goQ software: It's all in the Q

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In the Q

Esteem
Acceptance
Confidence
Achievement
Belonging
Worthiness
Happiness
Success

These are not words that students often associate with writing. They are intangible, not something to be touched, tasted or marked like spelling and grammar. However, they are some of the true benefits and rewards for being able to communicate effectively through writing.

Before proceeding any further, we wish to be clear that we have no intention of producing a product that automatically fixes someone's writing or writes for them. Students must still do their own work. They have the final say. Our intention is to assist students such that written content truly reflects their own thoughts and what they know.

Many believers of Artificial Intelligence might think that future technology will write entirely for us like cars will drive themselves. We believe that it is only writing under an individual's control that leads to the rewards mentioned above.

Are goQ software AT?

We are often asked, "Are your products (WordQ, SpeakQ, iWordQ, ThoughtQ) special needs or AT?" Certainly, many perceive our products as just compensatory tools for writing.

Several years ago, one of the authors, then a teacher, first saw the power of what WordQ could do for his IEP students. An "aha" moment came when he gave WordQ to everyone in his class, and he saw how *everyone* benefitted. It was his first glimpse into how our software was beneficial for all students, and not just in the world of AT.

Evidence has shown that almost all students struggle with writing, composing, editing or both. Left unaddressed, the struggle continues into adulthood. Now let's consider a typical school population. Special education consists of approx. 13-15% of a school district population. Usually 35% of those students have multiple disabilities. Most students who fit into this smaller population may require other multi-layered supports beyond a tool that supports writing. We understand and agree wholeheartedly.

The other 85-87% percent of the student population generally doesn't need multi-layered software, or all-in-one solutions to aid in their learning, but they can still benefit from focused tools that may be derived from AT. Depending upon the specific locale, a large percentage may include second language learners. Realistically and unfortunately, this large group of students, and often the parents and teachers as well, reject using "special needs" software if described as such.

Now consider a ubiquitous life-long tool such as glasses. Glasses do not read for us; they enable our brains to perceive, interpret and react to the world around us. It is in the same sense that we develop goQ software – as general tools to help individuals focus on what they see or hear as words, phrases, or sentences, such that these can be better understood, interpreted and then expressed for others to appreciate.

To answer the question above, while our beginnings related to accessibility, goQ products are **universal literacy tools for all students**, while being inclusive of AT needs. The end goal is to help individuals achieve what is in the Q.

Effective usage

Arguing over which product has the best word prediction, the best voice, or the most features is quite meaningless because it comes down to effective usage. A salesman can always highlight how their product appears to work

better than a competitor in certain situations, but what does that really tell us? Walking in the shoes of a struggling writer, we also see little value in feature lists because they give no indication whether a feature is effective and usable. All products comparable to goQ software include state-of-the art technologies yet none can read your mind or write for you. Like a pair of glasses, one cannot see the benefit (or the lack thereof, in the case of a wrong prescription) until one wears them to see – a product provides benefit *only if regularly and effectively used*.

The goQ approach is to encourage regular and effective use by focusing on **simple-to-use** interface design associated with a small set of key technologies aligned with **functional strategies**.

goQ software

goQ software are available on a variety of platforms – PC, Mac, iPad and Chrome. Each platform has its constraints that limit what the software can do but also offers opportunities for doing things differently. The following briefly describes each software.

WordQ for PC and Mac desktops is our original product designed to work with whatever application used to write. It provides writing/reading support with word prediction and speech feedback. Some applications do constrain WordQ by blocking this type of technology.

SpeakQ is an add-on to WordQ for PC desktops providing speech recognition for one purpose only – voice typing. It was designed for persons who cannot directly articulate in well-composed phrases and sentences such as doctors and lawyers.

iWordQ App for the iPad shares the same word prediction and text-to-speech technologies as WordQ for desktops. Restrictions within iOS led us to develop iWordQ with its own simple writing space but without constraints by other applications. We took this opportunity to add a novel reading space.

WordQ for Chrome is similar to iWordQ with its own simple writing space and embedded word prediction, speech feedback and speech recognition, but without a separate reading space (yet). It is designed primarily for Chromebooks in schools where hi-speed Internet is inconsistent. It enhances Google speech recognition with some SpeakQ functionality. As a Chrome Packaged App, it has the advantage of also operating on a PC or Mac.

