Identification of visual problems at the elementary school level

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Pacific University

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Identification of visual problems at the elementary school level

Abstract
This paper examines available visual problem identification literature, and the teachers' willingness to employ this literature in an evaluation of students' visual status. It suggests a need for increased communication between education professionals and vision care specialists at the elementary school level.

Degree Type
Thesis

Degree Name
Master of Science in Vision Science

Committee Chair
Norman S. Stern

Subject Categories
Optometry

This thesis is available at CommonKnowledge: https://commons.pacificu.edu/opt/521
IDENTIFICATION OF VISUAL PROBLEMS
AT THE ELEMENTARY SCHOOL LEVEL

A THESIS
PRESENTED TO THE FACULTY
OF
PACIFIC UNIVERSITY
BY
KENNETH E. EHLLERS
A. YVONNE ARNOLDI

IN PARTIAL FULFILLMENT
OF THE REQUIREMENT FOR THE DEGREE
DOCTOR OF OPTOMETRY
FEBRUARY 1979

ADVISOR

[Signature]

NORMAN S. STERN, O.D., Ph.D.
Accepted by the faculty of the College of Optometry, Pacific University, in partial fulfillment of the requirements for the Doctor of Optometry degree.

Thesis Advisor

Kenneth E. Ehlers

A. Yvonne Arnoldi
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ACKNOWLEDGEMENTS

The authors wish to extend their appreciation and gratitude to Dr. Norman Stern for his guidance and encouragement in conducting this research.

We owe a debt of gratitude to the library staff for their efforts on the literature search of previous research in this area.

We thank Phi Theta Upsilon, Optometry Fraternity, and the Oregon Optometric Association for contributing a share of the funds required to conduct the study.

We also express our deepest appreciation to the Superintendents, Principals and Teachers of the elementary schools in the Hillsboro, Forest Grove, Gaston and Banks School Districts, without whose support this study could not have been undertaken.

K.E.E.

A.Y.A.
ABSTRACT

This paper examines available visual problem identification literature, and the teachers' willingness to employ this literature in an evaluation of students' visual status. It suggests a need for increased communication between education professionals and vision care specialists at the elementary school level.
INTRODUCTION

It has long been recognized that the visual efficiency with which a child operates has an enormous impact on the ability to realize maximum learning potential. It is therefore imperative that any visual difficulties that are developed by the child be identified and corrected as early as possible to minimize handicaps imposed on the learning process. Ideally, this would be achieved through an early visual examination, preferably long before formal schooling begins. Follow-up examinations would be regularly scheduled to monitor possible development of visual difficulties and again minimize any adverse effects of an increasingly near-centered environment. Often, this is not the case, either because parents are unaware of the importance of a complete visual examination, or possible difficulties have not yet been manifested due to a low level of participation with near tasks. It is the teacher, therefore, that comes to occupy that position which is best suited for critical observation of a child's performance in a learning situation.

In order to determine the aids that are available and could be used in assessing a child's visual status by those in the teaching profession, we conducted a literature search, utilizing independent library research, Psychological Aspects, Educational Resources Information Center (ERIC)
and Visual Science Information Center (VSIC). In addition, literature from the American Optometric Association, the Optometric Extension Program, the American Academy of Ophthalmology, and the National Society for the Prevention of Blindness (NSPB), as it pertained to children's vision, was obtained. From this information we were able to select those publications that lent themselves to use by the layman, be it parent or teacher, in the initial evaluation of a child's visual abilities.

Primarily, these publications, with the exception of a screening "kit" that is available from the NSPB, take the form of checklists. Appendix I represents a compilation of the most commonly available pamphlets and the signs and symptoms of visual distress that is included in each of them. The screening kit that is available from the NSPB includes a checklist of signs and symptoms as well as Snellen acuity chart, cover cards, window cards and instructions.

It is obvious that the disciplines concerned with visual care, as well as independent vision organizations, have developed useful materials pertaining to the monitoring of a child's visual status. However, the materials are only useful if those for whom they are intended are aware of their existence and are willing to employ them. The objective of this thesis is to determine the awareness of
the teaching profession relative to existing visual
problem identification literature, and aids and their
attitude towards utilization of same.
SUBJECTS

The subject population included approximately two hundred teaching professionals of varied educational and experiential background associated with the Hillsboro, Forest Grove, Banks and Gaston School Districts, involved in teaching children from kindergarten through the fifth grade level. This population was felt to represent the rural, suburban and urban distribution of school systems and teachers, and was ideally suited as the subject of a survey relating to children's visual status.

