

## Just Say It: Voice Recognition for Empowering Student and Educator Learning

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Sabbatical Report / Bruce Warren / September 2017

### At a glance

Too many children learn early about failure at school and this is often because they struggle with the mechanics of writing. The author has worked with some of these children and recommends Google Voice typing. This is a free tool and anecdotal evidence indicates it can make a significant difference for reluctant writers. It makes sense to purchase headsets (suggested five headsets per classroom) to improve accuracy when there is background noise and to use quiet break out spaces. A recommendation is also made for educators to try voice recognition software if they wish to improve output for email, blogging and other writing.

### Intent

- Research the effective use of the latest voice recognition software in educational contexts;
- Visit schools and universities in this country and in United Kingdom that use the latest voice recognition technology to improve learning and productivity;
- Trial the use of voice recognition software with priority learners in my own school; and
- Prepare a useful report to inform colleague principals.

### Purpose

Too many children learn early about failure at school and this is often because they struggle with the mechanics of writing. Pencil grip, letter formation, keyboard skills, sound to letter associations, spelling, punctuation.... The frustrations getting thoughts on paper are too great. They give up. They avoid writing. Imagine a NEW situation where all the ideas a child can talk about are captured in print by the technology. The learner can then sustain the enthusiasm and put the effort in at the editing stage. Just say it! I planned to learn about how we can better support reluctant writers using this state of the art technology.

The principal's workload is significant and some of us are 'hunt and peck' typists. Imagine how much more productive we could be if we simply talked to our laptops. I aimed to learn how I can further improve my self-efficacy and specifically my written communication using voice recognition software.

I am excited by the potential for breakthrough learning and the opportunity to share this with my colleagues for significant benefits for priority learners and for school leaders.

## Getting Started

### *Research*

My attempts to learn from the professional literature proved futile. Although there is some research available it is dated and not relevant to my inquiry; the few papers with an educational context relate to assisted technologies where speech recognition has been used to assist children with severe learning needs.

This is an exciting new field of inquiry and there is limited research available primarily because voice recognition technology has only developed, in the last two or three years, to a point where it is accurate and reliable. A special feature in *The Economist* (January 2017) provided articles that explained how it is that the accuracy has improved so significantly. References that I have found useful are included in the bibliography.

### *Contacts*

Having found little of use in the literature, I turned to the experts in New Zealand and overseas who could put me on to people who were leading the way with this technology in schools. I levered personal contacts at Auckland University and the University of Waikato and contacted people such as Michael Fullan, Andy Hargreaves, Mark Treadwell and Dylan Wiliam directly. The responses affirmed the worth of the inquiry and failed to identify anyone working on this area of research.

“You are definitely onto something though.” Andy Hargreaves email.

### *Group Trial*

At my own school, I asked teachers to identify children who were capable speakers but reluctant writers. A marked difference in the PAT testing (when a child has a high listening comprehension score and a low reading comprehension score) was an indicator but more importantly, it was the teacher’s observation and knowledge of the child. I set up a Google classroom for this group of year five and six students and we met weekly to explore the possibilities of voice typing. Google voice typing is available free. I explored Dragon Naturally Speaking, the other option, but deemed the cost of both the software and the need for a laptop with significant processing power, to be a sufficient disincentive. (Although currently I see it as the best option for educators for their own use)

I began to trial voice typing as a tool for my own writing and compared it with Dragon Naturally Speaking which I have used for several years.

## Underway

### *Contacts and Visits*

I stepped up my efforts to find contacts in the United Kingdom and Europe by joining all the Google Education groups in Great Britain and Ireland as well as in Europe (although I found that English was not the language of preference for all of them!). For each group I summarised my inquiry and asked anyone who was interested to make contact. I also emailed directly the Google schools that I could locate and the accredited Google advisors. From scores of attempts at connection, I drew a blank. Direct approaches to various universities in England also failed.

Professor Ian McLoughlin, head of computer science at the University of Kent, was a beacon in the fog. He was keen to compare notes and generous with his time. Ian's passion for automatic speech recognition is infectious and his knowledge of this field is extensive borne of academic study and practical solutions-based work in business. One of his areas of expertise is developing speech recognition in Mandarin. I visited him on campus and the discussion was thought-provoking and intriguing. He provided information about the technology itself and how meta data have transformed the software's accuracy with speech variability, such as regional accents. Although he had no knowledge of voice recognition software being used with reluctant writers he was excited by the possibility and took this idea to the International Speech Communications Conference in Stockholm (August 2017).

