Doing the 'write' thing: handwriting and typing support in secondary schools in England

Emma Sumner , Ruth Nightingale , Karen Gurney, Mellissa Prunty and Anna L. Barnett

Abstract

Students must be able to produce legible and fluent text when completing classwork and for exam purposes. Some students, however, present with handwriting difficulties in secondary school. When these are significant, intervention may be necessary or alternatives to handwriting may be offered (e.g. use of a word processor). Little is known about current practice of supporting secondary students with handwriting difficulties in England and how recommendations are made to transition to typing. Semi-structured interviews were conducted with 13 practitioners with a responsibility for supporting students with handwriting difficulties. Two themes were identified. The first theme, 'doing the right thing', illustrated the tension between practitioners' commitment to supporting students with handwriting difficulties and their uncertainty around what is the 'right' approach. The second theme, 'influencing practice', described the contextual factors (student and family, school environment and national context) that impact on practitioners' practice and their decision to transition from handwriting to typing. Findings highlight the complexities of supporting this group of students and an urgent need for guidance at a national level to assist best practice. Implications for practice are discussed. Further research examining the effectiveness of handwriting interventions with secondary students and the optimum time to start typing is warranted.

Key words: handwriting, secondary school, support, typing, word processor

Introduction

Despite living in an increasingly digital age, handwriting remains the dominant modality for most students producing written work in the classroom and for examinations in primary and secondary schools in England. The importance of handwriting as a foundational skill for composing text has been depicted in writing frameworks (see Berninger and Amtmann, 2003; Kim and Schnatschneider, 2017). In particular, frameworks suggest that as handwriting fluency increases, less cognitive attention is directed to the motor act, which in turn leaves more working memory resources to be devoted to higher-level tasks, such as idea generation. In support of this, studies have demonstrated that handwriting proficiency is associated with writing quality and how much a child writes in a given task (meta-analysis: Feng et al., 2019). Further emphasising the need for legible handwriting, research has shown how markers downgrade writing samples that are more effortful to read (illegible), regardless of their content (Graham et al., 2011).

Handwriting is a complex motor act that requires the integration of cognitive, linguistic and perceptual-motor skills (Van Galen, 1991). Although explicit instruction in handwriting only occurs in the first few years of learning to write (Dinehart, 2015), the development of handwriting proficiency is a continuous process and can take a long time. Indeed, many adolescents present with difficulties in writing at speed (Alves and Limpo, 2015), which can be a concern given the time pressure in school exams. Expectations for developing fluent and legible handwriting are observed in the primary school National Curriculum in England (Department for Education [DfE], 2013). However, handwriting is noticeably absent from the secondary curriculum (DfE, 2014), despite writing tasks at secondary school increasing in complexity and requiring students to write more autonomously. As exams at this level of education, arguably, carry greater weight in terms of access to participating in further study, it is critical that secondary age students have developed handwriting proficiency to be able to demonstrate their learning.

To date, research has largely focused on the nature of handwriting difficulties and handwriting instruction in primary school. Research has demonstrated

that children in England identified as having a special educational need (SEN), such as dyslexia (Sumner et al., 2014), developmental coordination disorder (Prunty et al., 2016) or autism (Dockrell et al., 2014), have marked difficulties with producing legible handwriting at speed, which in turn has been shown to impact on overall productivity and writing quality. Moreover, variations in handwriting practice and frequency of instruction have been reported by teachers in primary schools in England (Barnett et al., 2006; Dockrell et al., 2016) and the United States (Graham et al., 2008). That said, a large-scale survey of teachers in Germany reported handwriting problems to be more prevalent in secondary than in primary schools (Marquardt et al., 2016) and not specific to students with SEN. Illegible handwriting and slow handwriting were the most significant challenges observed at secondary school. Furthermore, Limpo and Alves (2017) revealed that handwriting difficulties in secondary school-aged Portuguese students was related to lower self-efficacy and avoidance of writing. The impact of poor handwriting may thus have implications for engagement in core school activities for older learners, suggesting that there is a need for understanding practices and provision for secondary students experiencing problems with handwriting.

There are two routes to supporting students with handwriting difficulties at secondary level. One option is that students receive handwriting intervention, which could take place outside of the classroom, in small groups or on an individual basis. Handwriting intervention may be provided by school staff (e.g. a teaching assistant [TA], Special Educational Needs Coordinator [SENCo], specialist teachers) or external specialist services, such as an occupational therapist (OT). Approaches taken may be considered 'bottom-up' (e.g. strengthening exercises, correcting grip) or 'top-down' (e.g. handwriting practice, such as working on letter formation, joining and speed) (Cramm and Egan, 2015). In support of the latter, Santangelo and Graham (2016) found that explicit and regular handwriting instruction with an emphasis on legibility and fluency results in substantial gains in handwriting performance and can improve written composition for both primary and secondary students. The nature of handwriting intervention, including the focus of teaching (e.g. bottom-up or top-down), intensity (e.g. how often, duration of sessions), delivery (e.g. by a TA, SENCo or OT) and adoption of specific intervention programmes offered in English secondary schools, is, however, unknown.

A second option is to offer an alternative to handwriting, such as the use of a word processor (i.e. typing) in class and for exam purposes. The Joint Council for Qualifications (JCQ), which regulates access arrangements in England, states that students are able to use a word processor for exam purposes if it reflects their normal way of working (JCQ, 2021, pp. 57). They also recommend that all schools have a policy for the use of a word processor. The SENCo typically sets the agenda for intervention within a school along with senior leaders (Oldham and Radford, 2011). The SENCo is involved in applying for access arrangements, alongside a specialist assessor who has the responsibility of assessing need, and together, they must ensure that a student's normal way of working is formally documented. Schools may use the graduated approach (the assess, plan, do, review cycle) to plan and monitor SEN support (as per the Code of Practice; DfE, 2015). Yet, not all students with handwriting difficulties will have a specific diagnosis of a SEN, and a diagnosis is not required for schools to suggest a transition to typing (JCQ, 2021).

