Computer Ergonomics for Teachers and Students

Inger M. Williams, Ph.D.
Cergos
Tom Cook
Oregon Public Education Network (O.P.E.N.)
Tami Zigler
O.P.E.N.

This project was supported by a Grant from Or-OSHA 1998/99
“it is the duty of parents and those who act for them to take care that the school-room shall be placed where the children may acquire the use of their intellectual faculties without having their physical organization disturbed or their vital powers debilitated by a constrained position”

from Zacharkow, D. Sitting, Standing, Chair Design and Exercise, 1988, page 122
Why introduce computer ergonomics in schools?
1. Formative years

Develop physically

Establish habits
2. Cost effective

To make computer ergonomics as easy to apply by our students as it is using a safety belt and bicycle helmet would be a proactive approach to CTD.
3. Multi-user workstations

1st grader

5-6th grader
Is there a need for computer ergonomics in schools?
Participants:

32% (218) returned

- Teachers: 51% (109)
- Other: 8% (16)
- Information specialists: 13% (27)
- Librarians: 18% (39)
- Computer Teachers: 10% (22)
- Kindergarten: 6.4%
- 1st Grade: 18.3%
- 2nd Grade: 16.5%
- 3rd Grade: 18.3%
- 4th Grade: 23.8%
- 5th Grade: 27.5%
- 6th Grade: 9.2%
Teachers concerns about students:

Student workstation **set up**: 74%

Student computer **habits**: 68%

Student **comfort**:
- visual 56%
- back, neck, shoulders 47%
- arms, elbows, hands 40%
Have you ever heard any student complain about discomfort?

<table>
<thead>
<tr>
<th>Type of discomfort</th>
<th>% of teachers reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eyes</td>
<td>17</td>
</tr>
<tr>
<td>Headaches</td>
<td>9</td>
</tr>
<tr>
<td>Wrists</td>
<td>9</td>
</tr>
<tr>
<td>Hands</td>
<td>9</td>
</tr>
<tr>
<td>Arms</td>
<td>9</td>
</tr>
<tr>
<td>Neck</td>
<td>8</td>
</tr>
<tr>
<td>Shoulder</td>
<td>5</td>
</tr>
<tr>
<td>Upper back</td>
<td>4</td>
</tr>
<tr>
<td>Lower back</td>
<td>3</td>
</tr>
</tbody>
</table>
Computer Skills?

- 70% teacher education classes
- 30% workshops
- 84% self-taught

Teacher discomfort?

- 38% visual
- 36% back, neck, shoulder
- 26% arms, elbows,
• 80% want computer ergonomic education for students
  important 34%
  very important 28%
  mandatory 18%

• 75% want computer ergonomic education for teachers
  important 33%
  very important 22%
  mandatory 25%

• 88% no information about computer ergonomics
How can we introduce computer ergonomics into schools?
## When?

<table>
<thead>
<tr>
<th>Grade level</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>43</td>
</tr>
<tr>
<td>1st</td>
<td>13</td>
</tr>
<tr>
<td>2nd</td>
<td>8</td>
</tr>
<tr>
<td>3rd</td>
<td>16</td>
</tr>
<tr>
<td>4th</td>
<td>5</td>
</tr>
<tr>
<td>5th</td>
<td>1</td>
</tr>
</tbody>
</table>
• Ergonomics guidelines adapted for the school environment
• Good postural habits for children
• Visual considerations for children

• Adapt available school equipment to fit all students

• Teaching tools to teach typing skills and postures
• Teaching tools to teach seated postures

• Ergonomics projects for students
• Case studies from schools
• Furniture selection
<table>
<thead>
<tr>
<th>Instructor</th>
<th>Material</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td>Class room/Computer teacher</td>
<td>Web, video, poster, projects</td>
</tr>
<tr>
<td>Teachers</td>
<td>Computer teacher</td>
<td>Web, video, handout, poster</td>
</tr>
</tbody>
</table>
Pilot Projects and Workshops
Problem - Solving

Eye height
Viewing angle
Neck tilt
Elbow height
Hand position
Back support
Popliteal height
Foot support
- Wood work project
- Home and careers
Web site:

www.open.k12.or.us/cergos/

Case studies
Why?

Is there a need?

How? When? What?

Student, Teacher, Parent Involvement and Ownership

cergos@rochester.rr.com