Survey of Computer Use

Observer’s Manual

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SCU

CREP
Center for Research in Educational Policy
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This manual was designed by Jongpil Cheon
INTRODUCTION

Survey of Computer Use

The Survey of Computer Use (SCU) is designed to collect data regarding student use of computers or digital tools rather than teacher use of these tools. This manual guides observers to identify and code what they observed on student’s computer use in the classroom with a consistent manner.

The procedures of SCU observation are:

1. Receiving formal training of the use of SCU
2. Requesting approval for visiting a school
3. Completing SCU Data Collection Forms for each classroom
4. Completing a SCU Data Summary Form for each school

The SCU Data Collection Forms should be completed for each classroom. Then these forms should be used to complete the SCU Data Summary at the conclusion of the visit. Observers may bring the manual as a reference. Reporting accurate data is an important role of the observer.

The skilled observer is able to improve the accuracy, authenticity, and reliability of observations through intensive training and rigorous preparation.
The Observation Period

- Total number of classrooms typically from 1 to 12 at each school.
- Each classroom is observed for approximately 15 minutes.

Observation Manner

- When entering the classroom, adopt a friendly manner with both the teacher and students. As an observer, you should explain a brief introduction and purpose of your visit to the teacher.

- While in the classroom, try to be unobstructive and remain at a distance (in the back of the room or another area from student focus) so both students and teacher will behave “naturally,” without feeling overly self-conscious about your presence. Comments about observed activities can be quickly noted while you are in the classroom and expanded after leaving and before going to the next classroom.

- You may have unanswered questions at the end of a 15 minute session that are important in accurately recording one or more of the SCU categories. If an appropriate time can be found (e.g., during a break or after school) to speak with teacher without disrupting classroom activities, clarifying questions may be asked.
Basic Data of Observation

At the top of the data collection form, there are spaces you should fill out basic data for each classroom being observed.

- **Time in/Time out**
  The actual time you enter and leave the classroom should be recorded on the in these spaces. If the observation time is abbreviated, the Data Collection Form should indicate how many minutes were actually spent in the room and the reason for the shortened time period.

- **Grade**
  Record the grade level(s) of the students in the class you are observing and the room number.

- **SCU #**
  The SCU # indicates which observation this is in your total visits per school. For example, if this is the third time that you have observed among total ten classrooms at this school, the numbers “3 of 10” should be recorded in the space.

- **Target**
  - Yes – visit was to one prearranged class
  - No – visit involved randomly visiting several classrooms

- **Subject/ Activity Overview**
  It will be helpful you to make note of the subject(s) being taught during the observation. This space should be used for descriptions to help you remember the specific classroom being observed.
## Computer Configuration

### Number of Computers for Student Use

**Question 1**

- Count the number of computers, laptops or digital tools which are available for students in the classroom.
  - None
  - Only 1
  - 2-4
  - 5-10
  - 11 or more

### Computer Age and Capacity

**Question 2**

- Select the capacity of computers for students in the classroom.
- The following features help you figure out the capacity.
  - Up-to-date
    - CD-RW, DVD-ROM and Maybe a Zip drive
    - 1 to 2 years old
  - Aging but adequate
    - Maybe a CD-ROM
    - 3 to 5 years old
  - Out-dated and limited in capacity
    - Over 5 years old

### Computer with Internet Access

**Question 3**

- Ask the teacher if connection to the internet is not easily determined.

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If students do not use computers or digital tools during the observation, Mark “No” in question number 4 and stop the observation.
### Percent of Student Using Computers

**Question 5**

- Record the approximate percentage of students that used computers during the observation.
  - Only a few (less than 10%)
    - 1 to 2 students*
  - Some (about 10–50%)
    - 3 to 12 students*
  - Most (about 51–91%)
    - 13 to 20 students*
  - Nearly All (91–100%)
    - More than 20 students*

*In a class with 25 students

### Students per Computer/Digital Tool

**Question 6**

- Record how frequently students worked at computers or with digital tools.
  - alone
  - in pairs (two students)
  - in small groups (three or more students)

- If students rotate to and from a computer during the observation, record each grouping
  - If at the beginning of the observation computer #1 has one student writing a letter, then has two students creating a presentation, record:
    - “1” for alone
    - “1” for pairs
Rate Student Computer Literacy Skills  

Observe computer literacy skills of students using computer and tally the number of students for each level. 

e.g., locate/open programs, locate/select menu items, save/print documents, etc. 

Rate as not observed if students do not engaged in any of these tasks during the observation. 

Scale 

- Poor 
- Moderate 
- Very good 
- Not observed 

Rate Student Keyboard Skills  

Examine students' the ability to use a keyboard to enter information – 

e.g., ease in locating keys, using shift, space, tab, enter/return, backspace/delete, etc. key. 

Rate as Not observed if students only use the mouse or only use the keyboard in a very limited manner (e.g., entering a password) during the observation. 