The rationale for transitioning to typing has been suggested to alleviate any pain when using a pen or to counteract problems with legibility and speed (Van Leeuwen and Gabriel, 2007). Similar to research on handwriting, studies have shown that typing speed relates to writing outcomes, in terms of productivity and quality (Feng et al., 2019). Moreover, US students with handwriting difficulties aged 9–15 produced longer essays when typing rather than handwriting (Beers et al., 2017). However, it should be recognised that the two writing modes differ in terms of execution (i.e. the movements and coordination of the fingers and hands to complete the task) and spatial demands (i.e. the writing output next to the hand when handwriting or away from the hands and on a screen when typing). Therefore, a change in writing mode requires targeted support/training. Despite the growing popularity of technology, touch-typing instruction has been reported as lacking in schools in the United States (Poole and Preciado, 2016). At present, little is known about the decision-making process for suggesting that a student should type, rather than handwrite, in schools in England; nor the support offered in this respect.

Given that writing remains the main method of assessments in schools, one of the primary goals of practitioners should be to ensure that students are able to write effectively. The ability to write legible text and at speed is important for both keeping up with classwork and in timed examinations. Practitioners are faced with a difficult decision about whether to focus on handwriting intervention or to consider typing as an alternative for students that are struggling with handwriting. Various factors may influence this decision and how students continue to be supported to become proficient writers. The aims of this study were, therefore, to (1) understand teaching practitioners' current practice and identify support that is provided to secondary students with handwriting difficulties in

England and (2) identify contextual factors that influence practice and the decision to introduce typing as an alternative to handwriting.

Methods

A qualitative design was adopted to gain an in-depth understanding of teaching practitioners' perspectives of the support provided to students with handwriting difficulties. Ethical approval was obtained from the College of Health and Life Sciences Research Ethics Committee at Brunel University London. All participants provided written informed consent. Participants were assured of confidentiality and anonymity. Quotations presented in this paper are identified by the participants' numerical study identifier (1–13).

Participants

Convenience sampling was used to recruit participants with experience relevant to the study (Robinson, 2014). Teaching practitioners working in secondary schools in England with experience of supporting adolescents with handwriting difficulties and recommending typing were invited to contact the research team if they were interested in taking part in the study. Participants were recruited via various means: (1) relevant forums known to the researchers; (2) social media accounts; (3) if they had indicated they would be interested in sharing practice ideas from their school when completing an online survey exploring handwriting and typing as part of a related wider project; and (4) emails explaining the study sent to the SENCos of 70 secondary schools in geographical proximity to the research team. Recruitment occurred between August 2020 and October 2021. Although data collection took place during the Covid-19 pandemic, participants were asked to reflect on their typical practice. In total, 13 practitioners (10 in a SENCO role and 3 specialist assessors) were recruited (see Table 1).

Data collection

Individual, semi-structured interviews, following a topic guide were conducted. Questions addressed two broad areas: (1) identification, assessment and support of students with handwriting difficulties and (2) recommending typing as an alternative. Follow-up questions and probes were used to generate further explanation from participants. All interviews were carried out via videoconference. Interviews

Table 1: Participant characteristics.

Characteristics	Number of participants
Role	
SENCo[a]	10
Specialist assessor[b]	3
Type of school[c]	
Local authority maintained	1
Academy	6
Pupil referral unit	1
Independent	3
Working across range of schools	2
Region of England	
London	6
South-East (Hampshire, Oxfordshire, Surrey)	4
East (Bedfordshire, Hertfordshire)	3
Years worked in education[d]	
0–10[e]	2
11–20	1
21–30	6
31–40	1
>41	1

[a]One SENCo was also an assistant headteacher.
[b]Two specialist assessors worked across a number of schools.
[c]Types of school: Local authority maintained schools are state schools that follow the national curriculum; academy schools are state schools independent from the local authority (run by not-for-profit trusts) that can follow a different curriculum; pupil referral units are an alternative to mainstream state schools funded by the local authority and they must provide an alternative curriculum; independent schools are fee-paying schools and pupils do not have to follow the national curriculum.
[d]Data missing from two participants.
[e]Lowest number was 7 years.

lasted 25–60 min and were audio-recorded and transcribed verbatim.

Data analysis

Interview transcripts were analysed inductively using Braun and Clarke's (2021) reflexive thematic approach. Initial line-by-line coding across the whole dataset was first completed, and then initial codes were collated into potential themes. Members of the research team independently reviewed selected transcripts and

identified interesting features that informed theme development. Diagramming was used to develop a thematic map and explore the relationships between themes and sub-themes. NVivo software was used to code and manage data. The research team, who have professional backgrounds in psychology, special educational needs and occupational therapy, met regularly to discuss data collection and analysis.

Results

Two overarching themes, each composed of sub-themes, were identified. The first theme—doing the 'right' thing—explains current practice. This theme illustrates the tension between practitioners' commitment to supporting students with handwriting difficulties and their uncertainty around what is the 'right' approach to identifying, assessing, supporting and reviewing handwriting and typing. The second theme—influencing practice—describes the contextual factors (the student and their family, the school environment and the national context) that impact on practice and decision-making to transition from handwriting to typing. Figure 1 illustrates the themes and sub-themes and how contextual factors influenced whether practitioners were able to do what they perceived to be the 'right' thing.

