

MICHIGAN TEACHERS' OPINIONS ON THE EFFICACY OF SCHOOL VISION
SCREENINGS

by

Katie Abata and Katie Schleef

This paper is submitted in partial fulfillment of the
requirements for the degree of

Doctor of Optometry

Ferris State University
Michigan College of Optometry

May 2013

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Has been approved

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Ferris State University
Doctor of Optometry Senior Paper
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I, Katie Abata, hereby release this paper as described above to Ferris State University with the understanding that it will be accessible to the general public. This release is required under the provisions of the Federal Privacy Act.

Date

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ABSTRACT

Background: According to the American Public Health Association, about 10% of children under the age of five have eye or vision problems. Currently in the State of Michigan, vision screenings are held prior to entering kindergarten and in grades 1, 3, 5, 7, and 9 and again as part of drivers training. However, according to the Michigan Optometric Association, a vision screening can miss up to 60% of children with vision problems. This study collects and analyzes Michigan teachers' opinions about school vision screenings and the visual learning process.

Methods: Surveys were sent via email to 500 elementary teachers from randomly selected elementary schools throughout the state of Michigan. The survey asked about current vision screenings being conducted in the school and if teachers feel that these screenings are sufficient for detecting vision problems. The survey also asked if the teachers would like more education on vision and its effect on the learning process, among other questions.

Results: Of 78 respondents, 100% agree that vision impacts a child's performance in every subject, as well as standardized testing. Approximately 84.6% of teachers would argue that vision screenings should be performed every year, while 80.8% agree that children should have a comprehensive eye examination by an eye specialist before entering first grade. Of the 80.8%, approximately 57% believe it should be Michigan law to require this complete ocular examination. Approximately 60% of teachers are interested in implementing a computer software program that works on eye tracking skills

as well as math and reading, while 71.8% were also interested in implementing non-computer activities such as worksheets or games.

Conclusions: Michigan elementary teachers overwhelmingly support children having a complete eye examination prior to first grade and slightly over half feel it should be mandated by state law. The teachers agree that school vision screenings detect some, but not all vision factors that influence a child's academic performance.

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Introduction:

According to the American Public Health Association, about 10% of children under the age of five have eye or vision problems.¹ It is well established that vision and learning are related. In fact, the visual system accounts for 80% of a child's learning.² In many cases, teachers are the first to notice learning and vision problems in elementary-aged children, as they spend the majority of the working day with the child. School vision screenings for children are an important part of catching major vision problems, such as refractive error, abnormal phoric postures, strabismus, amblyopia, ptosis, unequal pupils, nystagmus, and gross eye abnormalities.¹ However, vision problems, such as poor eye tracking and diplopia, usually go undetected with typical in-school screenings.

Currently in the State of Michigan, vision screenings are held prior to entering kindergarten and in grades 1, 3, 5, 7, and 9 and again as part of drivers training.¹ However, according to the Michigan Optometric Association, a vision screening can miss up to 60% of children with vision problems.⁴ For this reason, children should have a thorough eye examination with an optometrist or an ophthalmologist before entering first grade. An online survey was dispersed to elementary school teachers to assess their knowledge and concerns regarding school vision screenings, and if they feel a complete eye examination for young children should be mandated to maximize their learning potential, among other questions.

Methods:

Surveys were sent via email (Appendix A) to 10 teachers of grades kindergarten to sixth grade in 50 randomly selected elementary schools throughout Michigan. The survey was designed to reach 500 teachers within those 50 elementary schools. The

response rate goal was set at 20%, equaling 100 responses. Teachers were directly emailed (Appendix A), and their email addresses were obtained from the schools' websites. The survey (Appendix B) was internet-based and the teachers were given a link to www.quicksurveys.com to take the anonymous survey. The survey asked about the current vision screenings conducted in their school and if they feel these screenings are sufficient for detecting vision problems. The teachers were also asked about vision and academic performance, if they felt that children should have a complete eye examination by an eye care provider before entering first grade, and if that eye examination should be mandated by state law. The survey also included questions about the current referral system if a student should fail the school vision screening. In addition the survey asked if the teachers would implement activities into their curriculum that helped children with eye tracking, and if they would like more education on vision and its effect on the learning process. The survey was made available for two weeks after the first email was sent. A second email was sent one week after the initial invitation to all teachers as a reminder to take the survey.

Results:

The survey was emailed to 500 teachers in 50 randomly selected elementary schools. The response rate was less than the 20% goal with only seventy-eight teachers responding to the survey, about 15.6% of the total teachers contacted. The response rate was influenced by school webpage filters and restrictions evidenced by emails from teachers who wanted to complete the survey but were unable. The teachers that did complete the survey represented 29 out of the 83 counties in Michigan and about 78% have been teaching over 10 years. The majority of responses were received from

kindergarten teachers at 23.1% and the fewest from 6th grade teachers at 2.6%. About 71.8% of respondents live in semi-rural areas with a population of less than 50,000.

In an effort to learn more about vision screenings across Michigan, the survey involved multiple background questions. Just over half of the teachers, 53.9%, reported that vision screenings were conducted every two years and the majority of teachers, 84.6% agreed that screenings should be performed every year. Surprisingly, 5.1% of teachers reported that there are not any vision screenings in their district. About 75.6% of teachers feel that the vision screenings do not catch all vision problems that may impede a child's educational success while 100% of teachers would argue that at least some vision problems are flagged. About 12.8% of respondents are dissatisfied with the thoroughness of the vision screenings, while 26.92% are neutral. Almost 17% are dissatisfied with the ability of the screening to detect vision problems, with 37.2% being neutral. The majority of respondents, at about 75.6%, have reported that the local health department conducts the vision screenings. Interestingly, 3.8% of teachers reported that an eye care provider conducts the vision screenings at their school district whereas about 9% are unsure as to who is conducting the screenings.