METHODS AND MATERIALS

A questionnaire was distributed to each of the above subjects (Table I). A comparison of the responses was made to determine educational background, experiential level, knowledge of visual problem identification literature and attitudes towards participation in preliminary vision screening in the classroom.
TABLE I

On any question with multiple answers, please check all those applicable.

1. How many students are there in your homeroom? _______
   How many students do you teach other than your homeroom members? _______

2. What grade or grades do you teach?
   K ___ 1___ 2___ 3___ 4___ 5___

3. At what type of institution did you receive your training?
   Large state institution (3000 and above) ______
   Small state institution (below 3000) ______
   Large private institution ______
   Small private institution ______

4. Please check your age bracket:
   20 - 25 _____ 26 - 30 _____ 31 - 35 _____
   36 - 40 _____ 41 - 45 _____ 46 - 50 _____
   51 - 55 _____ 56 - 60 _____ 61 - 65 _____

5. Please check level of your education:
   Bachelors Degree ______
   Masters Degree ______
   Doctorate Degree ______
   Other ______

6. How many years of teaching experience do you have? _____

7. Sex:  M _____ F _____
<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Do each of your students have a visual check-up performed at the school at least once during the school year?</td>
<td>___</td>
</tr>
<tr>
<td>9. Is this check-up performed by:</td>
<td></td>
</tr>
<tr>
<td>Teacher</td>
<td>___</td>
</tr>
<tr>
<td>School Nurse</td>
<td>___</td>
</tr>
<tr>
<td>Other (specify)</td>
<td>___</td>
</tr>
<tr>
<td>10. What do you use for a guideline in identifying visual problems in your students?</td>
<td></td>
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<tr>
<td>College courses</td>
<td>___</td>
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<tr>
<td>Independent study</td>
<td>___</td>
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<tr>
<td>Pamphlets</td>
<td>___</td>
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<tr>
<td>Other (please specify)</td>
<td>___</td>
</tr>
<tr>
<td>None</td>
<td>___</td>
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<tr>
<td>11. Do you find these guidelines useful? Yes No</td>
<td>Yes No</td>
</tr>
<tr>
<td>12. If answered No above, please indicate why:</td>
<td></td>
</tr>
<tr>
<td>Lack of clarity</td>
<td>___</td>
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<tr>
<td>Too broad</td>
<td>___</td>
</tr>
<tr>
<td>Too time consuming</td>
<td>___</td>
</tr>
<tr>
<td>Other</td>
<td>___</td>
</tr>
<tr>
<td>13. How often during the school year would you consider it feasible to conduct a visual test?</td>
<td>None Once Twice</td>
</tr>
<tr>
<td>14. Given the number of students in your class, for how long a continuous period could you allocate for visual testing?</td>
<td>0 min. 5 min. 10 min. 15 min. 20 min. 30 min. More than 30 min.</td>
</tr>
</tbody>
</table>
TABLE I (cont'd)

15. What conditions or situations would you prefer in applying visual testing to students?

Teacher to student (private) ____
Teacher to student (classroom) ____
Competition between students ____
Team competition ____

16. What type of test symbols would you prefer?

Letters ____ Games ____ Objects ____
Numbers ____ Words ____ Geometric shapes ____

17. Have any pamphlets or checklists concerning children's visual problems been made available to you for your use in the classroom?

Yes ____ No ____

18. Would you use a checklist of overt visual symptoms to inform parents of a student's visual problems?

Yes ____ No ____

19. Would you use a checklist designed to uncover more subtle visual problems that may be present in children operating below potential, i.e., reading difficulties, behavior patterns, postural patterns?

Yes ____ No ____

20. Would you be interested in receiving information on visual problems in children?

Yes ____ No ____
TABLE II

Results from teacher questionnaire:

1. At what type of institution did you receive your training?
   - Large state institution (300 and above) 42%
   - Small state institution (below 3000) 21%
   - Large private institution 5%
   - Small private institution 32%

2. Please check your age bracket:
   - 20-25 ... 8%  45-50 ... 8%
   - 26-30 ... 23%  51-55 ... 6%
   - 31-35 ... 17%  56-60 ... 8%
   - 36-40 ... 11%  61-65 ... 4%
   - 41-45 ... 15%

3. Please check level of your education:
   - Bachelors degree .......... 76%
   - Masters degree .......... 16%
   - Doctorate degree .......... -
   - Other ..................... 8%

4. How many years of teaching experience do you have?
   - 1 - 5 years ............... 29%
   - 6 - 10 years ............. 31%
   - Over 10 years .......... 40%

5. Sex:  Male ... 20%  Female ... 80%

6. Does each of your students have a visual check-up performed at the school at least once during the school year?
   - Yes .... 97%  No ........ 3%
TABLE II (cont'd)

7. Is this check-up performed by:

Teacher ........ 23%    Others ........ 8%
School Nurse .. 32%     Teachers Aides
Parents ........ 23%     Screening
Others ........ 8%

Optometrist
County Service
Specialist
Student Nurse
I.E.D.