Scale 

- Poor 
- Moderate 
- Very good 
- Not observed
Types of Computers and/or Digital Tools

Check all types of computers and/or digital tools that were used during this observation

- Laptop Computers

- Desktop Computers

- Personal Data Assistants (PDA)
Survey of Computer Use

- Graphic Calculator
- Information Processor
- Digital Camera
- Scanner
- Probes
Observations of computer activities, such as frequency and types of computer activity, should be recorded by what is happening at each computer.

Example

- Activity 1 = Production Tool : Presentation [Science]
- Activity 2 = Educational Software : Drill/Practice [Mathematics]

For example, when you record the activity 1, you should mark one in the “Presentation” cell under “Production tools” section. In addition, you should record the number of students involved same activities, the level of meaningfulness, and subject areas.
Types of Computer Tools

- **Production Tools**

- **Word Processing**

  - Any type of activity that has students using a word processor to enter, format, or manipulate information
    - **Enter** = add text, graphics
    - **Edit** = spell check, cut and paste, rewrite sentences
    - **Format** = change font type or style, add tables, tabs, or borders
    - **Manipulate** = sort information, moving text
  
  - **Examples**: MS Word, MS works and Apple Works
  
  - **Non-example**: Entering information in Power Point or Hyper Studio

- **Word Processing Example**

  ![Word Processing Example Image]
Database

Any type of activity that has students using database software to create fields, enter, format, or manipulate information, and/or generate reports

- Create Fields = name and format data fields
- Enter = data into fields
- Format = change font type/style or layout of data fields
- Manipulate = sort information in data fields
- Generate Reports = select and format report data

Examples: MS Access, MS Works, Apple Works

Database Example
Spreadsheet

- Any type of activity that has students using spreadsheet software to enter, format, or manipulate information and/or generate charts.
  - Enter = add row and column headers, cell data and formulas
  - Format = change font type or style, number type, or chart details
  - Manipulate = sort information, perform calculations
  - Generate charts = highlight data and create charts

Examples: MS Excel, MS Works, Apple Works

Spreadsheet Examples (Excel)
Draw/Paint/Graphics

- Any type of activity that has students using draw, paint, or graphics software tools to draw and/or compile digital images
  - Draw = use tools, such as pencil or paint brush, shapes and eraser to create images
  - Compile = add clip art/existing images to create original artwork
- Examples: Ms Office – draw tools, KidPix MS Works and Apple Works Draw/Paint tools

Drawing tool examples
Presentation

- Any type of activity that has students using presentation software to enter, organize, format, and enhance information to be presented to others
  - Enter = add text, graphics
  - Organize = outline, set order of text, graphics, or slides
  - Format = change font, slide type or design
  - Enhance = add sound, transitions, animation
- Examples: MP Express, mPower, MS PowerPoint, MS Works and Apple Works

Presentation tools

Presentation Example (PowerPoint)
Authoring

Any type of activity that has students using authoring software to enter, organize, format, and program information

- Enter = add text, graphics
- Organize = set order of text, graphics, animations, or cards
- Format = change font type or style, card design
- Program = add sound, transitions, animation, functions and/or navigation

Example: HyperStudio

Authoring Examples (HyperStudio)
## Concept Mapping

- Any type of activity that has students using software that enables students to enter, edit, format and organize information into concept maps
  - Enter = add text, shapes and connector lines
  - Edit = spell check, cut and paste, rewrite
  - Format = change font, borders
  - Organize = arrange information into networked map

- Examples: MS Office, MS Works, Apple Works, Inspiration

## Concept Mapping Example (Inspiration)
Planning

Any type of activity that has students using planning software to enter, edit, format, or organize information

- Enter = add text or dates
- Edit = spell check, cut and paste, rewrite
- Format = change font, add organizing features
- Organize = move information

Examples: MS Project

Planning Example (MS Project)
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Internet/Research Tools

Internet Browser

Any type of activity that has students using an Internet Browser to locate, bookmark, and/or retrieve information

- Locate information = use existing search categories or search terms
- Bookmark = create and/or organize bookmarked URLs
- Retrieve information = download or copy information

Examples: Nescape Navigator, MS Internet Explorer

Internet Browser example (Internet Explorer)
CD Reference

- Any type of activity that has students using CD-ROM reference materials to locate and/or retrieve information
  - Locate information = use existing search categories or search terms
  - Retrieve information = download or copy information

- Examples: Britannica, Compton’s, Encarta, Crolier’s, World Book encyclopedia, Time/Life Magazine Archive, National Geographic Maps, 3-D Atlas. Merriam-Webster’s Dictionary
Communications

Any type of activity that has students using communications software to enter, edit, format, and send digitized correspondence:

- Enter = add text, graphics
- Edit = spell check, cut and paste, rewrite sentences
- Format = change font type or style
- Send = message is digitally sent to an individual or list

Examples: Netscape Messenger, Microsoft Outlook.
Educational Software

Drill, Practice & Tutorial

Any type of activity that has students using educational software to review or learn new content or skills
- Tutorials/Guided Practice – presents new information and provides interactive practice and feedback
- Drill and Practice – provides interactive practice and feedback of previously presented information
- Learning Games – provide drill-and-practice in a competitive and motivational nature. Competition can be provided with time constraints, points earned, and/or computer characters.

