See the Big Picture

The relationship between visual impairments and student performance

By Sheri Ainslie

Have you ever worked on a puzzle only to find that a piece was missing as you neared completion? If you have, you will know that feeling of dissatisfaction the semi-complete picture can evoke because it doesn’t live up to the promise of the picture on the box, despite your efforts.

That is how I am feeling about students who are failing to meet the provincial standard for EQAO, or those who can meet the standard only with accommodations, such as text to speech software. What if we’re missing a crucial piece of their puzzle? The research and learning upon which I have focused recent professional inquiry suggests there is.

This missing piece is actually a collection of related pieces called Vision Skills, and they have been called the ‘hidden learning disability’ for their knack for going unrecognized, misunderstood and unaddressed, to the detriment of learners. Do not confuse Vision Skills with visual acuity, which is what most of us think of when we consider vision. In fact, visual acuity is just one of the following Vision Skills the American Optometric Association identifies as essential for learning:

- **Visual acuity** – the ability to see clearly in the distance for viewing the chalkboard, at an intermediate distance for the computer and up close for reading a book.
- **Eye focusing** – the ability to quickly and accurately maintain clear vision as the distance from objects change, such as when looking from the chalkboard to a paper on the desk.
- **Eye tracking** – the ability to keep the eyes on target when looking from one object to another, or moving the eyes along a printed page.
- **Eye teaming** – the ability to coordinate and use both eyes together when moving the eyes along a printed page.
- **Eye-hand coordination** – the ability to use visual information to monitor and direct the hands.
- **Visual perception** – the ability to organize images on a printed page into letters, words and ideas and to understand and remember what is read.

You can see how each of the above skills would be necessary for reading and other learning tasks. Yet all but visual acuity are virtually unknown despite the fact that 75–90 percent of learning in a classroom is visual, and estimates indicate 25 percent of children have a vision problem significant enough to affect their school performance (according to
VisionandLearning.org, a website maintained by the College of Optometrists in Vision Development Award of Excellence winner Dr. Mary McMains).

In a ground breaking paper published in 2003, W.C. Maples assessed the Vision Skills of 540 students over three consecutive school years and compared these results with their demographic and achievement data. He found that Vision Skills were a significantly better predictor of academic success than both socio-economics and race (Maples, 2003). The Ontario Ministry of Education document Learning For All refers to achievement gaps related to socio-economic status, and many initiatives have sought to boost the performance of students growing up in adversity. If Vision Skills are a significantly better predictor of learning success than socio-economic status, why is it so little known about in education circles?

In addition to being overshadowed, another reason the Vision Skills piece is so often missing is that it can be misunderstood. This is not surprising, considering the clinical symptoms of poor Vision Skills significantly overlap with the diagnostic criteria for ADHD (five of the nine DSM symptoms are identical). In fact, one study found a three per cent incidence of Convergence Insufficiency (a common eye-teaming problem) in the general population and 15.9 per cent in the ADHD population (Granet et al, 2005). Why are poor Vision Skills more common in the ADHD population? Could it be, at least in part, because the symptoms are so similar?

Another study found that even very low levels of blur or near strain were enough to trigger symptoms suggestive of ADHD on the Conners Continuous Performance Test (Poltavski et al, 2012). When a child with Vision Skills deficits is reading or doing nearwork, the words may appear to come in and out of focus, jump or float around; they may keep losing their place; they may get a burning sensation in their eyes; or they may feel mentally exhausted and frustrated after working for only short periods of time. These symptoms would make it hard for anyone to sustain attention, let alone a beginning reader.

With some fascinating research involving Ontario students in 2012, Dr. Patrick Quaid (www.gvct.ca), found that students who are on IEPs for Reading were eight times more likely to have Vision Skills versus students who don’t have IEPs. In another study out of New York State, researchers Johnson and Zaba found that 68 per cent of the young offenders tested failed one or more developmental eye movement test(s). They observed that, “It is difficult for a treatment program, particularly an academic one, to be effective if the adolescent lacks adequate visual skills” (Johnson & Zaba, 1999).

Enter the missing puzzle piece. If it is difficult for academic interventions to be effective on students who lack adequate visual skills, how do we determine who they are early on in their education careers and intervene before they are on IEPs, regarded as inattentive, and failing to meet provincial standards?

Teachers Louise McCulloch and Judy Richards teamed up with Dr. Barbara Patterson in Saskatoon to answer this question in 2006. In their study entitled The Efficacy of Vision Therapy in the Kindergarten Setting, they hypothesized that school might be the best place to screen and provide consistent remediation for children with visual efficiency problems.

They observed that there are many school-based screening and intervention programs in place to support struggling learners: speech/language, fine motor, cognitive, etc.

Yet there was no comprehensive screening and intervention process for Vision Skills. The authors acknowledged that reading is a complex process, and there is no one silver bullet to ‘fix’ learning problems. However, the results of their study led them to conclude that school-based vision screening and therapy “provided a missing component of the multimodal methodology required for assisting kindergarteners to be more successful in acquiring letter recognition and the scanning skills needed to acquire the reading process.”

I recently created a school-based Vision Skills screening process for my Principal’s Qualification Program Practicum.
and implemented the process as a leadership learning inquiry. The results were promising and compelling, with strategies that can be applied to support learners in any school. What follows are steps I took to initiate Vision Skills screening at our school.

