it. So it is*
> *nice to have some successes and then [it] gets harder".- Ms Cole*

The teachers also described and labeled the self-talk as "scripts" and these scripts factored repeatedly into their positive description of ease of use. Ms Bates indicated, "It is easy to use. The language you are supposed to use is written right there . . . how … to make the movement ... Essentially it is like a script."

The flexible and "a la carte" accessible design and online access was identified as another feature that factored into intuitive ease of use.

> *"I like that there are different components to it and added sections that if*
> *you need more work you can go to those things, but you don't have to. But*
> *you can also choose, when you are downloading, oh I have some kids that*
> *are terrible at their numbers, and just the sliders are giving us trouble, so you*
> *can go back and do that, without having some whole big book that you have to deal with".*
> *– Ms Bates*

Lastly, online access to the program for both teachers and parents was another perceived strength related to ease of use and adoption of the program. For example, Ms Cole reported,

> *"I downloaded it and it is really easy. You just go to the website and pick the ones you*
> *want. You download it and … can even save it… a digital copy."*

The ease of the program was echoed by Ms Bates:
> *"I also like fact that especially that for a child with special needs, the parents can also go*
> *to the website … themselves . . . [they] can work on it too and that is very helpful. It is*
> *really easy to use. Parents have even said that … how easy it was."*

Theme 2: Program is effective.
The design of the program, with one letter per page, varied and numerous worksheet sets, and the element of self-evaluation arose as key factors to the teachers' perception of why the program is effective. The extensive and comprehensive worksheet sets, designed with repetition as well as review elements, allow for structured, repetitive practice necessary for permanent motor learning.

> *". . . compared to other programs that did not have as much*
> *practice … and probably did not yield the best results because they*
> *were simpler, so maybe just a couple lines, and a mixture . . . [of both]*
> *upper and lower case of a certain letter, all on one page, … wasn't*
> *quite enough practice. I also think the self-reflection piece is important "*
> *". . . It's a difficult concept to teach to young children, but maybe the*
> *more ways we work it into the daily routine, the better the children will*
> *become at looking at their work more critically." – Ms Bates*

Teachers reported on the effectiveness of the program in the observable, positive results that they have seen in their students' printing with generalization to other written work. For example, Ms Bates commented, "You can see the improvement in students' printing transfer to other writing assignments, not just the printing [worksheets]." Ms Cole shared similar sentiments: "I think I see the program working because students, after practice, are able to identify how their letters are formed and translate them into their writing."

Theme 3: Inexpensive. Printing Like a Pro!
No-cost, online access was appealing, especially when compared to the cost of other popular handwriting programs. Comments such as, "*I love that it is free*" from Ms Arleen and "*Yes, it works and it's simple and free*" from Ms Bates exemplify the appeal of a free program.

Theme 4: Knowledge translation.
Subtheme: a) Poor awareness and need for better dissemination
Knowledge translation, which includes efficient diffusion and communication of this relatively new program to classroom teachers, was perceived as a weak point. Teachers reported that they mainly learned of the program's existence through word-of-mouth or sharing of photocopied versions of the worksheets within their school. They perceived a lack of a systematic method of alerting classroom teachers to this relatively new tool, including the website from which the worksheets can be downloaded. For example, Ms Arleen commented, "*About two or two and half years ago, a [paper] package was passed around by teachers.*" Ms Cole reported, "*. . . I also heard about it from the kindergarten teacher ... so then when I taught grade one, I started using it.*" Ms Arleen further stated:

> *"One of the other OTs in the district . . . told me about it when I was*
> *teaching a K/1 split. So that is when I started . . . to photocopy them,*
> *but I had no idea that there was a website."*

A simple suggestion provided by the teachers was to add the website link to the bottom of every worksheet page.

Subtheme b) Need for more teacher professional development
Ample teacher professional development opportunities to learn about the program were clearly stated and reiterated, as exemplified by Ms Bates' comment: "*I did go to a workshop . . . so that was helpful.*" Ms Arleen indicated that more than one workshop per year would be beneficial:

> *"I didn't get to go to a workshop but I think that if it was offered multiple*
> *times in the year … you can pick things up in March … and… if you*
> *have a kindergarten class, then they are a little more ready to print in*
>
> *March than they are in Sept."*

Theme 5: Program development
Subthemes: a) Revisions needed

The teachers discussed ways that the program could be improved and revised, including suggestions to better target left-handed students and more advanced students. A proposed revision for better fit and function for a duotang (a paper folder used to bind multiple pieces of loose-leaf paper with three metal fasteners) use was also explored, as teachers reported that, the left side of the worksheets are not fully visible when placed in a duotang.