8. What do you use for a guideline in identifying visual problems in your students?

College courses ...... 16%
Independent study .... 10%
Pamphlets ............ 15%
Observation ........... 26%
None .................. 5%
Other .................. 28%
    Eye chart
    School Nurse
    Experience
    Student's work
    Screening
    Special Education Referral
    Optometric Advice
    Pacific University
    Another teacher's advice
    Student's complaints
TABLE II (cont'd)

Previous information on child
Speaker's comments
Check-up
Magazines

9. Do you find these guidelines useful?
   Yes ... 75%
   No .... 25%

10. If answered No above, please indicate why:
    Lack of clarity ...... 43%
    Too broad ............. 39%
    Too time-consuming ... 18%

11. How often during the school year would you consider it feasible to conduct a visual test?
    None .................. 1%
    Once ................... 50%
    Twice ................... 49%

12. Given the number of students in your class, how long a continuous period could you allocate for visual testing?
    0 minutes .............. 1%
    5 minutes .............. 12%
    15 minutes .............. 4%
    20 minutes .............. 7%
    30 minutes .............. 25%
    More than 30 minutes . 47%
### TABLE II (cont'd)

13. What conditions or situations would you prefer in applying visual tests to students?

- Teacher to student (private) ........ 71%
- Teacher to student (classroom) ...... 23%
- Competition between students ........ 4%
- Team competition ................... 2%

14. What type of test symbols would you prefer?

- Letters .................. 25%
- Objects ................... 20%
- Geometric shapes ...... 18%
- Numbers .................. 15%
- Words ...................... 12%
- Games ..................... 10%

15. Have any pamphlets or checklists concerning children's visual problems been made available to you for use in the classroom:

- Yes ... 31%  
- No ... 69%

16. Would you use a checklist of overt visual symptoms to inform parents of a student's visual problems?

- Yes ... 85%  
- No ... 15%

17. Would you use a checklist designed to uncover more subtle visual problems that may be present in children operating below potential, i.e., reading difficulties, behavior patterns, postural patterns?

- Yes ... 90%  
- No ... 10%
18. Would you be interested in receiving information on visual problems in children?

Yes ... 96%    No ... 4%
TABLE III

Confidence levels were computed on the following questions:

Basic formula \( P \pm 2.58 \sigma_p \)  
99% confidence

\[ \sigma_p = \sqrt{p(1-p)N} \]

<table>
<thead>
<tr>
<th>Question</th>
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<tr>
<td>9. Teacher</td>
<td>.23 ± .07</td>
</tr>
<tr>
<td>School nurse</td>
<td>.32 ± .08</td>
</tr>
<tr>
<td>Parents</td>
<td>.23 ± .07</td>
</tr>
<tr>
<td>P.E. Teacher</td>
<td>.14 ± .06</td>
</tr>
<tr>
<td>Other</td>
<td>.08 ± .05</td>
</tr>
<tr>
<td>10. Observation</td>
<td>.26 ± .08</td>
</tr>
<tr>
<td>Pamphlets</td>
<td>.15 ± .07</td>
</tr>
<tr>
<td>College courses</td>
<td>.16 ± .06</td>
</tr>
<tr>
<td>Independent study</td>
<td>.10 ± .06</td>
</tr>
<tr>
<td>Other</td>
<td>.28 ± .09</td>
</tr>
<tr>
<td>11. =</td>
<td>.75 ± .11</td>
</tr>
<tr>
<td>15. Private</td>
<td>.71 ± .10</td>
</tr>
<tr>
<td>Classroom</td>
<td>.23 ± .09</td>
</tr>
<tr>
<td>Competition</td>
<td>.04 ± .04</td>
</tr>
<tr>
<td>Team Competition</td>
<td>.02 ± .03</td>
</tr>
<tr>
<td>17. =</td>
<td>.69 ± .10</td>
</tr>
<tr>
<td>18. =</td>
<td>.85 ± .08</td>
</tr>
<tr>
<td>19. =</td>
<td>.90 ± .07</td>
</tr>
<tr>
<td>20. =</td>
<td>.96 ± .04</td>
</tr>
</tbody>
</table>
RESULTS

A total of 213 questionnaires were distributed to elementary school teachers associated with kindergarten through fifth grades. Sixty-nine percent, or 147, of the questionnaires were returned.