Not surprisingly, 100% of respondents agree that vision affects a child's performance in every subject and that a vision problem could detrimentally affect a child's performance on standardized testing. An astounding 80.8% of teachers would agree that a comprehensive eye examination would be beneficial for students prior to entering first grade, while only 56.8% of teachers believe it should be mandated by Michigan Law.

Importantly, 43.6% of respondents are concerned that the referral system upon failing a vision screening is not effective. Sadly, 62.8% of respondents are not aware of a

pediatric eye care provider to send referrals upon noticing visual symptoms that may warrant a comprehensive eye examination. Similarly, 39.7% of teachers are unsure of the nearest need-based clinic, while another 28.2% were unaware need-based clinics exist at all. Sixty percent of teachers are interested in implementing a computer software program that works on eye tracking skills as well as math and reading while 71.8% were interested in implementing non-computer activities such as worksheets or games. A little less than 35% of teachers responding prefer a lecture given by an eye care provider in order to learn more about which symptoms may be related to vision problems, whereas 25.6% and 21.5% prefer an e-mailed document or a website, respectively. Almost half of respondents at 46.2% prefer a lecture to learn more about visual information processing and vision related learning problems. Please see Appendix B for comprehensive survey results.

Discussion:

Despite the low response rate, the survey provides valuable information concerning school children's vision in Michigan. A majority of the teachers, 78%, have been teaching over 10 years, implying that the teachers are experienced with observing their students' needs and struggles in the classroom, skewing results toward experienced observation. The teachers are from 29 different counties in Michigan creating a wide range of backgrounds within various communities, with different socio-economic and geographic environments. The survey participants fairly represent each elementary grade level, including K-6. This stratification is helpful since different visual symptoms and deficiencies may commonly arise at certain grade levels. Overall, the survey participants

are diverse and provide a good representation of elementary school teachers across Michigan.

Over half of teachers stated that the students receive vision screenings every two years with about 30% stating their students receive screenings every year. Surprisingly, 5% of teachers said that their students do not attend vision screenings at school. It is concerning to think that these children are not even being screened, although it is possible that respondents are simply unaware of the screening process at their schools. The United States Preventative Services Task Force recommends vision screenings be performed on children ages 3-5 years at least once.⁷ It is unclear as to the reason screenings are not being performed at these districts however one can postulate it is likely a combination of lack of funds and/or awareness. Further, 85% of Michigan teachers agreed that vision screenings should be provided every year.

Some teachers who were not satisfied with their school screenings had suggested that vision screenings be performed yearly in hopes of catching children with vision problems as soon as possible. That way, students are less likely to fall behind in coursework and learning; the sooner a vision problem is found in a child, the quicker it can be treated. For example, although plastic at any age, the brain is most plastic during childhood, especially in regards to acuity.⁸ If amblyopia is diagnosed secondary to strabismus or refractive error, the best outcomes occur when treated before age nine.⁸ Visual skills, such as tracking, can be taught to be more efficient at any age, however earlier intervention helps alleviate problems that may hinder reading or learning. Further, if these vision screenings included pursuits and saccadic testing, deficiencies in these eye movements would be recognized sooner. Saccadic insufficiency is known to be linked to

reading problems.⁶ If saccadic insufficiency is diagnosed and therapy is implemented, a child's success in the classroom could improve dramatically.⁶ Only 12% of teachers were completely satisfied with their school's vision screenings, while another 13% were dissatisfied leaving most teachers somewhere around neutral. Respondent comments stated that the vision screenings are outdated and that eye tracking and eye teaming should be a part of the screening. One teacher responded that a child passed the school screening, but continued to have problems, at which point the parent took the child to an eye doctor who found the problem. In addition, some respondents pointed out that the children's responses may not be accurate, especially at the kindergarten level due to anxiety of the situation. Based on these comments, if vision screenings were performed by eye care providers or someone trained by eye care providers, the sensitivity and specificity may increase. In fact, a study performed in Kentucky in 2007 suggested that a comprehensive vision examination performed by an eye care provider identified some vision problems that were missed in children's preschool vision screenings held by the state. In that study, 66 children were diagnosed with a vision problem by an eye care provider, while only 10 of those same children were diagnosed at the school's initial vision screening.⁹ This suggests that comprehensive vision examinations by eye care providers are more sensitive than school vision screenings. When asked about the sensitivity of school vision screenings, the majority of responses were neutral. These findings suggest that teachers realize the limitations of screenings and that not all vision problems are flagged.

The large majority of respondent teachers also agreed that vision screenings are thorough enough to flag some, but not all vision problems that could potentially impede a

child's educational success. With the prevalence of attention deficit in the classroom, future studies may look at how often a student is misdiagnosed as having an attention disorder while they actually have a visual problem impeding their learning and mimicking symptoms of inattention.

Significantly, about 85% of Michigan teachers agreed that school vision screenings should be given every year, despite the overall lack of confidence in the screening's sensitivity. It appears respondent teachers take a "some is better than none" approach to using vision screenings to detect vision disorders.

A promising result was that all respondents agreed that vision affects a child's performance in every subject and that a vision problem could detrimentally affect a child's performance on standardized testing. With the current emphasis on the importance of standardized testing as teach and school evaluation tools, this leads to questions about why school districts have not explored improvement and remediation of student vision problems as a priority.

Most teachers also replied that they would be interested in implementing a computer software program and non-computer activities that would improve eye tracking while also working on regular subjects, such as math. This result indicates the importance of eye tracking to reading and learning. However, in the comments, some teachers showed concern about not having time to add this to their current curriculum nor the computers to realistically use the software in the classroom. One teacher had suggested these skills may be best worked on at home just as most optometric vision therapy programs operate.