Examples: Most integrated learning systems for which students log on and complete prescribed lessons, Math Blaster, Smart Start: Hebrew
Problem-Solving

- Any type of activity that has students using educational software to solve problems in simulated environments
  - Problem-solving-present students with situations that require the use of higher-order thinking skills to achieve the intended outcome(s). Many problem-solving programs involve simulations of “real-world” situations and often are game-like.

- Examples: SimEarth, Science Sleuths, Oregon Trail

Process Tools

- Any type of activity that has students using educational software
  - Process Tools-provide students with a set of tools to assist them with completing a designated process such as writing, graphing, or designing.

- Examples: Geometer’s Sketchpad, Author’s Toolkit
Testing Software

Individualized or Tracked Testing

- Students log in to take tests
- Students performance is recorded and stored
- Performance Reports can be generated
- Example: Accelerated Reader

Generic Testing Software

- Student records are not maintained
- Student performance results can typically be printed
Checking Subject Areas

- Check subject area(s) involved with each activity.
- Check none if it was a “free time” activity without an academic focus.
- If an activity is related to more than two subject areas, check all subject areas.
- Examples
  - Production Tools
    If a student begins by wiring a friendly letter, and then switches to a HyperStudio stack on the planets, mark both language arts and science.
  - Internet or a Research Tool
    These activities are often interdisciplinary, so more than one area may be marked.
  - Educational Software
    Most drill and practice software is subject-specific. Some of the problem-solving software may involve more than one subject area.
  - Test Software
    Most testing software is also subject-specific. Very few, if any, will involve more than one subject area.
  - Scale
    - Language arts
    - Mathematics
    - Science
    - Social Studies
    - Other – select if content area is not listed below, e.g., art, foreign language
    - None – select if no subject area is observed, for example if a student is playing a game that is not related to any content area.
### Meaningfulness of the Activities

- Rate each computer activity that was observed
- Computer activity means overall assignment rather than how individual students approach the assignment.
- Example = Two rating would be given for the following class
  - At one computer, two students are collecting internet-based data to place in a spreadsheet.
  - At another computer, one student is reviewing basic math skills by using the district software to complete practice exercises
- Total number of meaningfulness should be same as the number of each computer activity

### Rating scale

- **Low level use of computers:**
  Activities in general required no critical thinking, e.g., used computer applications for copying text or free-time drawing, or used educational software for drill & practice, tutorials, or games.

- **Somewhat meaningful use of computers:**
  Activities in general required very little problem-solving or critical thinking and used computer applications or educational software in a limited manner.

- **Meaningful use of computers:**
  Activities were problem-based, required some critical thinking skills, and some use of computer applications to locate and/or process information or some manipulation of educational software variables to reach solutions.

- **Very meaningful use of computers:**
  Activities were based on meaningful problems, required critical thinking skills, and appropriate use of computer applications to locate and/or process information or manipulation of educational software variables to reach solutions.
Observation Notes

- Provide a brief description of the lesson and what the students were doing while at the computers.

- This description should emphasize the content and educational meaningfulness of the computer activities rather than specific technology-related skills.
After completing your SCU data collection Forms at each school, complete a SCU data summary form. This form is to summarize the information you observed at a school.

**Frequency Rubric**

Use this rubric to rate how often the items in “computer/digital tools” section and “frequency and type of computer activity” section.

- **Not Observed**
  - Never observed during observations
- **Rarely**
  - Observed in only one or two classes
  - Receives isolated use and/or little time in classes
  - Clearly not a prevalent/emphasized component of teaching and learning across classes
- **Occasionally**
  - Observed in some classes
  - Receives minimal or modest time/emphasis
  - Not a prevalent/emphasized component of teaching and learning across classes
- **Frequently**
  - Observed in many but not all classes
  - Receives substantive time or emphasis in classes
  - A prevalent component of teaching and learning across classes
- **Extensively**
  - Observed in most or all classes
  - Receives substantive time and/or emphasis in classes
  - A highly prevalent component of teaching and learning across classes
Appendix A

SCU Data Collection Form
**SURVEY OF COMPUTER USE: DATA COLLECTION FORM**

School __________________________ Observer Name ___________________________________ Time In ____________ Time Out _________

Grade ____________ ID# __________ Observation Date ________________ SCU # ____ of _____ Target YES ____ NO ____

Subject/ Activity Overview _______________________________________________________________________________________________________