To address these issues, the teachers had several excellent revision suggestions, including adding "models" to right side of each worksheet page for left-handed users, revising to fading interlines on the bottom lines to challenge more advanced students, and a left margin shift to accommodate for duotang use. Overly lengthy self-talk scripts were also touched upon.

b) Sub-theme - Expansions needed

In this last sub-theme, the need for additional program resources came across very clearly. This was seen in the classroom teachers' statements regarding the students' frustration that appeared to be noted when introducing printing:

> *"They are frustrated at first. I find any kind of printing with kids is a little*
> *tricky…as they get into it now it is a little easier, [but] there were tears*
> *in the beginning, it's hard, and whether it is kindergarten or grade one,*
> *I know that this [program] is [designed] mostly for grade one [and two],*
> *[but] learning how to hold a pencil for a lot of kids is a struggle". - Ms Arleen*

Additionally, the option to access personalized worksheets, especially name worksheets, arose in discussion. Teachers reported that creating personalized worksheets by cutting and pasting is very time-consuming. They felt that learning to print your name is very meaningful and important.

Discussion

This study outlines that teachers perceive that the *Printing Like a Pro!* program is easy to use, straightforward, and intuitive. These findings are encouraging, as ease of use, simplicity, and intuitiveness are major factors in adoption and use of a new tool or program (Rogers, 1995). New products and tools that are simpler to use and are compatible with existing values are adopted and implemented more rapidly than innovations that require the user to develop new or complex skills (Rogers, 1995). Therefore, findings indicate that the program has the potential to be widely adopted within and across grade levels (Asher, 2006) to encourage greater universal use and consistency in teaching, especially for those students who struggle with handwriting. Consistent use of the program may help to address the funding gap and limited OT intervention services that exist in many settings. Parent ease of access and use was also perceived to be important by the classroom teachers. Parental engagement in students' learning in the home contributes to student achievement (Harris and Goodall, 2008) and thus OTs, collaboratively with teachers, can further explore effectiveness of home-based, parent-involved handwriting intervention.

Classroom teachers perceive the program to be effective. They observed first-hand the results of the program, including generalization of skills learned to classroom writing. The degree to which the results are visible to others also factors positively into adoption and use (Rogers,1995). Further, the teachers appreciated the opportunities for student self-evaluation and substantial

practice by using the many and varied worksheet sets. As task-specific handwriting practice is an essential ingredient for improving handwriting (Hoy et al, 2011), use of an effective group delivery method within the school schedule allows for reliable, consistent practice times and intervention for a greater number of students (Cramm and Egan, 2015). By providing a classroom-based systematic handwriting curriculum, more children benefit than the traditional direct or consultative service delivery model, allowing challenges to be more universally addressed within the school system (Kennedy et al, 2018; Laverdure and Wilmer, 2018).

The inexpensive nature of the program was also regarded as a relative advantage, which I nfluences adoptability (Rogers, 1995) and use of the program in the classroom. Financial barriers can affect how readily schools and classroom teachers access and trial new classroom tools. This program is low risk and inexpensive to trial and use; the worksheets are free and were designed to be used with minimal training and support from OTs. Teacher and parent instructions are available directly on the website. Therefore, the programs' economical nature allows for more equitable access for all schools, regardless of socioeconomic circumstances or financial constraints.

Study findings add to OTs' understanding of how teachers choose handwriting programs and how to better support school-wide use in the classroom. Classroom teachers valued this program due to its flexibility, use of self-evaluation, and substantial opportunities for printing practice. Overall, teachers found the program to be easy to use and effective. Findings are consistent with previous literature that suggests that teachers find merit in programs that meet the needs of their students, are effective, and easy to implement (Benson et al, 2010). However, study findings also showed that teachers felt that there was limited awareness of the program. Thus, there is a need to improve dissemination, with OTs advocating for evidence-based handwriting resources and providing training for enhanced knowledge and use by classroom teachers.

Teachers identified the need for program revisions and enhancement. The teachers' concern that some of the self-talk scripts are too complicated led the authors to revise the self-talk scripts to be more succinct. Additional recommendations of adding right-sided models and a left margin shift to accommodate duotang use were also implemented.

As this program was designed for one-on-one guided use by grade one and two students (Zwicker and Montgomery, 2012), it is not surprising that kindergarten students would find the worksheets challenging. Children are not developmentally ready for structured handwriting instruction until the latter part of the kindergarten year (Weil and Amundson, 1994). To address the needs of younger students, a *Kindergarten version* has been developed and a pre-printing set of worksheets will be developed in the future (*Preparing to Print Like a Pro!*). Students in kindergarten could engage in these worksheet sets, in preparation for the existing program. These added sets of worksheets could better prime for learning to print in grade one. Lastly, the option to access personalized worksheets, especially student name worksheets, have been added to the website.