An overwhelming majority of teachers said that children should have a complete eye exam by an eye care provider before entering first grade, and not just attend a school vision screening. Over half of the teachers responded positively for the implementation of state law requiring a child to receive a complete eye exam by an eye care provider before entering first grade. Teachers appear very aware that vision affects a child's learning potential and future success in the classroom. Teachers seem to understand the benefits of a comprehensive eye exam over school screenings. Teachers want to see their students succeed and want their students to receive eye examinations to help ensure optimal academic performance. Also, the survey question should have been re-worded asking, "based on the fact that there are need-based clinics, do you think it should be Michigan law to require a comprehensive eye examination prior to entering school?" It would be interesting to determine how many of the negative responses in regards to a state law would be persuaded to respond positively when financial need is not a limiting factor.

Unfortunately, the majority of teachers do not know of a pediatric eye care provider to refer their students if they noticed eye problems. This result might be influenced by the caution schools must take in making referrals to a certain provider to avoid political and legal pitfalls. A significant number of respondents, about 44%, felt that their school's current referral system was ineffective. Is there an accurate system in place that ensures an eye care provider addresses the vision problems? Although not addressed by this study, further research on school referral systems is indicated.

It is important for primary care optometrists and pediatric optometrists to educate teachers and local schools on their services in hopes that the information may be passed along to parents of their students in need of pediatric services. The majority of teachers

responded that an in-person educational lecture given by an eye care provider would be the most effective way of conveying information to them about both visual information processing and symptoms of vision related learning problems. Most others said that an emailed document created by an eye care provider or an informational website would be effective. In-services and emailed, printed, or website symptom checklists appear optimal ways to educate teachers based on survey results. As eye care providers, it is not only our job to offer comprehensive eye exams for children, but to also educate teachers and the community about children's eye care and vision related learning problems. Simply reaching out to schools in our communities and meeting with school administrators and teachers, optometrists can make a huge impact on a child's visual well-being as well as their learning potential in school. There are challenges inherent in making connections with local schools, the most formidable of which is simply being allowed access because of political and legal reasons. Other challenges may include lack of teach time for education, in-services and educationals scheduled far in advance by school administrators and the perception of relative unimportance of vision-related topics in the scheme of everything teachers must know to remain current in times of changing standards. In addition, the new health care reform law is addressing children's vision. The health care law highlights children's vision as an essential health benefit. At this time it is unclear as to which services and/or vision needs will be covered for children, likely at the very least a comprehensive eye health exam will be insured. With vision coverage starting in 2014, children should be able to get an eye exam before entering the first grade. However how children's vision services will be defined remains to be seen and the screening versus comprehensive eye examination debate will surely remain a part of this discussion.

Conclusion:

Michigan elementary teachers are keenly aware of the importance of vision to learning and standardized testing. They also recognize that while vision screenings are important, their effectiveness is limited. They overwhelmingly agree with the importance of comprehensive eye examinations prior to first grade for all children. The eye care community must decide if it wishes any change to come about in the school vision programs and, if so, it is obvious that we need to educate the front lines: legislative leaders, school administrators and staff, teachers and parents. As primary eye care providers, optometrists should be eager to provide an annual continuing education course to teachers, educating them on signs and symptoms of vision problems and the relationship between vision and learning. As confirmed by this survey, vision screenings are not comprehensive enough to detect all vision problems. Vision problems go undetected for far too long causing students to struggle throughout their learning career. Many vision problems or impairments are preventable if an eye care provider appropriately diagnoses and treats the student. As partners with our educational system, we can help these innocent young minds move into the future unburdened by visual problems by promoting or even requiring a comprehensive eye examination for all children prior to entering the first grade in a fashion similar to immunizations or medical examinations.

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8. Astle AT, Webb BS, McGraw P V. Can perceptual learning be used to treat amblyopia beyond the critical period of visual development?. *Ophthalmic and Physiological Optics*, Nov 2011;31(6):564–573.
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APPENDIX A

E-MAIL SENT TO TEACHERS

Teachers- we need you! My name is Dr. Sarah Hinkley, Associate Professor at the Michigan College of Optometry at Ferris State University. Students Katie Abata, Katie Schleef and I are conducting a research study that uses a survey to obtain your opinion on important topics related to the adequacy of school vision screenings and other vision related topics. We value your opinion! The survey should only take 5 minutes.

Your responses and identity will remain completely anonymous and by filling out the survey you give us consent for your participation in this survey study, which we hope to publish.

Here's the link to the survey: <http://tolu.na/139ozMs>

Please complete this survey by January 18th, 2013.

We place great value on your opinions and the role you play in the lives of your students. If you have any questions about this study, please do not hesitate to contact Dr. Sarah Hinkley, faculty advisor, at SarahHinkley@ferris.edu or 231-591-2185 or the Chair of the Institutional Review Board at Ferris State University, Dr. Meinholdt, at IRB@ferris.edu or 231-591-2759. We greatly appreciate your time.

Best regards,

Sarah Hinkley, OD, FCOVD
Associate Professor
Chief of Vision Rehabilitation Services

Reminder e-mail:

Dear Teachers,

We would just like to send out a friendly reminder to fill out our survey at your earliest convenience. We will be closing the survey at midnight on this Friday, January 18th. The survey should only take a few minutes of your time and we really appreciate your feedback.

Some of you have expressed concerns about not being able to open the survey. It is unclear to us whether the link in the email is broken or if your school's server is actually blocking the site. In this event, please try copying and pasting the link into the address box of your internet browser. If this still does not work, please complete the survey outside of school, at your home for example.

Thank you again for your cooperation as we look forward to analyzing the results.

