



Perceptions of Elementary Teachers about Vision and Learning and Vision Therapy

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Abstract

An online survey was distributed throughout Michigan to examine the perceptions of teachers concerning the connection between vision problem detection, academic achievement and vision therapy intervention. One hundred fifty four elementary teachers representing 22 counties throughout Michigan participated in the anonymous online survey. All of the Michigan elementary teachers who responded stated an awareness of the connection between vision and academic achievement and 86% had recommended at least one child for a comprehensive vision examination. Squinting was the most common reason for this recommendation. Of the participants 81.9% reported witnessing improvement in students who had undergone vision therapy; 94.9% stated that their schools had a vision screening program in place while 35.1% were unsatisfied with the current system; and 93.4% agreed that mandatory eye examinations prior to kindergarten would benefit both the students and the school. Most participants (86%) believed that the state or federal government should enact a mandatory comprehensive eye examination program.

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Key Words

classroom symptoms of visual problems, comprehensive vision examination, elementary school teachers, referral for vision examination, survey, vision screening, vision therapy

INTRODUCTION

It is estimated that one in five children in America today has a vision problem.¹ Given this high prevalence, it is very important to diagnose these problems before they interfere with a child's learning potential. In general, learning difficulties are grouped into five categories: math difficulties or dyscalculia, language difficulties or dyslexia, motor skills difficulties or dyspraxia, writing difficulties or dysgraphia, and behavior disorders.² Visual difficulties may be a primary or contributory factor in each of these categories. Learning related vision problems can be further broken down into two broad components, namely visual efficiency and visual information processing. Visual efficiency represents the basic components of visual function relating to refractive error, accommodation, vergence, and ocular motility. Visual information processing involves higher brain functions integrated with motor, auditory, language and attention systems.³ Although vision can play a role in learning difficulties, it is estimated that 2.25 million children have a learning disorder not related to vision as the primary cause.⁴ If this estimate is true, there is a need to distinguish those learning disabled children who have a visual difficulty from those who do not.

Children with undetected and uncorrected vision problems might never reach their full academic potential.^{1,5} Further, children with visual difficulties are at a greater risk of dropping out of school, and becoming

juvenile delinquents.⁶ Therefore, it is important to detect and treat these problems as early as possible. There is no better place to detect vision problems than in the school environment where the visual skills are put to the test every day, since an estimated 80% of what a child learns enters through the visual channel.^{6,7}

It is the teachers who are positioned to observe children during the most demanding visual tasks of their day and to secure firsthand information of potential signs of vision issues. This is especially true for elementary school teachers who are exposed to younger children, and are with the same students the majority of the day. Some schools have vision screenings available to help detect potential visual problems. These screenings typically include tests that detect amblyogenic factors, such as, anisometropia, strabismus, significant hyperopia or myopia, media opacities, astigmatism and ptosis.⁵ Very little research has been conducted concerning the referral habits and basic knowledge of vision related learning issues among elementary teachers. An online survey was produced and distributed in Michigan to assess these and related areas.

METHODS

Subjects, Materials and Procedures

The survey contained general questions pertinent to elementary teachers' knowledge of vision and learning with four sections titled: background information, vision examination referrals, vision and learning, and school screenings. The survey was posted to the internet using the site www.StellarSurvey.com.⁸ The head secretaries, principals or superintendents of 370 randomly selected elementary schools throughout the state of Michigan

were contacted by phone or e-mail over the course of two months. We sent by e-mail the cover letter (Appendix A) with an e-mail link to the survey (Appendix B) to administrators or administrative professionals requesting permission to survey their teachers. Those who accepted distributed the information to the elementary grade school teachers within their school or district.

The survey was designed to reach approximately 2400 teachers within the 370 elementary schools. A goal of a 10% response rate was set, and 240 teachers were expected to respond to the survey. Because we do not know how many of the administrators actually forwarded the survey, we cannot accurately calculate the actual response to the survey. The online survey was closed to responses approximately two months after the last school e-mail was sent for teacher distribution. The results of the surveys were tabulated and analyzed in the following report.