*It was great to meet you and discuss these things, which have got me thinking quite a lot since, and I also discussed them with a few other academic visitors in Stockholm. They didn't have anything 'mission ready' but I wouldn't be surprised if your ideas, questions and interests prompt some new technology in this area, probably within the next couple of years. So, if you see some new speech technology for dyslexia or reluctant writers and readers coming out of a university lab, you'll know that it probably came from your impetus!*

*Best Regards, Ian*

I also travelled to Birmingham to visit one of Ian's colleagues but unfortunately, was unable to see him.

### *Group Trial*

The reluctant writers' group response to voice typing was immediate and positive. They enjoyed experimenting with voice typing on a Chrome browser using Chromebooks. Members expressed delight that writing could be so easy. They soon discovered in a classroom environment, with several people talking, that accuracy would be improved by the use headsets. I used Equico grant funding to buy headsets for the target group and later for other classes.



There was great excitement opening the headsets and trying them out.

Early speed tests indicated that when using voice typing children could write between 15 and 50 times faster than when they typed in the usual manner. Several children noted that voice typing worked better when they spoke clearly. The need to improve their spoken language was a welcome extra benefit.

The students using voice typing were keen to spread the word. They could see that other students could benefit so they created a short video presentation showing how to access voice typing and visited classes to provide live demonstrations and encourage students and teachers to give it a go. They also explained that voice typing worked better with the use of the headset if the environment was noisy.

I purchased a wireless headset for my own use and have tried both Google voice typing and Dragon NaturallySpeaking.

- [Google Voice Typing](#) is a cloud-based application which accesses metadata to identify your speech profile and then, providing you speak clearly, transfers speech to text with remarkable accuracy. This is less successful for people with unusual accents or speech difficulties. You can speak the punctuation eg add commas, full stops and paragraphs. Although it is free and the best option for classrooms, its chief limitation is that it is only available within Google docs and slides but has yet to be included in Gmail or web-based applications. This will undoubtedly be in the pipeline and until then can be provided via a Chrome extension for Gmail (see Getting Started Resources). You can voice type into a Google Doc and then copy and paste any

selection of text into any other document or email or blog. Google voice typing can also be used on an iPad, tablet or mobile phone.

- [Dragon Naturally Speaking](#) works most effectively in Microsoft products including Word and Outlook. It works for the Google Suite including Gmail. It learns your speech and it continues to build your vocabulary and learn your idiosyncratic delivery as you use it. I use this tool for all writing tasks. I receive a lot of email. I am no touch typist so dictating email saves me time. For any writing such as feedback to teachers or updates on the school website, I use Dragon. The process that works best for me is to dictate (using basic punctuation commands) and then to review and edit using the keyboard. The only problem I have found is completing some online application forms where the text appears as you speak it but then does not save. This is a minor inconvenience. It will not work on a Chromebook or an iPad because it needs a more powerful processor and more RAM. The current version (PC v15, Mac v6) can be downloaded for US\$300 from [Nuance](#). This requires a laptop or desktop with processing power to enable it to work. You will also want a headset. I bought Dragon Naturally Speaking Professional Individual version 13 from PB Tech and they, at that time stocked an education version for \$99. It provided a wired headset in the box. I now use a Bluetooth headset which cost \$150 and this allows me to be able to walk and talk; I am not tied to my desk and I find that it improves thinking, being able to move. It also reduces fatigue.

## Lessons Learned

At various times during the last decade I have committed significant time to trialling voice recognition software. This has been a frustrating process. Time and time again the technology has disappointed, with its lack of reliability and accuracy. This is real issue, for those who speak with a strong accent. Take a moment to see this point demonstrated in this humorous [elevator speech recognition skit](#).

However, the technology has improved! The current model is much more accurate, and I am now successfully using this writing tool (dictating this report). It has quite simply revolutionised my writing. No longer do my poor 'hunt and peck' typing skills limit my output. It is this change that has led me to consider the implications for the classroom, as well as for my educator colleagues.

Voice recognition software is reliable enough, I believe, to add real benefit in the school context. It has the potential to make significant improvements in these situations:

1. Where **priority learners are faced with barriers to writing** – typically involving poor fine motor skills, spelling and generally committing 'thoughts to paper';
2. Where **priority learners have learning disabilities** – e.g. dyslexia/dyspraxia;
3. Where **priority learners have physical disabilities** that prevent or inhibit writing;

4. Where **ESOL students** can benefit from the software's ability to read back text;
5. Where **reluctant writers, often boys**, are academically capable but lacking in motivation to write or type, can produce written language which reflects their capabilities;
6. Where **teachers and principals** are required to produce significant quantities of writing and lack the typing skills to effectively achieve this output; and
7. Where **teachers** who have poor typing skills can provide quality written feedback to students within much tighter timeframes.