Please click on the following link to launch the survey:

<http://tolu.na/139ozMs>

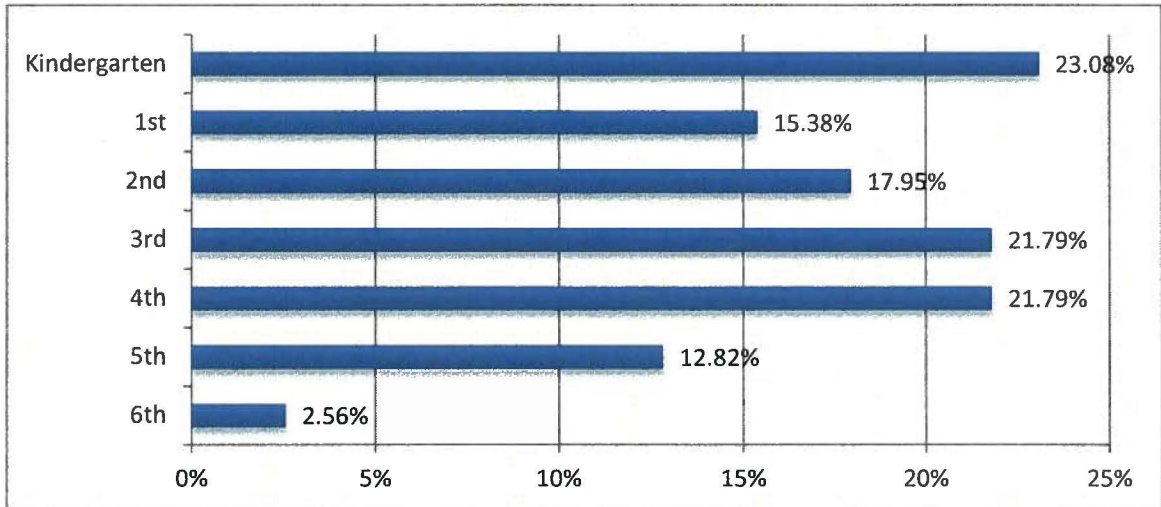
Best regards,

Sarah Hinkley, OD, FCOVD
Associate Professor
Chief of Vision Rehabilitation Services