Theme one: Doing the 'right' thing

Practitioners' commitment to 'doing the right thing' when supporting students with handwriting difficulties was evident in all of their accounts. Although some participants appeared more confident in their practice, others expressed uncertainty due to a lack of guidance and evidence. This ambiguity around what was best practice pervaded many aspects of their work with students with handwriting difficulties.

Identifying

Interview questions did not specifically focus on students identified with SEN. However, some participants did mention additional needs, such as dyslexia and 'dyspraxia' (developmental coordination disorder). There was variation and uncertainty around when and how to identify students with handwriting difficulties and who had responsibility for identification. Participants described how information handover from primary schools varied. Although some students with handwriting difficulties were identified as part of the transition process, this was mostly students with SEN; therefore, handover usually focused on students' other needs, and rarely handwriting. Some practitioners adopted a whole-class, proactive approach to identify students with handwriting difficulties. This involved screening all students in the first year of secondary school (Year 7, ages 11–12) and again in Year 9 (ages 13–14) using tools such as Exact (GL Assessment) to assess handwriting and typing speeds. Others described how all students were screened in Year 7, but only those with lower handwriting/typing speeds were reassessed in Year 9. As the screening assessments only focused on speed, some practitioners would then review all the handwriting samples for legibility. In contrast, some schools appeared to adopt a
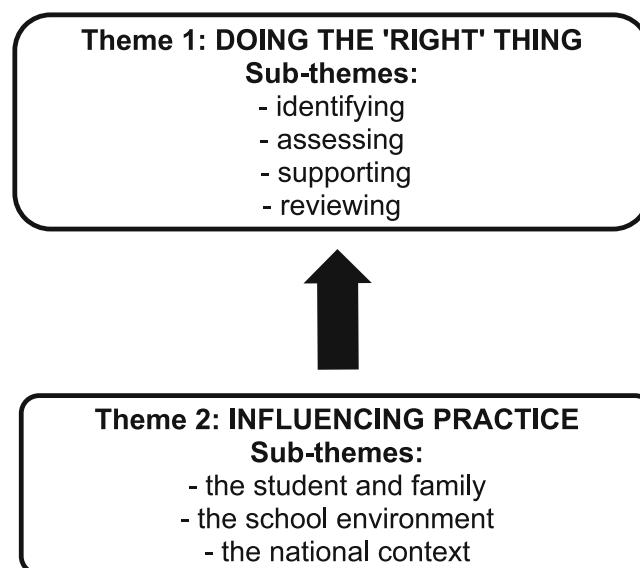

Figure 1: Supporting students with handwriting difficulties.

reactive approach that was dependent on class teachers identifying a student with handwriting difficulties. Compared to the screening assessments, class teachers mostly identified difficulties with legibility, rather than speed. This reactive approach meant identification and, critically, support occurred at a later timepoint [e.g. close to the formal examinations —General Certificate of Secondary Education (GCSE)—which are taken in Year 11 in secondary schools in England when students are aged 15–16]:

> *It's completely ad hoc, it's just people saying this child's got this, this child's got that. One action I'm going to take away from this conversation is thinking more strategically about early identification of handwriting difficulties. We need to be much more strategic about identifying it and having conversations with colleagues early on, with parents and the young person. And then making decisions earlier on, rather than it being when we get to GCSE level, because if they're going to use a laptop they need to be doing it earlier, so they get really comfortable with it.* (12)

Assessing

When a student had been identified as having handwriting difficulties, it was evident that different assessment methods were being used to gain further information. The decision whether to use standardised or informal approaches was based on various factors including whether they were considering support in the classroom or for written exams, whether they were assessing speed or legibility and their experience. Although practitioners primarily used standardised assessments, such as the Detailed Assessment of Speed of Handwriting (DASH; Barnett et al., 2007), to provide evidence of need for access arrangements, some used it to determine whether students met a 'threshold' for additional support or should transition to typing depending on their age and how close they were to the end of school exams:

> *I do the DASH test. If they got a low average or below average [score], that flags it up to me that a handwriting intervention might be appropriate, or dependent on the age of the student, if they're Years 10, 11 onwards, then I think it's too late by then, they're straight on the laptop.* (10)

When considering writing in class and legibility, practitioners mostly used informal assessments as they were confident that their own and colleagues'

professional judgement were sufficient to decide what support was needed:

> *I look at samples of their work and what letters they're having trouble with. I don't look at handwriting in isolation, I look at the content of their writing, spelling, dropped verb endings. The handwriting bit is usually quite obvious just by glancing, and any teacher can identify whether they can read something or not. If they can't read it, then there's a problem and it needs to be fixed.* (2)

Supporting

There was uncertainty among practitioners around whether doing the 'right' thing involved providing support with handwriting and variation in the amount and nature of support provided to students with handwriting difficulties. Participants reported that students in their schools did not receive input from OT services for handwriting difficulties unless the student had a medical condition or physical disability (e.g. cerebral palsy, Ehlers–Danlos syndrome). Some participants reported teaching handwriting skills as part of broader interventions to address literacy difficulties, whereas others implemented specific handwriting programmes such as 'Write from the start' (Teodorescu and Addy, 1996) and 'Speed up!' (Addy, 2004). Interventions varied and could involve practising letter formation, alongside trialling equipment with the aim of improving pen hold or posture. However, other practitioners queried whether teaching handwriting beyond primary school was effective:

> *By the time they get to secondary school, they have entrenched handwriting habits and to break that habit needs way more intensive support than we're able to offer. So that's the biggest barrier, I've never been able to make a handwriting intervention frequent enough to really make a difference. You see that they can improve, that they can create a piece of writing which is more legible or faster, but when you go back into the classroom, you look at their books, it's not sustained. So I feel like, why do we bother!* (13)