A compilation of the returns disclosed that 97% of the students are currently receiving visual screening at least once during the school year. The screenings are performed by personnel from various disciplines, including teachers (23%), the school nurse (32%), parental volunteers (23%), and other designated individuals (22%). Not only are the visual screening personnel multi-disciplined, but the guidelines or tools used by educators in classroom identification of visual problems proved equally inconsistent.

The reported guidelines included independent study (10%), college courses (16%), observation of the children (26%), pamphlets (15%), and a broad spectrum of personal sources which totaled 28% (Figure 1). An additional five percent indicated no guidelines were being utilized in any fashion. Seventy-five percent of those reporting use of a guideline felt they were useful, while the remainder (25%) indicated the guidelines available were not satisfactory because they lacked clarity (43%), were too broad in scope (39%), or were too time-consuming (18%).
(Figure 2). The responses also indicated a high degree of willingness to allocate substantial class time towards application of existing or alternate guidelines in visual status testing.

A full fifty percent of the teachers considered it feasible to conduct a visual screening once during the school year, almost half (49%) favored conducting this activity twice, while one percent preferred no time allocation in any form. (Figure 3). Forty-seven percent of those surveyed were willing to allocate more than thirty minutes to the visual testing process, (Figure 4), and 71% indicated a preference that the testing be conducted in a private teacher-to-student format. (Figure 5).

Sixty-nine percent of the respondents had not received any literature in the form of pamphlets or checklists concerning identification of visual problems. (Figure 6). However, 96% indicated interest in receiving additional information disclosing signs and symptoms of visual disturbances. (Figure 7). Eighty-five percent would employ a checklist concerning overt symptomatology, while 90% would utilize a tool designed to identify those symptoms associated with the more subtle visual disturbances. (Figure 8).
The relative frequency distribution of the guidelines currently used by teachers in identifying visual problems.

FIGURE 1

The relative frequency distribution of the usefulness of the guidelines currently used by teachers in identifying visual problems.

- Useful
- Not Useful

Reasons:
- Lack of clarity (43%)
- Too broad (39%)
- Too time consuming (18%)

FIGURE 2
The relative frequency distribution of the preferred number of visual tests to be administered each year.

FIGURE 3

The relative frequency distribution of the minutes allocated for visual testing.

FIGURE 4
The relative frequency distribution of the preferred conditions under which visual testing to be performed.

- Teacher/Student (Private)
- Teacher/Student (Classroom)
- Individual Competition
- Team Competition

**Figure 5**

The relative frequency distribution of the number of teachers that have received pamphlets or checklists concerning visual problems.

**Figure 6**
The relative frequency distribution of the number of teachers interested in receiving more information on the identification of visual problems.

![Figure 7]

The relative frequency distribution of the willingness of teachers to utilize pamphlet or checklist material in identifying visual problems.

![Figure 8]
DISCUSSION

Vision is defined as: "The special sense by which objects, their form, color, position, etc., in the external environment are perceived...", while visual acuity is defined as: "Clearness, distinctness, sharpness." Many of the school visual checks consist of a single visual acuity test with the distance eye chart. The inadequacy of this method was commented on by one teacher, who noted "The present method of testing in schools is unsatisfactory." In addition, Joel N. Zaba, M.A., O.D., states: "The inadequacy of a chart at twenty feet as a definitive vision screening technique has become quite apparent." It seems obvious from these statements that visual tests must entail more than a simple visual acuity check. The child who is performing below his grade potential, due to visual problems, possibly could be identified if the teacher was provided with specific aids in discerning underlying signs and symptoms.