RESULTS

Background Information

Out of 2,990 elementary schools located in the state of Michigan, approximately 370 in 83 counties were surveyed. This represents about 12.4% of elementary schools in the state or an average of four elementary schools per county. Responses were received from 154 individual teachers in 22 counties but, representing only 6% of the projected 2400 teachers. This sample did however represent a wide variety of grade levels taught including: 9% kindergarten, 15% 1st grade, 14% 2nd grade, 13% 3rd grade, 13% 4th grade, 7% 5th grade, 1% 6th grade. Fully 31% of those responding taught multiple classes/grades. Eleven percent of the teachers responding had taught from one to five years, 20.8% had taught between five to 10 years, 21.4% between ten to fifteen years, and 46.8%, taught between for 15 years or more. The mode for class size of those surveyed was from 20 to 30 students while the mode of students per class wearing a vision correction was 3 to 5 per class.

Vision Examination Referrals

The next section of the survey found that 137 teachers responded to the question: "Have you ever recommended a student (past or present) to receive a comprehensive vision exam?" Almost 14% responded "No" while 70% responded "Yes," to one referral and 16% responded "multiple times." Thus, a total of 86.2% of respondents had recommended vision exami-

Table 1. Most Common Signs or Observations of Visual Problems Noted by Teachers

Signs	% of Responses
Squinting	69%
Working distance	47%
Can't see board/moving closer	46%
Reading skills/ low level	33%
Headaches	25%
Handwriting/copying problems	21%
Tracking	14%
Rubbing/watering/ eye health	13%
Reversals	11%
Eye turn	6%
Attention / following directions	6%

nations for one or more children. When asked why they recommended that these students receive a comprehensive vision exam: 54% noted class observation of behavior, 22% poor academic performance, 12% physical observation of the child, 5% something the teacher observed during playtime or on the playground and 7% respondents indicated "other." The teachers responding as "other" provided specific examples for this recommendation. The follow-up question inquired whether the students' parents followed through with the recommendation: 21.9% of the teachers answered "Yes," 59.9% answered "Yes, but only some of the time," 7.3% answered "No," and 10.9% checked the "comment" box and gave answers that were related to the financial inability of the parents to follow through with the vision examination. This category was interpreted as "No" responses.

Teachers were asked what signs or observations they identified as related to students having a vision problem. Eight out of the 137 answered that they were unaware of what to look for. The other 129 teachers provided answers that ranged from holding reading material too close to not being able to see the board. (Table 1) On average, each teacher listed 3.4 possible signs they had observed before making a recommendation for a vision examination. The most common sign listed was squinting, cited by 69% of respondents.

Vision and Learning

Teachers were asked if they had any students in their class who had received any form of vision therapy. Thirty seven percent responded "Yes," 20% responded "No," 32% were "unaware," and 11% responded by checking "What is vision

therapy?" Those who responded "Yes" to the question were asked if they noticed a difference in the student's overall achievement in school after the vision therapy. Eleven out of 61 (18%) of respondents noticed a dramatic change, 39/61 (63.9%) noted some improvement, and another 11/61 (18%) noticed little or no improvement.

All responding teachers answered "Yes" to the question, "Are you aware that a student's vision can affect their academic achievement?" The teachers were then asked if they would like to receive continuing education courses related to students' vision and learning. 23.4% replied "Yes, I am very interested," 51.1% responded "Maybe, in small doses," and the other 25.5% responded "No, thanks."

School Screening

Finally, the last four questions were related to schools' vision screening programs. 94.9% of the teachers responded that their school had a vision screening program currently in place, but only 64.9% were satisfied with the screening. An overwhelming 93.4% of teachers surveyed believed that mandatory vision examinations prior to kindergarten would benefit the students and schools, and 86% agreed that the state or federal government should enact a mandatory comprehensive vision examinations program prior to kindergarten.