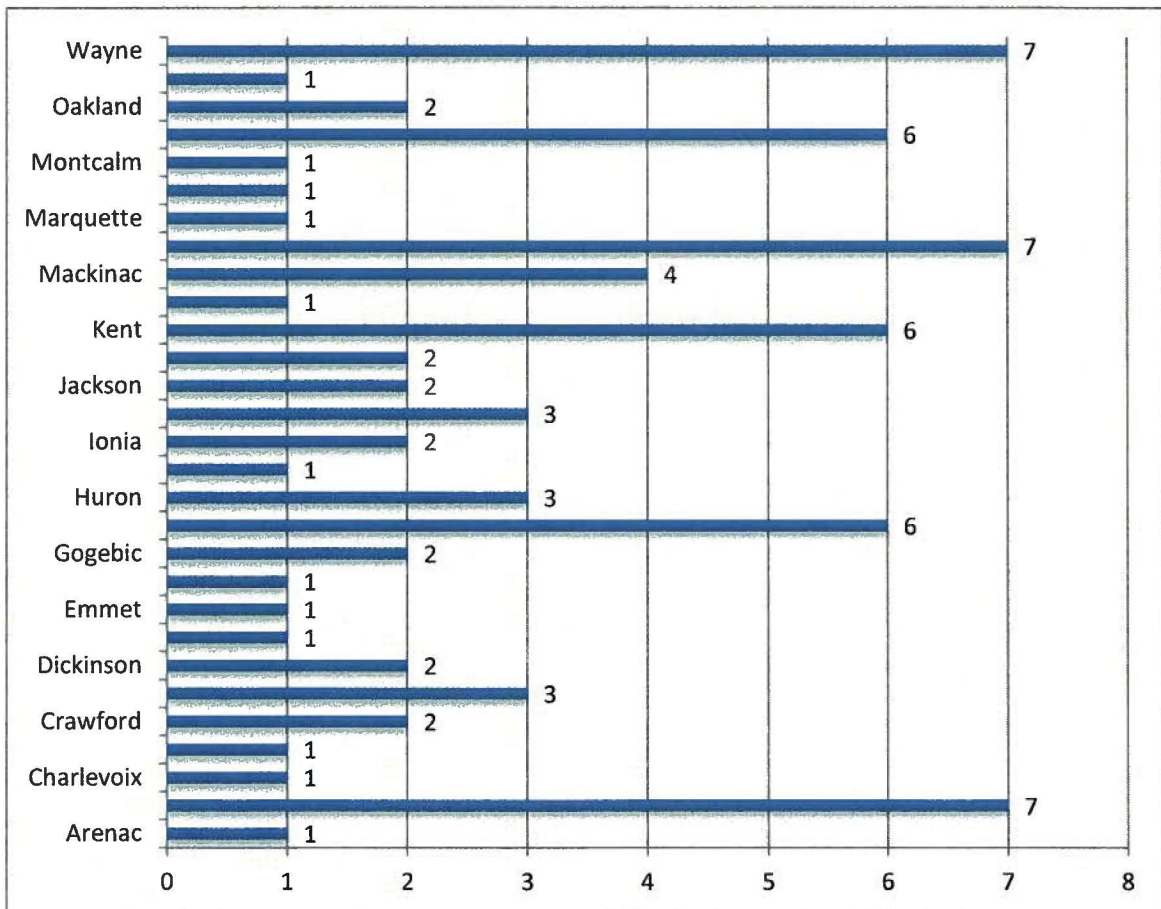
APPENDIX B
SURVEY

Email Survey

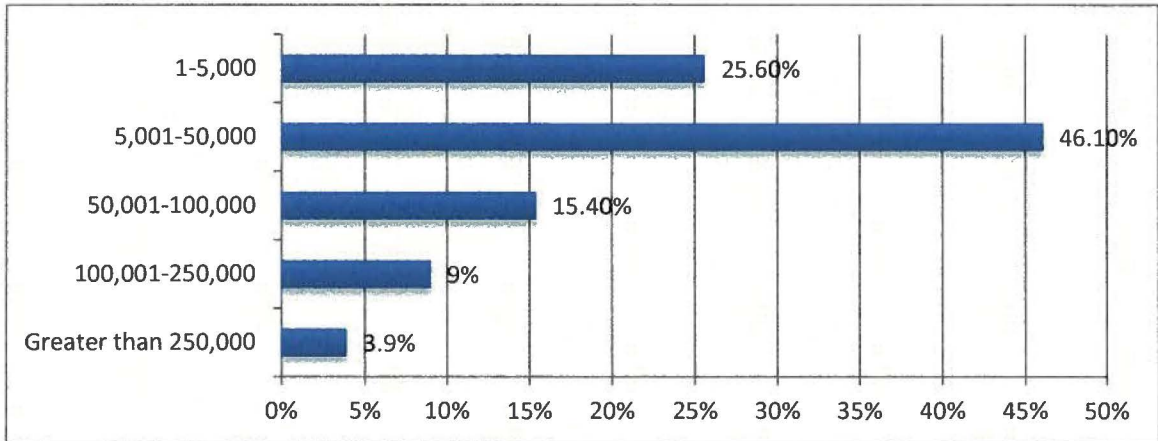
1. What grade do you teach?



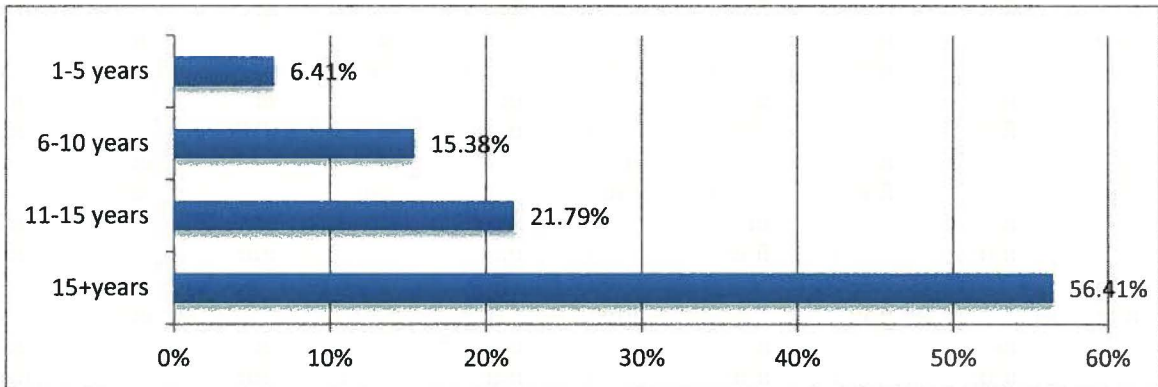
2. In which Michigan County do you live? (chosen from list)



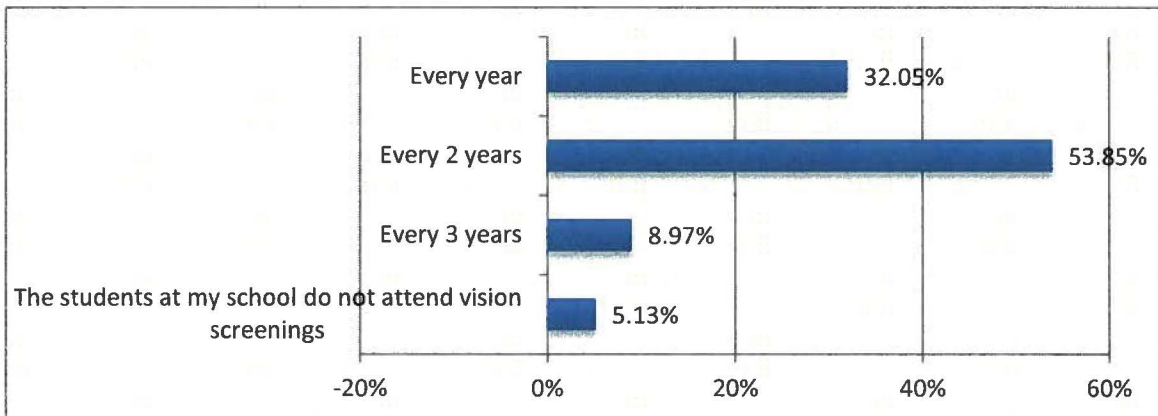
3. Estimate the population of your nearest affiliated city or town.



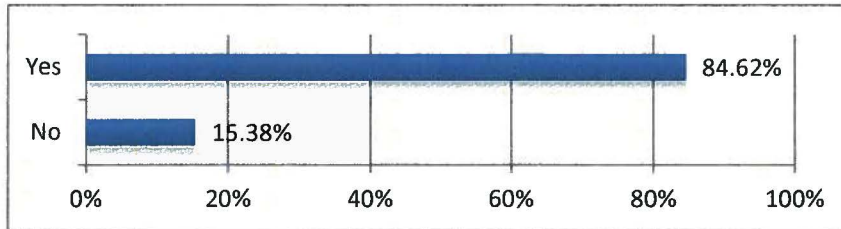
4. How many years have you been teaching?



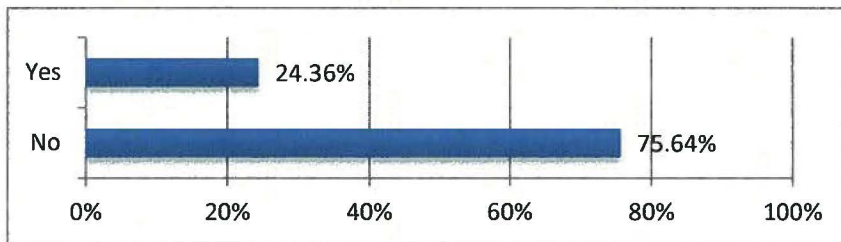
5. How often are students in your school getting vision screenings?