Indeed, a number of participants felt that having confirmed that a student had difficulties with handwriting speed and/or legibility, transitioning to typing appeared the most appropriate next step to support students (e.g. 'usually the only solution is a laptop' (12)). The benefit of developing touch-typing skills

early on in secondary school for those with handwriting difficulties was recognised:

> If we've spoken to primary school and they've highlighted issues with handwriting, we shift completely over to using laptops and touch typing, we don't do any work on handwriting at all. (1)

However, there was disparity in the support provided with the transition to typing. Some schools adopted a whole school approach to teaching touch-typing; some provided extra-curricular touch-typing clubs, whereas others signposted students and their parents to online touch-typing programmes to complete outside of school. In addition to touch-typing, some practitioners also supported students to learn skills such as saving documents and using folders to organise their class work. The lack of systematic touch-typing interventions used in practice was also acknowledged:

> If we see they've got really slow handwriting and really slow typing we're like, 'you need to start using a laptop now!' We encourage that across the board. But we don't necessarily have an intervention to help them get better at their typing, we just hope for the best! (13)

Reviewing

Although only one participant referred explicitly to using the 'assess, plan, do, review approach', as per the SEND Code of Practice (DfE, 2015), most practitioners described monitoring a student's progress once support had been implemented. The uncertainty around best practice was evident though, especially for students who had changed to typing. Some described regularly monitoring typing speed and accuracy; however, due to time pressures and the belief that most students were 'tech-savvy' (5), others rarely reviewed a student's progress unless specific concerns were raised. As one practitioner explained, students who transitioned to typing needed support and monitoring for it to be a viable alternative:

> The laptop is often seen as the solution to a lot of handwriting problems but it's not given the priority that it should be early enough, for it to be a solution. There are those students that typing doesn't work for either. So if you leave it to the last minute, find it doesn't work and then you drop them back in just before GCSEs [formal exams], and say, 'We don't think typing is helping you, you've got to go back to handwriting'. (3)

Theme two: Influencing practice

The second theme explains how multiple factors such as the student, the family, the school environment and national context, appeared to impact on practitioners' practice, decision-making and capacity to do the 'right' thing.

The student and family

The age and gender of a student, and whether they had additional difficulties, impacted on decision-making about whether to provide handwriting support or transfer a student to typing. Some participants advised that students with handwriting difficulties in Year 7 should start typing 'straightaway' (10) to develop typing proficiency before final year exams, whereas others initially provided handwriting support and transitioned students to typing in Year 9. While participants acknowledged potential gender stereotypes, they perceived boys' and girls' motivation to handwrite varied, which, in conjunction with a student's age, could influence their decision to provide a handwriting intervention or introduce typing. This was evident in one participant's account as they compared their current experience of working in a girls' school with previously working in a boys' school:

> Without being sexist, a lot of girls really mind about presentation, especially if the other girls can do it. A lot of the boys couldn't care less about presentation, it's not a priority in their life. … in my school now with the girls, definitely I would [do a handwriting program], but with the boys there [previous school] it didn't seem appropriate. I think they would have been less receptive to that. (10)

Participants noted that some students with handwriting difficulties presented with additional needs including spelling, coordination or organisation difficulties. Considering a student's needs holistically could make decision-making around doing the 'right' thing more complex:

> The majority of students who need to use laptops they're really disorganised. Having a laptop is an extra demand on their organisational skills. It's really hard, because you're saying, this is really useful, this will mean teachers can read your work and you might be more productive, but you're also saying, you need to come and collect a laptop, sign it out and take it to your lesson. There's so many things involved, it's a big responsibility for them. (11)

Practitioners were aware of both the student's and their parent's motivation and attitudes towards handwriting and typing when determining what support to provide. Although practitioners recognised many students experienced typing as a 'relief' (1), they understood some students were reluctant to type as they perceived it to be stigmatising. Parents' motivations could differ to the students, although practitioners found most parents were receptive to their child typing as they viewed it as a life skill. When introducing typing, practitioners encouraged students and parents to be 'on board' (4) by focusing on how typing would enable the student to demonstrate their knowledge:

> We always encourage our young people and parents to view it that if we're using laptops that it is because assessments are supposed to judge what you know, they're not a judgement on your handwriting speed or handwriting style. (1)

The socio-economic status and resources available to a student's family were also perceived by practitioners to influence practice; for example, some parents were more able to approach the school to raise concerns about their child's handwriting or purchase a laptop for their child. Practitioners described the strategies adopted to address these inequalities, including whole-class handwriting screening and loaning laptops to students; however, they were aware that disparity in provision continued to exist, often as a result of the variation in school environments.

The school environment

Factors within the school context, such as the practitioners' experience and values, impacted on practice and decision-making. Many participants had significant experience of supporting students with handwriting difficulties, and although experience was a critical influence on practice, their values also appeared to guide decision-making. Practitioners' provision of handwriting interventions seemed to be related to whether they considered handwriting a 'life skill' (8) or a 'dying art' (13). The tension between their own and colleagues' values, their experience, and commitment to doing the 'right' thing was evident in their accounts:

> For years and years, my belief has been that we must try and correct their handwriting. But it's really hard in secondary school to do a consistent handwriting intervention, so unfortunately what you end up doing, well maybe fortunately, is trying to get them typing rather than handwriting. My colleagues don't see it like I do. They think that as long as they [students] can just get by and write, it doesn't matter if they print or whatever. (8)

As the quotation suggests, practitioners' practice was influenced by the experience and values of colleagues. In schools that did not complete whole-class screening for handwriting difficulties, practitioners described how they were reliant on co-workers to identify students that needed additional support. Although schools had policies and implemented systems for staff to raise concerns about students with handwriting difficulties, practitioners were aware that there was inequity:

> My concern is not so much about the ones who get the laptop, it's all the ones who haven't got it. I think why is it I know about you? Is it because you happen to have Mrs X, but if you had Mr Y he would never have noticed and never have told me? Then it's not fair. (11)

Participants described how teachers would usually accommodate students typing in class, and school laptop policies supported this by providing guidance on laptop use for both classwork and in exams. Resources varied significantly depending on the type of school and impacted on practitioners' practice. The amount of finance, equipment and number of staff available influenced laptop provision, touch-typing programmes, delivery of handwriting interventions and the type/nature and extent of assessments conducted. When asked about the factors affecting the introduction of typing, one participant explained how limited finance and equipment made decision-making more challenging:

> How many laptops are available! Money, frankly, honestly, that's the way it is. And if you haven't got enough technology, then who trumps who? We have Key Stage 4 [the final two years of secondary school, pupils aged 14–16] prioritised over Key Stage 3 [the first three years of secondary school, pupils aged 11–14] because of exams. (5)

The national context

Practice also appeared to be influenced by the national agenda and societal changes around technology. Participants valued the guidance and formal processes provided by the JCQ requirements around identifying students with handwriting difficulties to use a word

processor for their GCSE exams. Specifically, they described how the JCQ requirements to use specific handwriting assessments to determine need, to have a school word processing policy and to collate evidence that typing was a student's normal way of working when applying for access arrangements for written examinations, had a positive impact on their practice. However, participants also acknowledged that the absence of handwriting in the national curriculum for secondary schools, the targets set by government and the focus of school inspections meant handwriting and touch-typing was not a priority. This consequently impacted on the support they could provide:

> There's so much to do in terms of children who can't read, we're struggling to meet those needs, let alone the handwriting difficulties. In terms of the city, the powers that be, and OFSTED, all those kinds of things, when they come in, they want to know your data for reading, your data for maths, but nobody cares what children's handwriting skills are like. (12)

Some participants suggested touch-typing should be a part of the national curriculum, and if introduced in primary school, it would support typing to become a student's normal way of working and reduce the stigma some students experienced as the only student in the class using a laptop. Practitioners' awareness of societal changes and the increasing use of technology also shaped practice and decision-making. The understanding that many students were more likely to type rather than handwrite once they left school meant typing was often viewed as a life skill:

> Most people realise now that we don't actually do much handwriting on a day-to-day basis. The majority of our work is through mobile phone texting, emailing, writing documents etc., you're not writing. (4)

Discussion

This study aimed to identify how practitioners in England support secondary students with handwriting difficulties, with a particular focus on how decisions are made to suggest typing as an alternative to handwriting. Greater awareness of current practice is important to understand practitioners' decision-making and to identify where further guidance, training and research may be needed.

The first theme—*doing the 'right' thing*—highlighted a tension between being committed to supporting students with handwriting difficulties and ambiguity around what constitutes best practice. Variation in practice was observed in the approaches taken to identify, assess, support and review students with handwriting difficulties, pointing towards a lack of clear guidance to schools. Practitioners reported taking either a proactive or a reactive approach to identifying handwriting difficulties, the former requiring whole-class screening of handwriting (and in some cases typing) speed and the latter relying on class teachers to identify illegible handwriting from students' class books. The use of different standardised or informal assessments was noted. Further, mixed practice in supporting the development of handwriting skills was evident, with some embedding handwriting practice within other literacy interventions and others mentioning specific handwriting programmes. The existing evidence base recognises the benefit of explicit handwriting instruction (i.e. practising letter formation; Santangelo and Graham, 2016), which encouragingly was mentioned by those participants that delivered handwriting interventions. However, a number of practitioners took the approach to recommending typing straight away, instead of dedicating time to improving handwriting.

One striking finding was the uncertainty in recommending typing as an alternative and the differences in approaches to support the development of typing skills. It was evident that the decision to support secondary students with handwriting difficulties was largely motivated by preparation for exams. The decision to introduce typing as an alternative was mentioned if students were close to the final exam period, or some suggested introducing typing at the beginning of secondary school to allow time for students to become fluent typists by the final year exams. Research supports the idea that students need to automatise typing but also that typing skills steadily increase with age and experience and often lags behind handwriting speed (Freeman et al., 2005; Connelly et al., 2007). A relationship between typing speed and quality of writing is often found (Goldberg et al., 2003), with faster typists producing higher-quality written work. Observations have also revealed how children new to typing often focus on key finding rather than the composition of the text (Johansson et al., 2010). It has been argued that the cognitive load of touch-typists who have automatised the fine motor act of typing is lower than that of students who type using a visually guided strategy (e.g. searching for each key), allowing more cognitive resources to be devoted to text-making and resulting in better compositions (van Weerdenburg et al., 2019). This may provide support for developing typing skills early on, though further research is warranted.

The second theme from the data—*influencing practice*—highlighted the many contextual factors influencing the support offered to students with handwriting difficulties. Practitioners suggested that there were student-level factors, such as age, gender and the presence of additional needs that would be considered in the decision-making process of whether to persevere with handwriting or offer typing as an alternative. This is similar to the findings reported in a recent study on the work of OTs with secondary school students with handwriting difficulties (Nightingale et al., 2002). OTs described a child-centred approach to decision-making around the recommendation of typing, considering motivation, the effect on well-being and the need for a functional method to record schoolwork. This approach to match support to need is supported by research on students in higher education with handwriting difficulties. Rosenberg-Adler and Weintraub (2020) found that while most students benefited from using a word processor, a subgroup were still found to struggle with typing. Specifically, the linguistic challenges that some students experience (i.e. spelling difficulties) can constrain both handwriting and typing performance and may warrant a different approach to intervention. This highlights that the transition to typing may not be a 'one-size-fits-all' and different students may benefit from particular provision. In addition, as also reported by OTs in Nightingale et al. (2002) practitioners in the present study recognised the need to reduce stigma, which may be observed when a student starts to use a word processor and they then feel different to their peers who are still using handwriting in the classroom.