Directions:
*Use one sheet for each 15 minutes of observation. Use a pencil to record information. Only mark one response per item, unless noted otherwise.*

<table>
<thead>
<tr>
<th>Computer Configuration</th>
<th>Computer Use</th>
<th>Computers/Digital Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How many computers/laptops/digital tools were <strong>available for student use:</strong></td>
<td>5. During this 15 minute observation, classroom computers/digital tools were used by:</td>
<td>9. Check ALL types of computers and/or digital tools that were used during this observation:</td>
</tr>
<tr>
<td>_____None – if none, skip to Question 4.</td>
<td>_____only a few (less than 10%) students</td>
<td>_____Desktop computers</td>
</tr>
<tr>
<td>_____Only one</td>
<td>_____some (about 10-50%) students</td>
<td>_____Laptop computers</td>
</tr>
<tr>
<td>_____2-4</td>
<td>_____most (about 51-90%) students</td>
<td>_____Personal Digital Assistants (PDA)</td>
</tr>
<tr>
<td>_____5-10</td>
<td>_____nearly all (91-100%) students</td>
<td>_____Graphing Calculator</td>
</tr>
<tr>
<td>_____11 or more</td>
<td></td>
<td>_____Information Processor (e.g., AlphaSmart)</td>
</tr>
<tr>
<td>2. Most of the computers/laptops (not digital tools) were:</td>
<td>6. TALLY the number of times students worked at computers or with digital tools:</td>
<td>_____Digital Accessories (e.g., cameras, scanners, probes)</td>
</tr>
<tr>
<td>_____Up-to-date</td>
<td>_____# alone</td>
<td></td>
</tr>
<tr>
<td>_____Aging but adequate</td>
<td>_____# in pairs</td>
<td></td>
</tr>
<tr>
<td>_____Outdated/limited capacity</td>
<td>_____# in small groups</td>
<td></td>
</tr>
<tr>
<td>_____No computers were available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Most of the computers/laptops (not digital tools) were:</td>
<td>7. TALLY the number of students whose computer literacy skills were:</td>
<td></td>
</tr>
<tr>
<td>_____Connected to the Internet</td>
<td>_____Poor</td>
<td></td>
</tr>
<tr>
<td>_____Not connected to the Internet</td>
<td>_____Moderate</td>
<td></td>
</tr>
<tr>
<td>_____No computers were available</td>
<td>_____Very good</td>
<td></td>
</tr>
<tr>
<td>4. Did <strong>students</strong> use computers or digital tools during the observation?</td>
<td>_____Not observed</td>
<td></td>
</tr>
<tr>
<td>_____Yes</td>
<td></td>
<td></td>
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<tr>
<td>_____No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If No, STOP here. If Yes, please continue with Question 5.</td>
<td>8. TALLY the number of students whose keyboarding skills were:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>_____Poor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>_____Moderate</td>
<td></td>
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<tr>
<td></td>
<td>_____Very good</td>
<td></td>
</tr>
<tr>
<td></td>
<td>_____Not observed</td>
<td></td>
</tr>
</tbody>
</table>

**Observation Notes:** Provide a brief description of the lesson and what the students were doing while at the computers. This description should emphasize the content and educational meaningfulness of the computer activities rather than specific technology-related skills.

_____________________________________________________________________________________________________________________

_____________________________________________________________________________________________________________________

_____________________________________________________________________________________________________________________

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<table>
<thead>
<tr>
<th>Subject Area(s) of the activities</th>
<th>Number of Activities</th>
<th>Number of Students involved in all the activities</th>
<th>Meaningfulness of the activities</th>
<th>PRODUCTION TOOLS</th>
<th>INTERNET/RESEARCH TOOLS</th>
<th>EDUCATIONAL SOFTWARE</th>
<th>TESTING SOFTWARE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language Arts</td>
<td></td>
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<tr>
<td>Mathematics</td>
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<tr>
<td>Science</td>
<td></td>
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<tr>
<td>Social Studies</td>
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</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**COMPUTER TOOLS USED BY STUDENTS**

- **Computer Tools Used by Students**
- **Tally the number of different activities for each tool.**
- **Tally # Students Involved**
- **Total Students Involved**
- **Use tally mark to indicate rating (use rubric* at bottom of page) of each activity included in the “Number of Activities” column.**
- **Check subject area(s) involved with each activity. Check None if it was a “free-time” activity without an academic focus.**

**Sample: Database**

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>III</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PRODUCTION TOOLS**

- **Word Processing**
- **Spreadsheet**
- **Draw/Paint/Graphics**
- **Presentation (e.g., MS PowerPoint™)**
- **Authoring (e.g., HyperStudio™)**
- **Concept Mapping (e.g., Inspiration™)**
- **Planning (e.g., MS Project™)**
- **Other (please describe)**