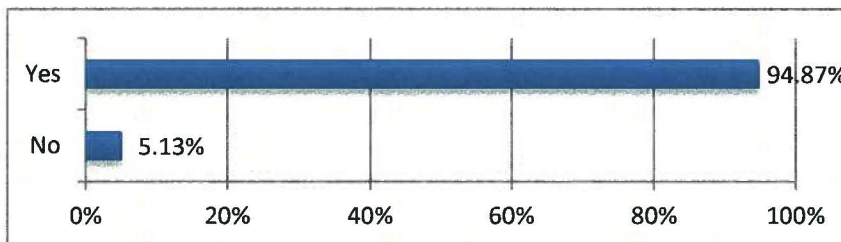
6. In your opinion, should school vision screenings be given every year?



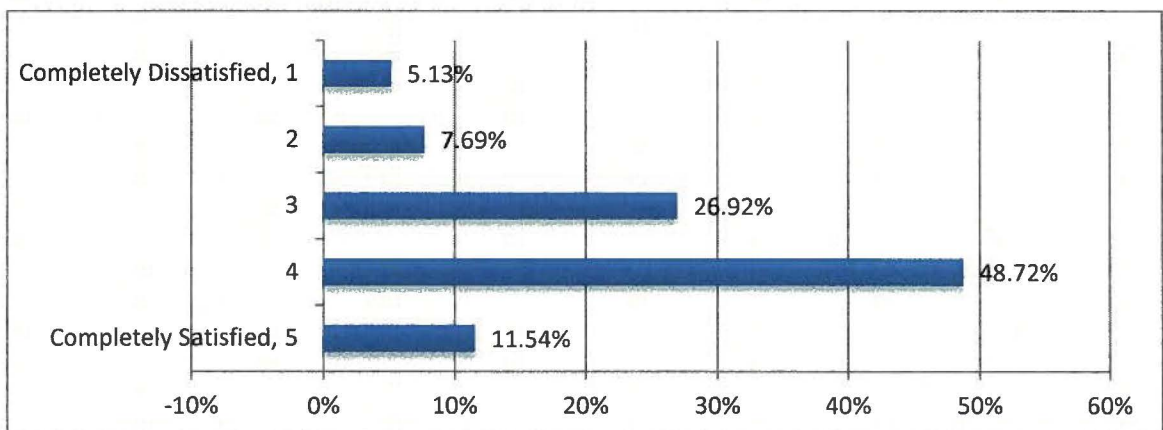
7. Do you feel your school's vision screenings are thorough enough to flag ALL vision problems that might impede a child's educational success?



8. Do you feel your school's vision screenings are thorough enough to flag SOME vision problems that might impede a child's educational success?

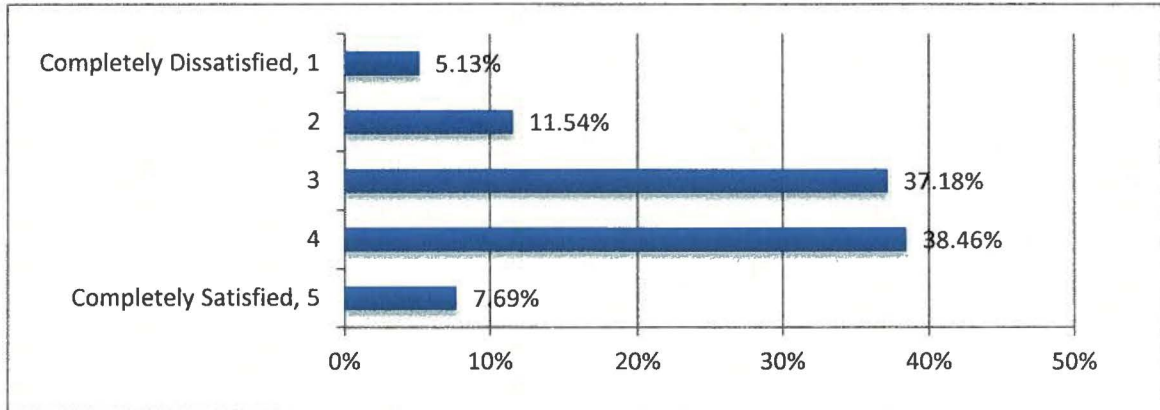


9. On a scale of 1 to 5, with 1 being completely dissatisfied and 5 being completely satisfied, how satisfied are you with your school's vision screening procedure at detecting problems that might impede a child's educational success?

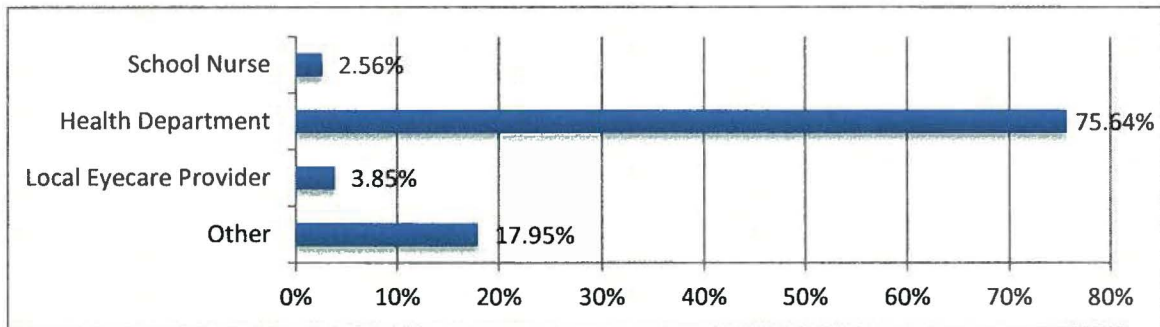


9a. If you answered 1, 2, or 3 to the previous question, what aspects of the screening could be improved?