In relation to resources, the school context was recognised as a factor in the decision-making process for supporting students with handwriting difficulties. It was acknowledged that finding staff time to devote to handwriting intervention was often not possible, but also funding and access to laptops for all students that need them can be lacking in schools (Julius and Sims, 2020). The final contextual factor was the national agenda. Schools in England are guided by the JCQ requirements to assess need and record students' usual way of working for those seeking access arrangements for exam purposes. However, more broadly, teaching practitioners alluded to the lack of any mention of handwriting and touch-typing in the secondary curriculum. This reduced their perceived importance as the focus of interventions at this stage of education. Yet, we know from the research evidence that there is a relationship between transcription skills and writing outcomes (Feng et al., 2019), and thus, it can be argued that supporting handwriting and/or typing should be on the agenda in secondary schools.

The findings point towards two key implications for practice. The first is the need for clear guidelines/recommendations for schools to identify, assess, support and review students with handwriting difficulties and for suggesting typing as an alternative provision. The aim of these guidelines would be to assist the decision-making process. Importantly, such guidelines should be available for—and tailored to—both primary and secondary school settings given the different approaches to supporting transcription skills, and with the intention of 'catching' (identifying and supporting) children that are struggling at an early age, as well as to know how to support older learners with persistent difficulties. OTs are uniquely skilled in analysing task performance and identifying where and when a task breaks down. Related to handwriting, OTs have an understanding of factors related to the child, the task and the environment and can make recommendations and adjustments to support skill acquisition. Yet, interestingly, teaching practitioners interviewed in the present study suggested that they do not receive support from OTs to provide handwriting intervention. To address how to support students with handwriting difficulties, collaboration with relevant professionals is warranted, and this could be achieved in initial professional training and as part of continued professional development (CPD). Teachers have previously expressed a desire for OT input to inform the teaching of handwriting in schools in Ireland (Patton et al., 2015). Indeed, a 2016 position statement from the World Federation of Occupational Therapy (WFOT) emphasised the importance of occupational therapists in schools to support participation in school-based tasks, including writing (WFOT, 2016). While the WFOT position statement is being adopted in the United Kingdom, OTs have highlighted variation in the practice of those supporting students with handwriting difficulties (Nightingale et al., 2002). As such, there is a real need for standardised, clinical guidelines to support consistency and best practice. The guidelines should be inter-disciplinary, incorporating evidence-based principles from occupational therapy and evidence around what works in practice to inform future teacher CPD (e.g. Santangelo and Graham, 2016).

The second practical implication relates to technology, and particularly resources and training for the student. If students are being recommended to transition to typing their classwork and for exams, technology should be readily available and touch-typing instruction should be provided. Touch-typing is not yet part of the school curriculum in most countries (van Weerdenburg et al., 2019), but students need to become fluent typists if that is their main mode of writing. It is often assumed that children are 'digital natives', but this is not always the case and digital literacy skills

need to be taught (van Dijk, 2020). With discussions around moving towards digital examinations in the coming years (DfE, 2022), as well as a reported increase in requests to use a word processor in exams post-pandemic (Communicate-ed, 2022), schools should have a policy for supporting touch-typing to invest in a future-focused approach to learning. The Covid-19 pandemic highlighted digital inequalities exist across the United Kingdom, with many schools lacking access to technology as well as students lacking digital literacy skills (Coleman, 2021). Of note, the present study took place during the pandemic, but participants referred to their practice generally, not their experience of the pandemic. That said, problems with students accessing laptops when they have been recommended to type their classwork were acknowledged. Further funding is required to ensure access to technology and reduce digital exclusion.

Some limitations to the present study can be acknowledged. Participants were not explicitly asked about training for supporting handwriting difficulties, yet the findings point towards differences in confidence in supporting students in this respect. Moreover, participants were largely restricted to the South or East of England. The 'postcode lottery' of support for students has been identified by Hutchinson (2021). Future research could consider a survey approach to understand how much relevant training practitioners have had to support handwriting difficulties and how that relates to their approach taken. It would also be beneficial to capture current practice of schools across England. Further, we acknowledge that the present sample likely had some degree of interest in special educational needs. It would be interesting to explore the issues raised with a wider variety of secondary school teachers—particularly around identification of handwriting difficulties and awareness of school policy to support these individuals—to better understand school processes. In addition, the Code of Practice (DfE, 2014) states the importance of the parent and pupil voice in the decision-making process for supporting areas of need; thus including the parent and student voice would further our understanding of best practice. Moreover, there is an urgent need for empirical research that examines the effectiveness of handwriting interventions with secondary students and the optimum time for students to start typing to inform best practice guidelines.

To conclude, practitioners interviewed in the present study were committed to supporting secondary students with handwriting difficulties, but variations in practice were observed. Also, uncertainty was expressed around how best to support these students—in terms of making the decision to teach handwriting or suggest that a student transitions to typing their classwork. A number of contextual factors were identified as influencing practice, such as student-level factors, the school environment and the national agenda. The importance of developing fluent transcription skills should not be overlooked in secondary school students. Closer collaboration between teachers and occupational therapists may prove effective, particularly if best practice guidelines could be developed. Similarly, it may be helpful if schools reflect on the availability of technology and consider training for touch-typing to ensure that students are fully supported. Further research is warranted to identify the impact of handwriting difficulties on attainment at this level and to better understand how to support students that struggle in this respect.