**INTERNET/RESEARCH TOOLS**

- **Internet Browser (e.g., Netscape™)**
- **CD Reference (e.g., encyclopedias)**
- **Communications (e.g., email, list serves, chat rooms)**
- **Other (please describe)**

**EDUCATIONAL SOFTWARE**

- **Drill/Practice/Tutorial**
- **Problem Solving (e.g., Oregon Trail™, SimCity™)**
- **Process Tools (e.g., Geometer’s Sketchpad™, Author’s Toolkit™)**
- **Other (please describe)**

**TESTING SOFTWARE**

- **Individualized/Tracked (e.g., Accelerated Reader)**
- **Generic**
- **Other (please describe)**

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*RUBRIC for Meaningful Use of Computers*

1. **Low level use of computers**: activities in general required no critical thinking, e.g., used computer applications for copying text or free-time drawing, or used educational software for drill & practice, tutorials, or games.
2. **Somewhat meaningful use of computers**: activities in general required very little problem-solving or critical thinking and used computer applications or educational software in a limited manner.
3. **Meaningful use of computers**: activities were problem-based, required some critical thinking skills, and some use of computer applications to locate and/or process information or some manipulation of educational software variables to reach solutions.
4. **Very meaningful use of computers**: activities were based on meaningful problems, required critical thinking skills, and appropriate use of computer applications to locate and/or process information or manipulation of educational software variables to reach solutions.
Appendix B

SCU Data Summary Form
**Survey of Computer Use (SCU®)**

**Data Summary Form**

<table>
<thead>
<tr>
<th>School ___________________________</th>
<th>Observer Name ___________________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation Date __________________</td>
<td>SCU # ____ of ____ ______________________</td>
</tr>
<tr>
<td>Observer Affiliation __________________</td>
<td></td>
</tr>
</tbody>
</table>

**Directions:** Use information from your SCU Data Collection Forms to complete the following sections. Only mark one response per item, unless noted otherwise.

### COMPUTER CONFIGURATION

1. Classrooms most frequently had the following number of computers or digital tools:
   - [ ] None
   - [ ] One
   - [ ] 2 - 4
   - [ ] 5 - 10
   - [ ] 11 or more

2. Classroom computers were most frequently:
   - [ ] Up-to-date
   - [ ] Outdated/limited capacity
   - [ ] No computers were observed

3. Classroom computers were most frequently:
   - [ ] Connected to the Internet
   - [ ] Not connected to the Internet
   - [ ] No computers were observed

4a. Total number of classrooms visited: ___________________________
4b. Total number of classrooms without students using computers: ___________________________

### COMPUTER USE

5. Classroom computers or digital tools were most frequently used by:
   - [ ] Few (less than 10%) students
   - [ ] Some (about 10-50%) students
   - [ ] Most (about 51-90%) students
   - [ ] Nearly all (91-100%) students
   - [ ] Students did not use computers

6. Students most frequently worked with computers or digital tools:
   - [ ] Alone
   - [ ] In pairs
   - [ ] Group work
   - [ ] Students did not use computers

7. Student computer literacy skills were most frequently:
   - [ ] Poor
   - [ ] Moderate
   - [ ] Very good
   - [ ] Not observed

8. Student keyboarding skills were most frequently:
   - [ ] Poor
   - [ ] Moderate
   - [ ] Very good
   - [ ] Not observed

### FREQUENCY RUBRIC

Use the rubric below to rate how often the items in the following sections were observed.

- **Not Observed**: Never seen during observation
- **Rarely**: Observed in only one or two classes that had students using computers or digital tools
- **Occasionally**: Observed in some classes that had students using computers or digital tools
- **Frequently**: Observed in many classes that had students using computers or digital tools
- **Extensively**: Observed in most or all classes that had students using computers or digital tools

### COMPUTERS/DIGITAL TOOLS

9. Indicate how frequently students used the following computers and/or digital tools

<table>
<thead>
<tr>
<th>Device</th>
<th>Not Observed</th>
<th>Rarely</th>
<th>Occasionally</th>
<th>Frequently</th>
<th>Extensively</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desktop Computers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laptop Computers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal Data Assistants (PDA)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graphing Calculator</td>
<td></td>
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</tr>
<tr>
<td>Information Processor (e.g., Alphaboard)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital Accessories (e.g., camera, scanner, probes)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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D.L. Lawther & S.M. Ross
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Page 1 of 2

The University of Memphis

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FREQUENCY AND TYPE OF COMPUTER ACTIVITY

10. Indicate how frequently students were engaged in the following types of computer activities.

Production Tools Used by Students

<table>
<thead>
<tr>
<th>Activity</th>
<th>Not Observed</th>
<th>Rarely</th>
<th>Occasionally</th>
<th>Frequently</th>
<th>Extensively</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word Processing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Database</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spreadsheet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Draw/Paint/Graphics/Photo-imaging</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presentation (e.g., MS PowerPoint)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Authoring (e.g., HyperStudio)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concept Mapping (e.g., Inspiration)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planning (e.g., MS Project)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (please describe)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Indicate all subject areas involved with the use of Production Tools:
- [ ] Language Arts
- [ ] Mathematics
- [ ] Science
- [ ] Social Studies
- [ ] Other
- [ ] None