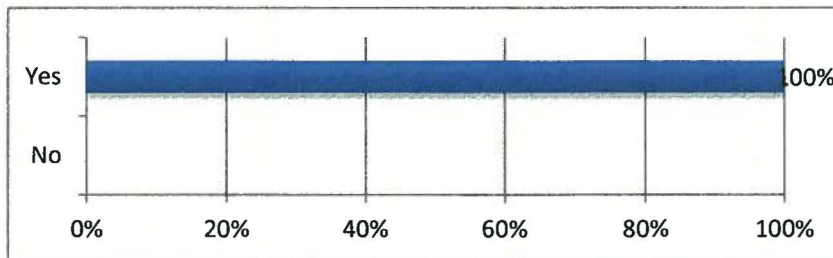
10. On a scale of 1 to 5, with 1 being completely dissatisfied and 5 being completely satisfied, how SENSITIVE are the school vision screenings at detecting problems that might impede a child's educational success?



11. How does your district and/or conduct school vision screenings?

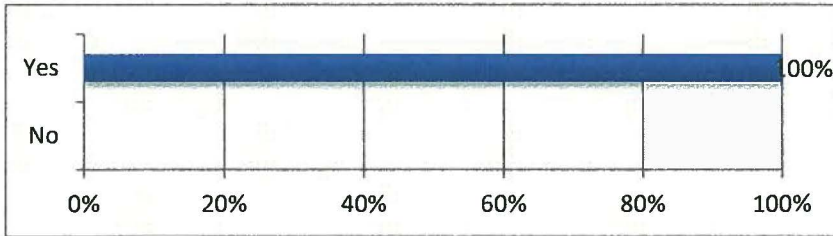


12. Do you feel vision affects a child's performance in every subject?

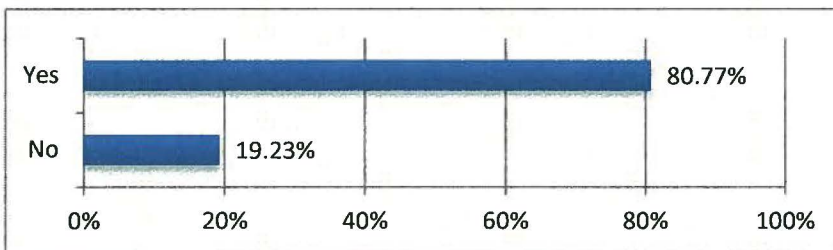


12a. If you answered no to the previous question, what subjects do you feel are not affected by vision?

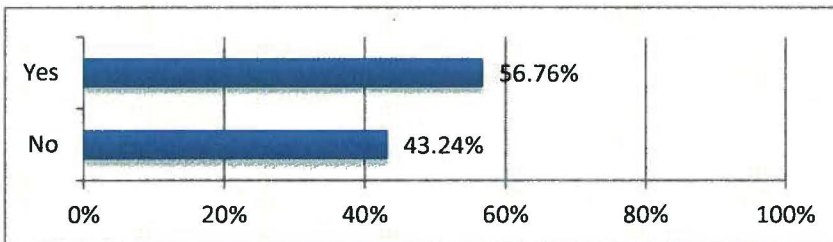
12b. Are you aware that a vision problem could detrimentally affect a child's performance on standardized testing?



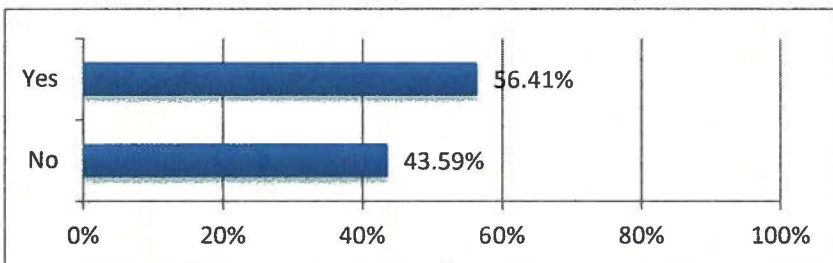
13. Should children have a complete eye exam by an optometrist or ophthalmologist, not just a screening, before entering first grade?



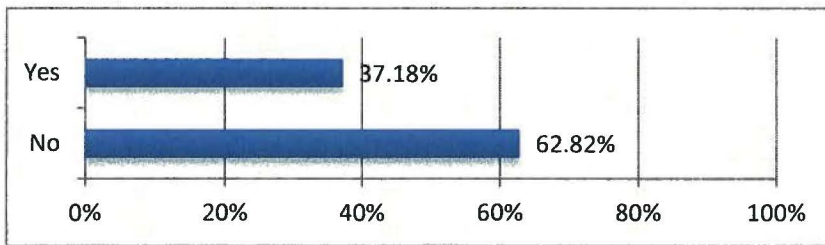
13a. If you answered yes to the previous question, should it become a law in Michigan that all children must show proof of a complete eye exam by an optometrist or ophthalmologist before entering first grade, similar to proof of immunizations?