DISCUSSION

Background Information

While the number of survey responses was fewer than expected, (154 responded as opposed to a goal of 240) a sizeable amount of data was gathered from a diverse group of educators across the state of Michigan. Teachers responded from 22 of the 83 counties. This is a large spread

considering the relatively small number of respondents. Based on our random selection of schools in each county, the teachers likely represent a wide array of communities and differing socio-economic conditions of students. The majority of the responding teachers had been teaching for more than 10 years, making them experienced in the observation of students in the classroom. The survey respondents also represented a wide variety of elementary grades. The "other" category represented those who taught across multiple grades in a particular subject, group of subjects or alternative/special education program. Overall, we believe that this sample fairly represents the perception and knowledge base of teachers across the state of Michigan.

Vision Examination Referrals

Over 86% percent of the teachers had recommended that a student obtain a comprehensive vision examination at least once in their teaching careers. This is a good sign for students, parents and eye care providers. The high percentage making recommendations indicates that elementary teachers are in an excellent position to observe and recognize signs of vision problems. Of the teachers recommending comprehensive vision examinations, 76% noted they referred the students based on either an observed behavior in class or lower than expected academic performance. Only 12% reported that their recommendation was based on something that was physically observed such as a red eye or a strabismus. Comprehensive vision examination recommendations were based on what the teacher believed to be appropriate signs of vision problems, reinforcing the importance of educator training concerning these and other signs of vision problems in the classroom.

Only 22% of referring teachers reported that the parents followed through on their recommendations for a vision exam every time, while approximately 60% stated that parents followed through some of the time. This data leads to the question of why follow-up does not regularly occur and how the problem could be addressed. The most common reason stated in survey responses for lack of follow-through was family financial troubles. Other factors might be family problems, logistical problems, lack of access, parental denial or lack of parental motivation. Whatever the cause, these situations are unfortunate

for all involved and an all too common circumstance.

An additional problem is the common notion by parents that the school vision screening is a complete vision examination.⁸ Lack of follow-through is especially troubling for those schools located in large cities, since it has been shown that children from poor urban areas have two times the normal rate of vision problems.¹ Improvement in this problem may be obtained by optometrists working more closely with their local school systems and teachers to encourage parental intervention. This would include the introduction of programs aimed at financially aiding the uninsured or under-privileged. Perhaps teachers' or schools' greater knowledge of where and when to send a child for a vision examination would increase the chance of better compliance, although such specificity may lead to a host of political problems.

Vision & Learning

The vision and learning questions were a revealing portion of the survey. Similar to results of a survey conducted in Oklahoma and Texas, the most common sign teachers noted in students with vision problems was squinting.⁹ Comments related to working distance and inability to see the board were the next most common responses. With an average of 3.4 signs listed per responder, a wide variety of observations were offered. An impressive example came from one teacher who wrote the following:

Unable to visually track, poor convergence, turns head to primarily use only one eye when writing or reading, reversals or writing with mirror images, eyes & head movements are not disassociated-head turns to look all the time, rubs eyes during close work, unable to finish work due to fatigue (visual) - to name a few.

Ideally, all educators surveyed would reply in such a fashion that addresses not only students' visual acuity but their eye alignment, visual-motor integration, visual-attention and eye health.¹⁰ There were some common symptoms related to learning problems listed by the College of Optometrists in Vision Development Symptom Checklist¹¹ that were missing from the responses. These missing symptoms included: poor spelling, poor reading comprehension, using finger to keep place when reading, losing place or skipping lines when reading, and low

level math skills. Although some of these may have been broadly categorized under other listed symptoms.

A less impressive statistic came to light when the teachers were asked about vision therapy. Some 43% of respondents were either unaware if any of their students had ever received vision therapy, or did not know what vision therapy was. This could be deemed unacceptable from an optometric standpoint. Vision therapy has been shown to be a highly effective treatment for many common vision disorders related to reading disabilities, even more so than tutoring alone.^{12,13} The fact that so many teachers were unaware of this treatment could be remedied through further teacher continuing education and curriculum changes in college education programs for teachers. Of the 37% of teachers who did report having a student undergo vision therapy, almost 64% reported improvements in academic achievement. This finding indicates that the results of vision therapy can go beyond improved clinical findings and positively affect academic performance.