Acknowledgements

Conflicts of interest

Nothing to disclose.

Funding

Ethics approval

Ethical approval was obtained from Brunel University London research ethics committee (19318-MHR-Feb/2020-24671-2).

Data availability statement

The research data will not be shared due to possible identification of participants.

References

ADDY, L. (2004) *Speed Up! A Kinaesthetic Programme to Develop Fluent Handwriting*. Cambridge, UK: LDA.

ALVES, R. A. and LIMPO, T. (2015) Progress in written language bursts, pauses, transcription, and written composition across schooling. *Scientific Studies of Reading*, 19, pp. 374–391. https://doi.org/10.1080/10888438.2015.1059838

BARNETT, A. L., HENDERSON, S., SCHEIB, B. and SCHULZ, J. (2007) *Detailed Assessment of Speed of Handwriting.* London: Pearson Clinical.

BARNETT, A. L., STAINTHORP, R., HENDERSON, S. and SCHEIB, B. (2006) *Handwriting Policy and Practice in English Primary Schools: An Exploratory Study (Issues in Practice).* London: Institute of Education, University of London.

BEERS, S. F., MIKAIL, T., ABBOTT, R. and BERNINGER, V. W. (2017) Effects of transcription ability and transcription mode on translation: evidence from written compositions, language bursts, and pauses when students in grades 4 to 9, with and without persisting dyslexia or dysgraphia, compose by pen or by keyboard. *Journal of Writing Research*, 9, pp. 1–25.

BERNINGER, V. W. and AMTMANN, D. (2003) 'Preventing written expression disabilities through early and continuing assessment and intervention for handwriting and/or spelling problems: research into practice', in H. L. SWANSON, K. R. HARRIS, S. GRAHAM (Eds.) *Handbook of Learning Disabilities.* New York: The Guilford Press, pp. 345–363.

BRAUN, V. and CLARKE, V. (2021) *Thematic Analysis: A Practical Guide.* London: SAGE Publications.

COLEMAN, V. (2021). Digital divide in UK education during COVID-19 pandemic: literature review. Cambridge Assessment Research Report. Cambridge, UK: Cambridge Assessment.

Communicate-ed. (2022) The impact of the pandemic on requests for access arrangements. https://www.communicate-ed.org.uk/communicate-ed-membership/the-impact-of-the-pandemic-on-requests-for-access-arrangements

CONNELLY, V., GEE, D. and WALSH, E. (2007) A comparison of keyboarded and handwritten compositions and the relationship with transcription speed. *British Journal of Educational Psychology*, 77, pp. 479–492.

CRAMM, H. and EGAN, M. (2015) Practice patterns of school-based occupational therapists targeting handwriting: a knowledge-to-practice gap. *Journal of Occupational Therapy, Schools & Early Intervention*, 8, pp. 170–179.

Department for Education. (2013) National curriculum in England: primary curriculum. Key stages 1 and 2 framework document. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/425601/PRIMARY_national_curriculum.pdf

Department for Education. (2014) National curriculum in England: primary curriculum. Key stages 3 and 4 framework document. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/840002/Secondary_national_curriculum_corrected_PDF.pdf

Department for Education. (2015) Special educational needs and disability code of practice: 0 to 25 years. https://www.gov.uk/government/publications/send-code-of-practice-0-to-25

Department for Education. (2022) Exploring the role of technology in exams and assessments. https://educationhub.blog.gov.uk/2022/05/06/exploring-the-role-of-technology-in-exams-and-assessment-online-exams/

DINEHART, L. H. (2015) Handwriting in early childhood education: current research and future implications. *Journal of Early Childhood Literacy*, 15, pp. 97–118.

DOCKRELL, J. E., MARSHALL, C. R. and WYSE, D. (2016) Teachers' reported practices for teaching writing in England. *Reading and Writing*, 29, pp. 409–434. https://doi.org/10.1007/s11145-015-9605-9

DOCKRELL, J. E., RICKETTS, J., CHARMAN, T. and LINDSAY, G. (2014) Exploring writing products in students with language impairments and autism spectrum disorders. *Learning and Instruction*, 32, pp. 81–90.

FENG, L., LINDNER, A., JI, X. R. and JOSHI, R. M. (2019) The roles of handwriting and keyboarding in writing: a meta-analytic review. *Reading and Writing*, 32, pp. 33–63.

FREEMAN, A. R., MACKINNON, J. R. and MILLER, L. T. (2005) Keyboarding for students with handwriting problems: a literature review. *Physical & Occupational Therapy in Pediatrics*, 25, pp. 119–147.

GOLDBERG, A., RUSSELL, M., COOK, A. and RUSSELL, E. M. (2003) The effect of computers on student writing: a meta-analysis of studies from 1992 to 2002. *Journal of Technology, Learning and Assessment*, 2, pp. 2–51.

GRAHAM, S., HARRIS, K., & HEBERT, M. A. (2011). Informing writing: the benefits of formative assessment. A Carnegie Corporation Time to Act report. Washington, DC: Alliance for Excellent Education.

GRAHAM, S., HARRIS, K. R., MASON, L., FINK-CHORZEMPA, B., MORAN, S. and SADDLER, B. (2008) How do primary grade teachers teach handwriting? A national survey. *Reading and Writing*, 21, pp. 49–69.