As stated previously, my interest is reluctant writers. The target group was a group of children who had been identified as competent speakers and reluctant writers. Having had access to voice typing for the better part of two school terms, each member of the group would tell you that voice typing can make a significant difference. It liberates the writer from the mechanics of writing so that he or she can concentrate on the ideas. It allows the writer to get down the ideas very much more quickly than would be the case with pen or keyboard. The children can spend their energy on editing and this task, most found, was the easiest with the keyboard.

In their own words...



[Voice typing catches your first ideas for a better story](#)



[Cameron talks about how voice typing has improved his writing](#)

After a just few weeks, the target group developed a missionary zeal for voice typing. They were keen to tell other children so that they too might be able to use this tool. To that end, they presented to each of the classes at the year three and four levels of our school (7-8-year olds) They provided a demonstration on a large screen followed by everyone having a go on Chromebooks (some borrowed from other classes to achieve 1:1 for this session). The student experts provided small group tuition. One student used Screencastify to record a very quick message to show children how to get started.

### [30 second video: how to get started with Voice Typing](#)

The group was pleased that their enthusiasm was infectious. Even with the use of headsets it was evident however, that as the noise level in the classroom increased, the voice typing accuracy diminished.

One member of the group, Sammy did his own experimentation and describes the results.



### [Using voice typing in the classroom.](#)

In a noisy classroom environment, the microphone on the headset struggles to differentiate the voice of the writer from the surrounding voices. In a quiet classroom, children have experienced success although it makes the writing process quite public if other students are quiet. In a busy classroom I have seen a child with a headset, under a table and distanced from other voices, voice typing with success. The technology is at its best when individuals or small groups can find a quiet space in a breakout room or perhaps just outside the classroom.

A teacher of a Year 5-6 classroom encouraged children who were keen to use Google voice typing and asked them to summarise their learning using a Positive/Minus/Interesting chart.

### [Room 3 Voice Typing PMI](#)

Interestingly, these children see it as a negative in that they need to speak clearly. My guess is that the teachers and parents would view this quite differently!

Good quality headsets are available at about \$40 each and because you can't have everybody voice typing at once, it is a cost-effective solution to provide five or six per classroom, at least to begin with. I bought the [Logitech H151](#) model which proved to be able to stand the rigors of the school environment. I suggest that confident children who have used voice typing introduce it to other students using the 'Getting Started Resources' in this report. Google voice typing is web-based so it will work on any device providing you are using the chrome browser and providing the device has a microphone or jack for the headset connection. So, you do not necessarily have to have a headset, but without one a child will need a quiet space for dictation.

I recommend that principals find ways to make voice typing available to students and encourage them to try it both at school and at home. Communication directly to teachers, students and parents is recommended as is the purchase of headsets for children to experience greater accuracy in noisier environments.

Voice recognition has already made a profound difference to my practice. I am more productive, managing the daily influx of email more effectively and providing better quality written feedback.

For principals and teachers who wish to improve productivity, I recommend the purchase of Dragon NaturallySpeaking, education version.

F.Y.I: Nuance claims Dragon Naturally Speaking delivers the following...

- Work faster and more accurately. Create documents, reports, make Facebook and Twitter posts, e-mail, and surf the internet 3x faster than typing – with up to 99.9% accuracy.
- Using Dragon will dramatically reduce strain on your eyes, wrists, hands, neck, back, and entire body. Work in a relaxed hands-free mode without developing repetitive strain injuries
- Be more creative and a better note taker. Dragon keeps up with your thoughts at the speed of your voice. How many times have you had a great idea and you couldn't write it down or type it fast enough to remember everything in detail as it entered your mind? Just speak and Dragon does all the typing for you.

Although the alternative is a little more cumbersome, voice typing can be used in any Google Doc and when appropriate, simply cut and pasted to email or word or anywhere else. For Gmail users there is a Chrome extension, already mentioned, that allows dictation to email.



## **Finally**

Voice recognition technology has changed exponentially, and it is improving the more we use it. Voice typing is fast becoming ubiquitous. Many people use it on smart phones and this will likely be the case for those of us who want to make writing easy in any digital space. Reluctant writers can find this free tool a game changer. We can if we wish to, stop typing and just say it.

## **Getting Started Resources**

1. [Getting started with Google Voice Typing](#) ( I show you the basics!)
2. [Google voice typing including punctuation.](#)
3. [Using Google's Voice Recognition to Voice to Text for Gmails and Google Documents](#)

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