Several organizations have published materials in checklist form designed to guide educators in the preliminary evaluation of a child's visual status. These checklists are primarily divided into three categories: complaints, behavior and physical appearance. These publications are fairly consistent in their treatment of complaints and of physical appearance of the child with
the latter containing four common elements of identification, i.e., excessive blinking, rubbing eyes, head tilt or thrust and asthenopia symptoms. Very little similarity exists in the evaluation of behavioral characteristics of the various checklists. The Educator's Guide to Classroom Vision Problems is the most comprehensive, with A Teacher's Guide to Vision Problems and Eye Cues for Eye Care of Children following quite closely in content. Concerning the subject of behavior, the publications appear to contain the subtle signs and symptoms desired by ninety percent of the surveyed teachers. These subtle signs, of smooth binocularity, visualization, and integration of egocentric and oculocentric directionality, are directed towards observation of a child during the reading process.

An unsolicited response by over one-fourth of the teachers, was their use of "observation" as a guideline in identifying visual problems. As the checklists are geared toward this method of identification, they could serve as a useful tool. Two-thirds of the teachers responded that pamphlets and checklists had not been made available to compliment what they were presently using. One guideline currently being used, by sixteen percent, is material offered in their college curriculum. Courses that contain material related to the visual system include Developmental Psychology,
Education Psychology and Psychology of Reading. There are a large number of texts being used that vary widely in their coverage of the visual system. The quality of the material which the teachers were exposed to as students ranges from mere definitions of visual terminology to a more comprehensive discussion of perceptual development. Other guidelines utilized were generally the result of independent study on the part of the teacher. Sources used in their study included the school nurse, other colleagues, professional acquaintances, student feedback and magazine articles. Although 95% have a guideline they are using, 96% indicated they would appreciate receiving more information.

The teachers interest in recognizing visual problems was clearly demonstrated by their willingness to employ checklists of overt and subtle signs and symptoms and to allocate as much time as needed for visual testing. Seventy-one percent preferred this testing be done on a one-to-one basis between student and teacher. An expressed teacher concern was the difficulty encountered in communicating to the parents, a child's need of vision care and obtaining an adequate explanation of the diagnosis provided by the eye care specialist. An additional suggestion was the pooling of resources of Education and Optometry to provide a team approach. Moreover, through their comments,
several teachers expressed a desire for an in-service pro-
gram designed to increase their background knowledge of the
diagnosis and treatment of visual problems in children.
There is a program published by the Optometric Extension
Program that sets forth a method by which in-service
training might be conducted. Regarding this program, J.
Floyd Williams, O.D., states: "The primary purpose of the
program was to help teachers insure better vision and
perception care for children as it relates to their
readiness for scholastic achievement."
CONCLUSION

Our survey has demonstrated that the teachers are willing to employ pamphlets and checklists in the daily evaluation of their students. Currently, only 15% are doing so, and over two-thirds of the teachers have never received any of the publications available.

Moreover, they would appreciate a better background in the diagnosis and treatment of visual problems as could be provided through existing in-service programs. Such a program would serve to open communication channels between vision care professionals and educators, allow for more effective utilization of available publications and provide a foundation for more efficient health care delivery.

Inasmuch as there is inadequate communication between the two professions, it therefore seems appropriate for vision care specialists to make available adequate guidelines and provide the necessary training for their use.
APPENDIX I

The following publications are referred to by number, as indicated below.

1. EYE CUES FOR EYE CARE FOR CHILDREN
   American Association of Ophthalmology
2. CHECK YOUR CHILD'S VISION
   American Optometric Association, Inc.
3. A TEACHER'S GUIDE TO VISION PROBLEMS
   American Optometric Association
4. DO YOU KNOW THESE FACTS ABOUT VISION AND SCHOOL ACHIEVEMENT?
   American Optometric Association
5. A GUIDE FOR EYE INSPECTION AND TESTING VISUAL ACUITY OF PRESCHOOL AGE CHILDREN
   National Society for the Prevention of Blindness, Inc.
6. A GUIDE FOR EYE INSPECTION AND TESTING VISUAL ACUITY OF SCHOOL AGE CHILDREN
   National Society for the Prevention of Blindness, Inc.
7. SIGNS OF POSSIBLE EYE TROUBLE IN CHILDREN
   National Society for the Prevention of Blindness, Inc.
8. EDUCATOR'S GUIDE TO CLASSROOM VISION PROBLEMS
   Optometric Extension Program Foundation, Inc.

APPEARANCE

<table>
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<td>Lids red, encrusted, swollen</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Recurring Styes</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>x</td>
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<td>Red Eyes</td>
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<td>Turned eye</td>
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<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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COMPLAINTS

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<td>Blurred vision at near</td>
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<td>x</td>
<td>x</td>
<td>x</td>
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<td>Blurred vision at far</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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### APPENDIX I (cont'd)

#### BEHAVIOR

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