ThoughtQ for Chrome suggests words and phrases ("thought triggers" or topic words) often not considered when searching. These words are linked to an embedded Google™ Custom Search to discover information for essays and reports with less effort and in less time, while gaining greater knowledge. Topic words can be exported/copied for use in any of the various WordQ products.

goQ strategies

Writing is one of many forms of communication. Many who struggle to write may not struggle the same way in conversation. goQ strategies are mostly designed to take advantage of a person's ability to listen and to speak, thereby bridging the gap to some reading and writing proficiency. We emphasize the importance of getting one's ideas down prior to fussing over spelling, grammar and even the flow of ideas. After all, one needs some raw material to begin. (You need *something*, and *not nothing*, to bake a cake.) With some content on paper, even imperfect, it can be improved over time via our proofreading strategy.

Word prediction

An early writer may suffer from the fear of the blank page the same way as seasoned writers. An early writer may have additional issues such as spelling. Regardless, word prediction allows one to quickly put words on screen. One may begin typing any letter to see suggested words and randomly select a word. Because we analyze lots of real human data, the prediction is semi-contextual and semi-grammatical. By continually alternating between typing and selecting predictions, a student can quickly write something. *A friend who has been on a regular price is not only one of my favourite colour.* A parent or a teacher can step in, "Come again? Who is this friend?" The kid bursts into laughter. Over the years, we have observed many kids getting over their fear of writing when they see they can write. Even if it's something that makes little sense, it is workable raw material.

Speech feedback

Speech feedback lets you listen to the words on screen, so that you can determine if they make sense. It is available across goQ software. In WordQ, speech feedback comes in several flavors, at the letter, word, phrase, or sentence level. Emergent writers may also listen to each letter typed. For others, hearing the words is sufficient to learn the visual and auditory shape of each word, especially when reviewing suggested words. Advanced writ-

ers may want to listen for the flow of phrases or sentences, which leads to our proofreading strategy.

Proofreading is an onerous task even for experienced writers. Many don't proofread at all or do a haphazard job at it. The difficulty lies in the load imposed by reading for content and simultaneously for mistakes. WordQ delegates the visual load of proofreading to listening as follows: focus on a sentence; hear the whole sentence spoken out loud – do words, their order, and flow make sense; manually step through the sentence word-by-word to identify specific mistakes; edit if necessary; listen to the sentence again; repeat; and then focus attention on the whole sentence again to be satisfied before moving on. The same strategy is used/taught by many for writing without any technology or editorial support.

iWordQ reading space

The reading space in iWordQ is designed to complement proofreading. Besides proofreading, one may also read for content and for pleasure. How text is displayed on screen becomes important, especially for those learning to read, or those who are burdened by too much information. Text is displayed with typographical enhancements designed to improve readability. A novel option automatically highlights text in manageable phrases to enhance comprehension. Highlighting with speech feedback on the iPad's touch surface helps one engage with the text. When speech is turned off, the automatic highlighting can be used as a teleprompter, for learning to read aloud or for practicing a speech.

Speech recognition

SpeakQ's speech training module incorporates a key strategy. It presents a short sentence fragment and speaks it out loud while highlighting each word. You then repeat speaking after it. When you speak, each recognized word is transcribed and spoken below. Thus, the speech trainer also functions as a conversational partner, where the connection between speech and text is reinforced twice. This benefits second language learners as well as those who have difficulty speaking or who speak in "street language."

In addition to conventional inline voice typing, SpeakQ offers a speak-and-select mode where recognized words are shown in the word prediction list to be reviewed with speech feedback. This is ideal for new users or those with poor speech by reinforcing slower and more clearly articulated speech. This is also a stop-and-go strategy allowing quick edits in between utterances to help lessen the burden of correcting undesired text being entered. In both modes the recognition is spoken when entered, so that the user knows what has been recognized. Immediate corrective action can be taken if necessary. Recognizing that even expert users rarely edit by speech, SpeakQ has no speech editing commands. In fact, there are no speech commands at all.

Topic words

We began with *writing* words in word prediction and now we have come full circle; ThoughtQ is designed to pull out words and phrases from *reading* material. In the old days, students were sent to the library in search of raw material for their assignments. Students learn skimming strategies, thereby pulling out key concepts from text, for example, "acid rain" and "fossil fuel" from an article on pollution. It may not be realistic to expect the same of students nowadays. However, that is not to say reading strategies are no longer important.

Similar to WordQ, ThoughtQ presents a list of suggestions when the user enters a query. The suggestions are topical words and phrases "outside-of-the-language-box" for students, allowing them to move beyond basic topical words for their search. It is much like a skimming process for a proficient reader. The difference is a student often lacks the actual reading/skimming skills. These topical words become pointers for opening up new varieties of reading material via Google search, which is a departure from the kneejerk behavior of stopping at the first article encountered.

More proficient writers can also benefit from ThoughtQ. Some topic words can be used for brainstorming, or better, as dots waiting to be connected. And connecting the dots is what we offer, not just for the user. When ideas are better communicated, people are better connected, and better results can be achieved.