This study is not without limitations. The small sample was largely due to the timing of the focus groups being near the busy end of the school year. While we as the developers of the program conducted the study, we had a neutral third party moderate the focus group; we also have no financial gain from this research because the printing program is free. Nevertheless, replication of this study with a larger participant number by independent researchers to carry out and analyse the data would help to increase confidence in transferability of findings to other teachers and school districts. While we have examined the effectiveness of using *Printing Like a Pro!* in a printing club format to improve handwriting legibility (Montgomery and Zwicker, 2019), pairing the qualitative findings of the current study with additional quantitative research of this program would provide more substantial evidence to support widespread use of this program.

Conclusions

This qualitative focus group study generated new knowledge, awareness, and understanding of classroom teachers' perceptions of the freely available *Printing Like a Pro!* program. Teachers find the program to be inexpensive, intuitive and easy to use, and effective in improving printing skills. Suggestions from their experience in using the program will further enhance and expand program resources. Findings of this study support the need for OTs to build teacher capacity regarding handwriting instruction and remediation, such as delivering inservice training about this evidence-informed printing program. Translating findings into practice will assist in broader, more consistent adoption of the *Printing Like a Pro!* program to support all students, but especially the many students who struggle with handwriting. With support from OTs, teachers can become more knowledgeable and have evidence-based, easy to use, inexpensive tools readily available, so that handwriting difficulties can be ameliorated sooner to help prevent secondary academic challenges.

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Appendix
Printing Like a Pro! **Focus Group Question Guide**

Good afternoon and welcome to our session. Thanks for taking the time to join us to talk about the *Printing Like a Pro!* program. My name is Melinda Suto and assisting me is Sara Leckie. We're both with the University of British Columbia. Ivonne Montgomery and Jill Zwicker, the Occupational Therapists who co-developed the *Printing Like a Pro!* program have organized this focus group to get your perceptions and learn more about how you feel about the program. They want to know what you like, what you don't like, and how this program might be improved.

You were invited because you have experience in using the program in your classroom. There are no wrong answers but rather differing points of view. Please feel free to share your point of view even if it differs from what others have said. Keep in mind that we're just as interested in constructive feedback as positive comments.

You've probably noticed the tape-recorder/microphone as well as a note-taker. We're recording the session because we don't want to miss any of your comments. People often say very helpful things in these discussions and we can't write fast enough to get them all down. We will be on a first name basis, and we won't use any names in our summary documents. We would ask that you respect everyone's privacy by keeping this discussion confidential.

Just a few more housekeeping points: We ask that one person speaks at a time and that we all endeavour to give everyone gets a chance to speak. Having said that, anyone can pass on speaking. Please be respectful of everyone, make sure you leave enough time for others to speak. We ask that your turn off your phones or pagers. If you must respond to a call, please do so as quietly as possible and re-join us as quickly as you can. Are there any other housekeeping points that you would like to add in?

Well, let's begin. We are all wearing name tags to help us remember each other's names. Let's find out some more about each other by going around the table. Tell us your name and what grade level you currently teach.

Questions:
1. How did you first learn about *Printing Like a Pro!*?
   Prompt: How did you hear about it?

2. What made you decide to use it in your classroom?

3. What do you think about the *Printing Like a Pro!* program?
   Prompts:
   What is the effectiveness of *Printing like a Pro!* for the students in your classroom?
   What components of the program make it effective?
   Is there carryover from lesson to lesson and across subject areas?
   What is the ease of use of the program?
   Does it meet the needs of the students in your classroom?
   Is it time efficient?

4. Which parts of the program are most useful to you?
   Prompts:
   What is it about *Printing Like a Pro!* that you like?
   What do you like best about it?

5. Which parts of the program don't work well for you?
> **Prompts:**
> What don't you like about it?
> Are there any parts of the program that you are frustrated with?

6. How do your students respond to use of the program?
> **Prompts:**
> Which parts do they like the best?
> How child-friendly is the program?

7. How does *Printing Like a Pro!* compare to other printing programs you have used?
> **Prompt:**
> How would you describe *Printing Like a Pro!* in relation to these programs?

8. Do you have any suggestions to improve the *Printing Like a Pro!* program?

9. How "user-friendly" is the website that the resources are on? (http://www.childdevelopment.ca/SchoolAgeTherapy/SchoolAgeTherapyClassResources.aspx)

10. How understandable are the instructions for use of the program (School Staff)?

11. What further education and in-servicing do you need to help you best use *Printing Like a Pro!*?

12. What other resources should be developed?

13. Would you recommend *Printing Like a Pro!* to other classroom teachers? Why or why not?

14. Is there anything else that you want to tell us about *Printing Like a Pro!* that we haven't talked about already?

Thank you for sharing your experiences and opinions with us!