There are proactive methods that optometrists can employ to educate teachers about the relationship between vision and learning. For example, a recent article suggested making classroom visits with individual teachers to help bridge this gap.¹⁴ Further, a study conducted in New York found that a 40 minute lecture on 'vision and its relationship to learning' led to a statistically significant increase in the teachers' ability to correctly identify students with vision problems.¹⁵ These findings, coupled with the result that nearly 75% of the teachers responding were at least somewhat interested in continuing education courses related to vision and learning, indicated that even a minimal effort by optometrists could dramatically impact the local resources for referrals and lifelong patients. This would translate into many children benefitting from optometric intervention.

School Screenings & State Requirements

Michigan state law requires that students enrolling in kindergarten must provide evidence that their vision has been tested at least once since the age of three.¹⁶ Unlike many other state mandates, this law does not dictate that it must be a comprehensive vision examination, nor does it dictate any follow up vision screening or examination if the student does not pass.

Michigan law should be re-examined and updated to reflect the trend toward mandatory comprehensive eye examinations in different states across the nation. The fact that 93.4% of the Michigan elementary teachers surveyed agreed that a mandatory comprehensive vision exam would benefit both the students and schools should not be ignored.

Almost 95% of those schools responding to the survey had a vision screening program in place. However, only 65% of teachers were satisfied with their current school screening program, reinforcing the need to reexamine state screening protocol and procedures. The survey did not ask for specific details about the school screenings, but this would be an interesting area for further research. It would be beneficial to gather educator feedback on what works in regards to their school vision screening programs. Such information could be utilized to improve existing programs statewide.

Future Direction

The primary limitation of this survey was the relatively low response rate. Survey response studies may lead to biased results because of the self-selection of participants. Those responding to the survey may have taken a particular interest in vision and learning based on the introduction in the cover letter that was e-mailed and subject matter of the survey. It could be inferred that the teachers who took the time to respond to the survey are some of the more conscientious teachers and therefore may have put more effort into detecting and referring potential vision problems.

This survey did not reach pre-school, pre-K, Head-Start or 7-12th grades. Therefore, further research is needed to ascertain the knowledge base of educators instructing these grade levels. A conventional mail-based survey may have given a better rate of return, although e-mail was preferred based on cost and speed. Difficulty was encountered when school secretaries and administrators were contacted and asked permission and aid in the dispensing the survey by e-mail. The actual number of survey e-mails received and read by elementary teachers was not ascertainable. A larger response may have been obtained by utilizing individual teacher's e-mail addresses and sending the survey directly to the teacher. A few school contacts stated that they were not allowed to dispense any e-mail or disclose teacher e-mail ad-

resses even though such e-mails are obtainable on most school websites.

Conclusion

Of those Michigan elementary educators surveyed, 100% were aware that vision affects the learning potential of students. However, the majority of teachers across the state are open to the idea of additional instruction on vision and learning. Vision therapy is an area where Michigan elementary teacher knowledge appears lacking. Educating teachers about the relationship among vision and learning and vision therapy could be accomplished through continuing education courses or additions to their college teaching degree curriculum. Optometrists could help bridge gaps in knowledge and make teachers an even more valuable source of recommendations for complete vision examinations and partners in promoting healthy vision in the elementary youth of Michigan. Finally, 86% of elementary teachers surveyed believed that the state should enact a program requiring a mandatory comprehensive vision exam prior to entry in kindergarten. This indicates that the elementary teachers who responded to our survey understand how important a healthy visual system is to academic success and could be allies in an effort to enact legislation for comprehensive vision examinations in the early years of students' academic life.

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Source

- a StellarSurvey
4481 N Ardmore Ave.
Milwaukee, WI 53211
<http://stellarsurvey.com/>.

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Appendix A.

Dear Valued Educator:

Thank you for taking the time to consider this email.