Internet/Research Tools Used by Students

<table>
<thead>
<tr>
<th>Tool</th>
<th>Not Observed</th>
<th>Rarely</th>
<th>Occasionally</th>
<th>Frequently</th>
<th>Extensively</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet Browser (e.g., Netscape)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD Reference (encyclopedias, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communications</td>
<td></td>
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</tr>
<tr>
<td>Other (please describe)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Indicate all subject areas involved with the use of Internet/Research Tools:
- [ ] Language Arts
- [ ] Mathematics
- [ ] Science
- [ ] Social Studies
- [ ] Other
- [ ] None

Educational Software Used by Students

<table>
<thead>
<tr>
<th>Software</th>
<th>Not Observed</th>
<th>Rarely</th>
<th>Occasionally</th>
<th>Frequently</th>
<th>Extensively</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drill/Practice/Tutorial</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem Solving (Oregon Trail, SimCity, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process Tools (Geometer's Sketchpad, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (please describe)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Indicate all subject areas involved with the use of Educational Software:
- [ ] Language Arts
- [ ] Mathematics
- [ ] Science
- [ ] Social Studies
- [ ] Other
- [ ] None

Testing Software

<table>
<thead>
<tr>
<th>Software</th>
<th>Not Observed</th>
<th>Rarely</th>
<th>Occasionally</th>
<th>Frequently</th>
<th>Extensively</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individualized/Tracked (e.g., Accelerated Reader)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (please describe)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Indicate all subject areas involved with the use of Testing Software:
- [ ] Language Arts
- [ ] Mathematics
- [ ] Science
- [ ] Social Studies
- [ ] Other
- [ ] None

Overall Meaningful Use of Computers

Directions: Indicate how frequently the following levels of computer activity were observed.

Low level use of computers:
Activities in general required no critical thinking, e.g., used computer applications for copying text or free-time drawing, or used educational software for drill & practice, tutorials, or games.

Somewhat meaningful use of computers:
Activities in general required very little problem-solving or critical thinking and used computer applications or educational software in a limited manner.

Meaningful use of computers:
Activities were problem-based, required some critical thinking skills, and some use of computer applications to locate and/or process information or some manipulation of educational software variables to reach solutions.

Very meaningful use of computers:
Activities were based on meaningful problems, required critical thinking skills, and appropriate use of computer applications to locate and/or process information or manipulation of educational software variables to reach solutions.

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For Review Only

Purposes Only
Appendix C

SCU Practice Activities
### SCU Practice Activities

#### Activity #1

**Directions:** Use the following graphics and information to complete an SCU Data Collection Form.

<table>
<thead>
<tr>
<th>Classroom</th>
<th>Classroom # 1 – 7th Grade- 22 Students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Number and Type of Computer</td>
</tr>
<tr>
<td></td>
<td>• Number of Students per Computer</td>
</tr>
<tr>
<td></td>
<td>• Computer Activity Chart</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time:</th>
<th>10:00-10:10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Type/Activity/Number of Students</td>
<td></td>
</tr>
<tr>
<td>Computer 1</td>
<td>Up-to-Date w/ Internet</td>
</tr>
<tr>
<td>Computer 2</td>
<td>Aging but Adequate</td>
</tr>
<tr>
<td>Computer 3</td>
<td>Outdated/ Limited Capacity</td>
</tr>
<tr>
<td>Computer 4</td>
<td>Outdated/ Limited Capacity</td>
</tr>
</tbody>
</table>

Report on Martin Luther King’s Life

Word Builder Software

<table>
<thead>
<tr>
<th>Time:</th>
<th>10:10-10:15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Type/Activity/Number of Students</td>
<td></td>
</tr>
<tr>
<td>Computer 1</td>
<td>Report on Martin Luther King’s Life</td>
</tr>
<tr>
<td>Computer 2</td>
<td>Word Builder Software</td>
</tr>
<tr>
<td>Computer 3</td>
<td></td>
</tr>
<tr>
<td>Computer 4</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Activity #1 – Continued

**Student Activities**

Use these descriptions to gather information regarding computer literacy and keyboarding skill, computer tools used by students, and the meaningfulness of the computer activity.

**Student 1** - Searches the Internet with ease for resources related to Martin Luther King’s Life. Student uses multiple search engines and types in key search terms.

**Student 2** - Did not use any computer skills except the mouse to select answers in the Word Builder Software. Student practicing vocabulary skills by matching words to definitions.