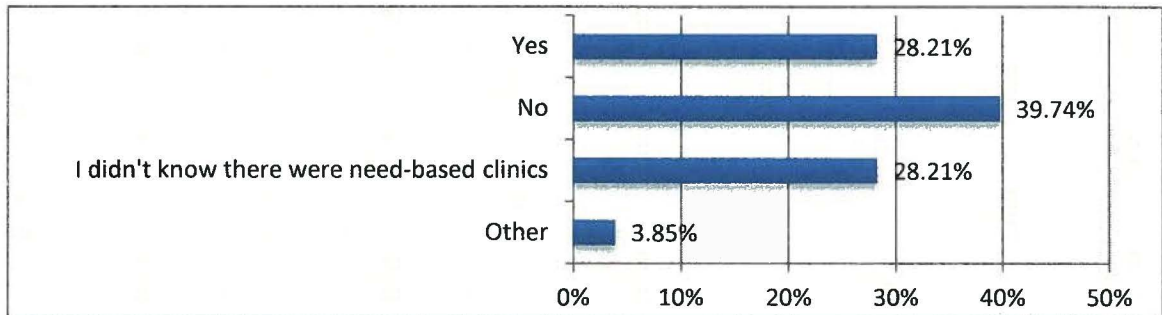
14. Is the current referral system for eye examination effective when a student fails the school vision screening?



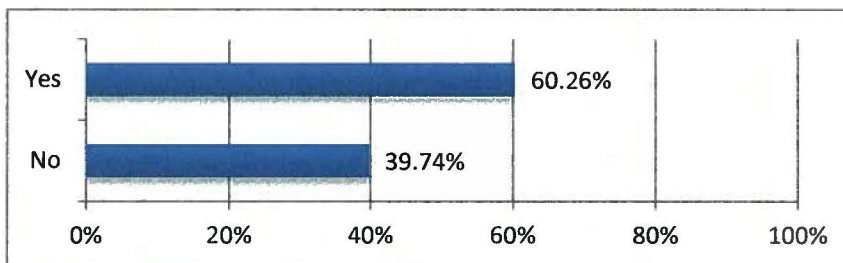
15. Are you aware of a pediatric eye care provider where you can refer students if you notice symptoms that warrant a thorough eye exam?



16. Do you know of any need-based vision clinics, charity program or insurance program in your area that your students can access if finances were an issue for the student's family?

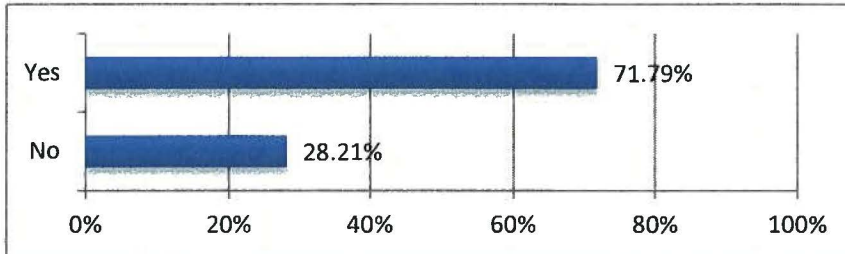


17. Would you be interested in implementing a COMPUTER SOFTWARE PROGRAM that worked to improve eye-tracking skills in your classroom while simultaneously working on classroom subjects like math or reading?



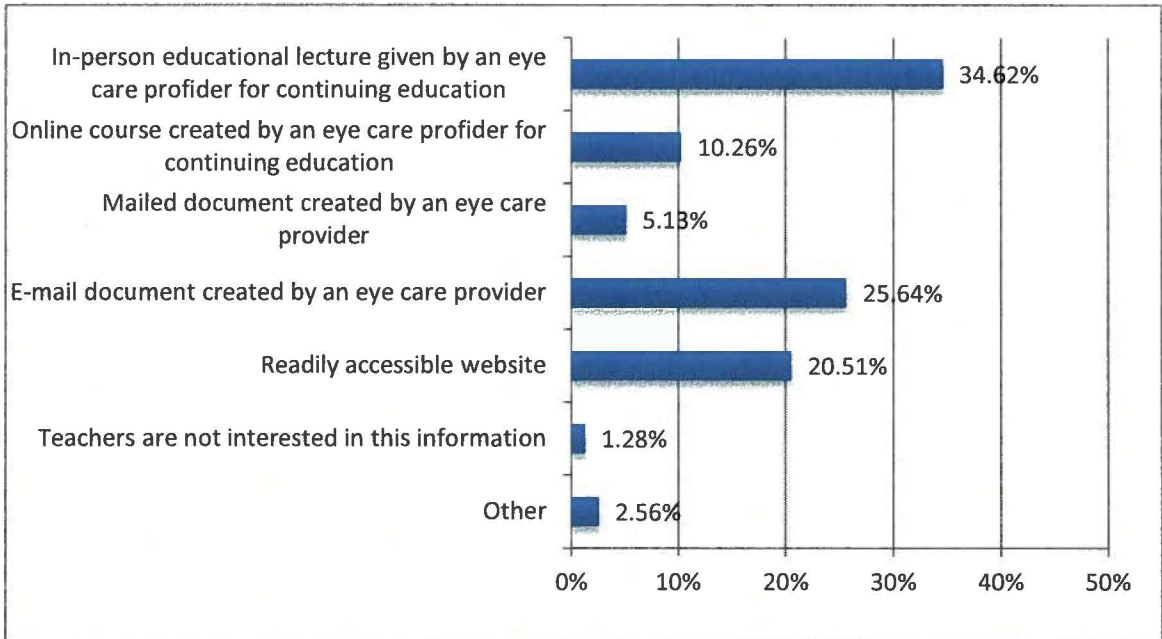
17a. If no, what are the barriers to such a program?

18. Would you be interested in learning and implementing NON COMPUTER-BASED activities or games that enhance eye-tracking skills while simultaneously working on classroom subjects like math or reading?



18a. If no, what are the barriers to such activities?

19. Which delivery system would be most effective in conveying information to teachers regarding SYMPTOMS to look for in vision related problems?



20. Which delivery system would be most effective in conveying information to teachers regarding VISUAL INFORMATION PROCESSING and VISION RELATED LEARNING PROBLEMS?