HUTCHINSON, J. (2021) Identifying pupils with special educational needs and disabilities. Education Policy Institute. https://www.nuffieldfoundation.org/wp-content/uploads/2021/03/Identifying-SEND-pupils.pdf

JOHANSSON, R., WENGELIN, Å., JOHANSSON, V. and HOLMQVIST, K. (2010) Looking at the keyboard or the monitor: relationship with text production processes. *Reading and Writing*, 23, pp. 835–851. https://doi.org/10.1007/s11145-009-9189-3

Joint Council for Qualifications. (2021). Access arrangements and reasonable adjustments. https://www.jcq.org.uk/wp-content/uploads/2021/11/AA_regs_21-22_FINAL.pdf

JULIUS, J., & SIMS, D. (2020). Schools' responses to Covid-19: Support for vulnerable pupils and the children of keyworkers. National Foundation for Educational Research.

KIM, Y.-S. G. and SCHNATSCHNEIDER, C. (2017) Expanding the developmental models of writing: a direct and indirect effects model of developmental writing (DIEW). *Journal of Educational Psychology*, 109, pp. 35–50.

LIMPO, T. and ALVES, R. A. (2017) Relating beliefs in writing skill malleability to writing performance: the mediating role of achievement goals and self-efficacy. *Journal of Writing Research*, 9, pp. 97–125. https://doi.org/10.17239/jowr-2017.09.02.01

MARQUARDT, C., MEYER, M. D., SCHNEIDER, M. and HILGEMANN, R. (2016) Learning handwriting at school - a teachers' survey on actual problems and future options. *Trends in Neuroscience and Education*, 5, pp. 82–89. https://doi.org/10.1016/j.tine.2016.07.001

NIGHTINGALE, R., SUMNER, E., PRUNTY, M. and BARNETT, A. L. (2002) Handwriting and typing: occupational therapy practice when supporting adolescents with handwriting difficulties. *British Journal of Occupational Therapy*, 85.11, pp. 891–899. https://doi.org/10.1177/03080226221097314

OLDHAM, J. and RADFORD, J. (2011) Secondary SENCo leadership: a universal or specialist role? *British Journal of Special Education*, 38, pp. 126–134.

PATTON, S., HUTTON, E. and MACCOBB, S. (2015) Curriculum differentiation for handwriting and occupational therapy/teacher partnership: collaboration or conflict? *Irish Educational Studies*, 34, pp. 107–124.

POOLE, D. M. and PRECIADO, M. K. (2016) Touch typing instruction: elementary teachers' beliefs and practices. *Computers & Education*, 102, pp. 1–14.

PRUNTY, M. M., BARNETT, A. L. and WILMUT, K. (2016) The impact of handwriting difficulties on compositional quality in children with developmental coordination disorder. *British Journal of Occupational Therapy*, 79, pp. 591–597.

ROBINSON, O. C. (2014) Sampling in interview-based qualitative research: a theoretical and practical guide. *Qualitative Research in Psychology*, 11, pp. 25–41.

ROSENBERG-ADLER, T. and WEINTRAUB, N. (2020) Keyboarding difficulties: frequency and characteristics among higher education students with handwriting difficulties. *Learning Disabilities Research and Practice*, 35, pp. 82–88.

SANTANGELO, T. and GRAHAM, S. (2016) A comprehensive meta-analysis of handwriting instruction. *Educational Psychology Review*, 28, pp. 225–265. https://doi.org/10.1007/s10648-015-9335-1

SUMNER, E., CONNELLY, V. and BARNETT, A. L. (2014) The influence of spelling ability on handwriting production: children with and without dyslexia. *Journal of Experimental Psychology: Learning Memory and Cognition*, 40.5, pp. 1441–1447.

TEODORESCU, I. and ADDY, L. (1996) *Write from the Start: Unique Programme to Develop the Fine Motor and Perceptual Skills Necessary for Effective Handwriting*. Cambridge, UK: LDA.

VAN DIJK, J. (2020) Closing the digital divide: The role of digital technologies on social development, well-being of all and the approach of the Covid-19 pandemic. https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/07/Closing-the-Digital-Divide-by-Jan-A.G.M-van-Dijk-.pdf

VAN GALEN, G. P. (1991) Handwriting: issues for a psychomotor theory. *Human Movement Science*, 10, pp. 165–191. https://doi.org/10.1016/0167-9457(91)90003-G

VAN LEEUWEN, C. A. and GABRIEL, M. A. (2007) Beginning to write with word processing: integrating writing process and technology in a primary classroom. *The Reading Teacher*, 60, pp. 420–429.

VAN WEERDENBURG, M., TESSELHOF, M. and VAN DER MEIJDEN, H. (2019) Touch-typing for better spelling and narrative-writing skills on the computer. *Journal of Computer Assisted Learning*, 35, pp. 143–152.

WORLD FEDERATION OF OCCUPATIONAL THERAPISTS. (2016) Position statement on occupational therapy services in school based practice for children and youth. http://www.wfot.org/ResourceCentre.aspx (filter for Position Statements).

CONTACT THE AUTHORS

Emma Sumner, Department of Psychology and Human Development, IOE, Faculty of Education and Society, University College London, London WC1H 0AA, UK.
email: e.sumner@ucl.ac.uk

Ruth Nightingale, Division of Psychology and Language Science, Language and Cognition Department, University College London, London, UK;
Division of Occupational Therapy, Department of Health Sciences, College of Health Medicine & Life Sciences, Brunel University London, Uxbridge, UK

Karen Gurney, Centre for Psychological Research, Oxford Brookes University, Oxford, UK

Mellissa Prunty, Division of Occupational Therapy, Department of Health Sciences, College of Health Medicine & Life Sciences, Brunel University London, Uxbridge, UK

Anna L. Barnett, Centre for Psychological Research, Oxford Brookes University, Oxford, UK