**Student 3** - Student is easily typing text into a Word Processor program. Student opens Netscape and uses copy and paste functions to insert URL’s in their Martin Luther King report directly from the Internet site. Student knows how to save the report to disk, how to center and change the font size of the title, and how to print a draft copy.

**Student 4** - Student assists Student 3 by suggesting which URL to copy. Student also reads text aloud that should be typed into the paper.

**Student 5** - Did not use any computer skills except the mouse to select answers in Word Builder software. Student practicing vocabulary skills by matching words to definitions.
**SCU Practice Activities**

### Activity #2

**Directions:** Use the following graphics and information to complete an SCU Data Collection Form.

#### Classroom

**Classroom # 2 – 2nd Grade- 26 Students**
- Number and Type of Computer
- Number of Students per Computer
- Computer Activity Chart

#### Time: **8:00-8:10**

<table>
<thead>
<tr>
<th>Computer Type/ Activity/ Number of Students</th>
<th>Computer 1</th>
<th>Computer 2</th>
<th>Computer 3</th>
<th>Computer 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aging but Adequate</td>
<td>Up-to-Date w/ Internet</td>
<td>Outdated/ Limited Capacity</td>
<td>Outdated/ Limited Capacity</td>
</tr>
<tr>
<td>Writing a Science Report</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>E-Mailing questions to a Professor</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reader Rabbit Software</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Time: **8:10-8:15**

<table>
<thead>
<tr>
<th>Computer Type/ Activity/ Number of Students</th>
<th>Computer 1</th>
<th>Computer 2</th>
<th>Computer 3</th>
<th>Computer 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Writing a Science Report</td>
<td></td>
<td>Reader Rabbit Software</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
Student Activities

Use these descriptions to gather information regarding computer literacy and keyboarding skill, computer tools used by students, and the meaningfulness of the computer activity.

Student 1- Students 1 & 2 are working together to write a descriptive paragraph on an endangered species and including reasons why the class should raise money to save the species. Student 1 reads the text to be entered from their handwritten report, but does not use the computer.

Student 2- Types the text slowly while looking for the correct keys.

Student 3- Students 3 & 4 are e-mailing a professor and asking three questions that they generated regarding their endangered species. Student 3 is typing the e-mail easily and using address book features. Student sends the e-mail successfully.

Student 4- Student does not touch the computer but assists Student 3 by saying, “click here” and “enter the address here.”

Student 5- Student is practicing vocabulary skills. Student did not use any computer skills except the mouse to select answers in Reader Rabbit software.
Appendix D

SCU Practice Answer Sheets
**Survey of Computer Use: Data Collection Form**

School: SCU Middle School  
Observer Name: SCU Researcher #1  
Time In: 10:00  
Time Out: 10:15

Grade: 7th  
ID#: 01  
Observation Date: 11/5/04  
SCU #: 1 of 2  
Target: YES  

Subject/Activity Overview: Social Studies Class

### Directions:

Use one sheet for each 15 minutes of observation. Use a pencil to record information. Only mark one response per item, unless noted otherwise.

### Computer Configuration

1. How many computers/laptops/digital tools were **available for student use**:
   - [ ] None – if none, skip to Question 4.
   - [x] Only one
   - [ ] 2-4
   - [ ] 5-10
   - [ ] 11 or more

2. **Most** of the computers/laptops (not digital tools) were:
   - [x] Up-to-date
   - [ ] Aging but adequate
   - [ ] Outdated/limited capacity
   - [ ] No computers were available

3. **Most** of the computers/laptops (not digital tools) were:
   - [x] Connected to the Internet
   - [ ] Not connected to the Internet
   - [ ] No computers were available

4. Did **students** use computers or digital tools during the observation?
   - [x] Yes
   - [ ] No

   If No, STOP here. If Yes, please continue with Question 5.

### Computer Use

5. During this 15 minute observation, classroom computers/digital tools were used by:
   - [x] only a few (less than 10%) students
   - [ ] some (about 10-50%) students
   - [ ] most (about 51-90%) students
   - [ ] nearly all (91-100%) students

6. **TALLY** the number of times students worked at computers or with digital tools:
   - [ ] # alone
   - [ ] # in pairs
   - [ ] # in small groups

7. **TALLY** the number of students whose computer literacy skills were:
   - [ ] Poor
   - [ ] Moderate
   - [x] Very good
   - [ ] Not observed

8. **TALLY** the number of students whose keyboarding skills were:
   - [ ] Poor
   - [ ] Moderate
   - [x] Very good
   - [ ] Not observed

### Computers/Digital Tools

9. Check ALL types of computers and/or digital tools that were used during this observation:
   - [x] Desktop computers
   - [ ] Laptop computers
   - [ ] Personal Digital Assistants (PDA)
   - [ ] Graphing Calculator
   - [ ] Information Processor (e.g., AlphaSmart)
   - [ ] Digital Accessories (e.g., cameras, scanners, probes)

### Observation Notes:

Provide a brief description of the lesson and what the students were doing while at the computers. This description should emphasize the content and educational meaningfulness of the computer activities rather than specific technology-related skills.