BUILD AN AWARENESS AMONG STAFF

The first step towards supporting students experiencing weak Vision Skills is to deepen staff understanding of vision and learning, beyond visual acuity. With the many different reading assessments used by teachers to determine student need and improve achievement, teachers are well positioned to observe hallmarks of poor Vision Skills. But they have to know what they are looking for, as some symptoms are easier to connect to vision than others. Rubbing eyes, excessive blinking, squinting or holding the book too close are some of the easier ones. Many others are not naturally associated with vision, such as: does not listen when spoken to directly, talks excessively, gives up easily, avoids tasks, blurts out answers and takes an inordinate amount of time to complete work.

The College of Optometrists on Vision Development (COVD) has published a list of symptoms of learning-related vision problems on their website at COVD.org. All educators should be aware of the look-fors on this list and watch for them in students who are struggling.

After an information session on Vision Skills, teachers at our school tracked the signs and symptoms from the COVD’s list during their benchmark assessments for reading. They observed students who were displaying hallmark behaviours and referred them for screening.

SCHOOL-BASED SCREENING

With parent permission, referred students participated in a Vision Skills screening process that consisted of a symptoms survey (Convergence Insufficiency Symptom Survey – CISS) and computer based visual tasks (Binocular Vision Assessment – BVA). Both provide instant pass/fail reports.

While the BVA software can only be ordered by a vision professional and operated with appropriate training, the CISS is free (gvrc.ca) and can be administered by anyone: simply read the 15 questions exactly as they appear on the page and score the responses according to the instructions. The questions probe how frequently the individual experiences symptoms associated with weak Vision Skills. The CISS has been validated through peer-reviewed research with children as young as 9. A score of 16 or higher is suggestive of a Vision Skills issue.

In Dr. Quaid’s aforementioned research, he found CISS scores to be a strong predictor of which students would be on IEPs. In my inquiry, 56 per cent of the students screened failed the CISS. One student in particular presented with a symptom score of 41, was referred to an Optometrist, and after 5 months with new corrective lenses and home-based exercises, she scored 17 when the CISS was re-administered. It is only logical to predict that her achievement will improve with her visual burden lessened.

CONNECT WITH LOCAL PROFESSIONALS

The COVD, among other services, offers board certification for eye doctors who specialize in Vision Skills for childhood development (look for initials FCVD after the doctor’s name). Its website has a search engine identifying doctors geographically close by. You might consider asking these doctors to be part of staff professional development, present at Parent Involvement Conferences or receive referrals for students whose CISS scores warrant further investigation. (It should be noted that screening does not replace routine professional care.)

Furthermore, would anyone argue the contribution an Optometrist could make as part of any school board’s Multi-Disciplinary team? Adequately functioning Vision Skills should be ruled out before more costly testing such as Speech Language or psycho-educational assessments are considered, and certainly before medicating a child for ADD/ADHD.

PARTNERSHIPS FOR INTERVENTION

One might suggest that Vision Skills are the realm of health-related ministries and associations, not the business of Education. To that I would respond that schools are best for identifying students who are struggling academically and demonstrating hallmarks of Vision Skills issues in their daily work, while vision care professionals are best for testing, diagnosing and prescribing treatment for Vision Skills dysfunction.

Of the students who failed the screening at our school, 43 per cent reported back that they had followed up with a doctor and that a Vision Skills deficiency had been diagnosed.
Researchers found that 80 per cent of the identified students met the criteria for ‘inadequate’ or ‘weak’ visual skills in one or more areas.

These diagnoses were related to reduced near vision (the kind needed for seatwork and reading), weak eye movement control (the kind needed to track text across a page) and poor ability to adjust focus (which is needed whenever we change our gaze).

So how do we work together to fill in the missing piece and support students whose Vision Skills are holding them back from living up to the picture of their potential?

An innovative pilot project between the Ontario Association of Optometrists (AOAO), The Hospital for Sick Children (SickKids) and McMaster University is on the right track. Their project provides vision screenings for kindergarten students in 10 Ontario elementary schools. Following the school-based screening, students who were identified with a vision problem were referred to an optometrist, who conducted an eye health examination on-site.

At Paisley Road Public School, the project unearthed vision skills issues in more than one third of the children screened, and ensured timely follow-up services. In cases where glasses were prescribed, they were provided free of charge through OAO’s Eye See…Eye Learn® program, which provides a complimentary pair of glasses to junior kindergarten students with their eye exam.

One study of 144 beginning readers published by the Journal of Optometric Vision Development concluded that, “visual factors were a primary cause for beginning reading failure in children” (Young et al, 1994). Another study out of California in 2007 assessed 461 adolescents who were identified by their high schools as poor readers. Researchers found that 80 per cent of the identified students met the criteria for ‘inadequate’ or ‘weak’ visual skills in one or more areas (Grisham et al, 2007).

What if early screening and intervention processes like the one mentioned above were in place for these students? Would they still be struggling in high school?

A final reason the Vision Skills piece is so often missing is that although ‘routine’ eye exams are covered annually for children, comprehensive Vision Skills assessments and vision therapy services are not considered routine, and therefore not OHIP insured. Unfortunately, there are fewer things more routinely needed by a reader (especially a beginning one) than eye teaming, eye focusing and eye tracking. Establishing processes that ensure students have adequately functioning Vision Skills is an action education and health leaders are morally obligated to take to support equity and well-being for students.

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REFERENCES