We are researchers at the Michigan College of Optometry at Ferris State University investigating eye care in Michigan's elementary student population. We firmly believe that it is the teachers who can reveal the most information about this diverse age group and are hoping for your cooperation in filling out this survey. In order to ascertain the opinion of teachers from different sizes and types of school districts around this state, we have emailed this survey to several public elementary schools in every Michigan County. If you are an administrator or support professional, please forward this email to all of the elementary teachers in your school system. To take the survey now, please click on the link here: Michigan Youth Vision Initiative Survey or keep reading on about our project details.

The goals we have for this project are as follows:

1. Ascertain the approximate number of students who are currently using corrective vision devices (i.e. glasses, contact lenses etc.) in elementary schools across the state.
2. Grow optometry's understanding of how we can help educators become more aware of the subtle signs of vision problems in children and the many ways they can be treated.
3. Find out whether screening programs are currently in place in elementary schools and the teachers' opinion of how well they are working.
4. Determine the opinion of Michigan's educators about mandatory vision screenings for all students prior to entering kindergarten.

If you are interested in helping us to achieve these goals, we sincerely ask for your help by filling out this short online survey by clicking the link below. Responses are completely anonymous and no identifying information is required. Your response to the survey indicates your willingness to participate in this research.

Michigan Youth Vision initiative Survey Link

Thanks again for your time and participation. We look forward to hearing from you.

Sincerely,

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Sarah Hinkley O.D., F.C.O.V.D.
Faculty/Responsible Project Investigator

Appendix B.

Michigan College of Optometry - Youth Vision Initiative



Michigan Public School Educator Survey

Thank you for your time in filling out this anonymous survey. We value your opinion. Voluntary agreement to participate is assumed upon completion of the survey.

1. Background Information

1. What grade do you teach? *

2. In which Michigan County to do you teach? *

3. How many years have you been teaching? *

- 1-5 years
- 5-10 years
- 10-15 years
- 15+ years

4. How many students are in your class this year?*

- 1-10 students
- 10-20 students
- 20-30 students
- 30+ students

5. How many students in your class are currently wearing vision correction? *

- 1-2 students
- 3-5 students
- 6-9 students
- 10+ students

2. Exam referrals

6. Have you ever recommended a student (past or present) receive a comprehensive eye exam? *

- Yes
- No
- Multiple times

7. In regards to question 5: What circumstances or observations best describe what caused you to refer the student?

- Something I saw the student doing in class
- His/Her academic skills
- Something observed during playtime or on the playground
- Something I noticed by just looking at the student
- Other (please specify)

8. Did the parents follow through on your recommendation for the student to receive an eye exam?

- Yes, every time
- Yes, but only some of the students
- No
- comment

9. What are some signs or observations that would clue you into a student having a vision problem? *

- I am unaware of what to look for
- I am aware of the following signs:

3. Vision and Learning

10. Have any of your past or current students received vision therapy? *

- Yes
- No
- Unknown
- What is vision therapy?

11. If you answered yes to question 8, have you noticed improvement in the student's overall achievement in school?

- Yes, a dramatic change has occurred
- Yes, he/she has improved somewhat
- No, Little or no improvement has been shown
- additional comment:

12. Are you aware that a student's vision can affect their academic achievement? *

- Yes
- No

13. Would you be interested in receiving continuing education courses in topics related to students' vision and learning?*

- Yes, I'm very interested
- Maybe, in small doses
- No, thanks

4. School Screenings

14. Does your school/school district currently have a vision screening program? *

- Yes
- No
- Not sure

15. If you answered yes to the previous question: Are you satisfied with the school's current screening program?

- Yes
- No

16. Do you believe that mandatory eye exams prior to entry into kindergarten would benefit the students and schools? *

- Yes
- No

17. Would you like to see the state or federal government enact such a program? *

- Yes
- No

We welcome all additional comments and suggestions. Thanks so much for your time!
Please contact jbeute@uic.edu if you have any questions regarding this survey.