One student is typing a report on MLK’s role in the Civil Rights movement. Another student gathers information from multiple websites. This activity required the student to sort through and identify the most important information. Students using word builder software are matching words to definitions.
### COMPUTER TOOLS USED BY STUDENTS

<table>
<thead>
<tr>
<th>Subject Area(s) of the activities</th>
<th>Meaningfulness of the activities</th>
<th>Number of Activities</th>
<th>Number of Students involved in all the activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language Arts</td>
<td>Mathematics</td>
<td>Science</td>
<td>Social Studies</td>
</tr>
</tbody>
</table>

#### Sample: Database

<table>
<thead>
<tr>
<th>Number of Activities</th>
<th>Tally the number of different activities for each tool.</th>
<th>Tally # Students Involved</th>
<th>Total Students Involved</th>
<th>1 Low level use of computers</th>
<th>2 Somewhat meaningful use of computers</th>
<th>3 Meaningful use of computers</th>
<th>4 Very meaningful use of computers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample: Database</td>
<td>3</td>
<td>7</td>
<td>I</td>
<td>I</td>
<td>II</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

#### PRODUCTION TOOLS

<table>
<thead>
<tr>
<th>Tool</th>
<th>Number of Activities</th>
<th>Tally # Students Involved</th>
<th>Total Students Involved</th>
<th>1 Low level use of computers</th>
<th>2 Somewhat meaningful use of computers</th>
<th>3 Meaningful use of computers</th>
<th>4 Very meaningful use of computers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word Processing</td>
<td>2 (MLK Report)</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Database</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spreadsheet</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Draw/Paint/Graphics</td>
<td></td>
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</tr>
<tr>
<td>Presentation (e.g., MS PowerPoint™)</td>
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<tr>
<td>Authoring (e.g., HyperStudio™)</td>
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<tr>
<td>Concept Mapping (e.g., Inspiration™)</td>
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<td></td>
</tr>
<tr>
<td>Planning (e.g., MS Project™)</td>
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<tr>
<td>Other (please describe)</td>
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</tr>
</tbody>
</table>

#### INTERNET/RESEARCH TOOLS

<table>
<thead>
<tr>
<th>Tool</th>
<th>Number of Activities</th>
<th>Tally # Students Involved</th>
<th>Total Students Involved</th>
<th>1 Low level use of computers</th>
<th>2 Somewhat meaningful use of computers</th>
<th>3 Meaningful use of computers</th>
<th>4 Very meaningful use of computers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet Browser (e.g., Netscape™)</td>
<td>3 (MLK Search)</td>
<td>II</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>CD Reference (e.g., encyclopedias)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communications (e.g., email list serves, chat rooms)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Other (please describe)</td>
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</tr>
</tbody>
</table>

#### EDUCATIONAL SOFTWARE

<table>
<thead>
<tr>
<th>Tool</th>
<th>Number of Activities</th>
<th>Tally # Students Involved</th>
<th>Total Students Involved</th>
<th>1 Low level use of computers</th>
<th>2 Somewhat meaningful use of computers</th>
<th>3 Meaningful use of computers</th>
<th>4 Very meaningful use of computers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drill/Practice/Tutorial</td>
<td>2 (word builder)</td>
<td>II</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Problem Solving (e.g., Oregon Trail™, SimCity™)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process Tools (e.g., Geometer’s Sketchpad™, Author’s Toolkit™)</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Other (please describe)</td>
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</tr>
</tbody>
</table>

#### TESTING SOFTWARE

<table>
<thead>
<tr>
<th>Tool</th>
<th>Number of Activities</th>
<th>Tally # Students Involved</th>
<th>Total Students Involved</th>
<th>1 Low level use of computers</th>
<th>2 Somewhat meaningful use of computers</th>
<th>3 Meaningful use of computers</th>
<th>4 Very meaningful use of computers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individualized/Tracked (e.g., Accelerated Reader)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generic</td>
<td></td>
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<tr>
<td>Other (please describe)</td>
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</tr>
</tbody>
</table>

### RUBRIC for Meaningful Use of Computers

1. Low level use of computers: activities in general required no critical thinking, e.g., used computer applications for copying text or free-time drawing, or used educational software for drill & practice, tutorials, or games.
2. Somewhat meaningful use of computers: activities in general required very little problem-solving or critical thinking and used computer applications or educational software in a limited manner.
3. Meaningful use of computers: activities were problem-based, required some critical thinking skills, and some use of computer applications to locate and/or process information or some manipulation of educational software variables to reach solutions.
4. Very meaningful use of computers: activities were based on meaningful problems, required critical thinking skills, and appropriate use of computer applications to locate and/or process information or manipulation of educational software variables to reach solutions.
### Survey of Computer Use: Data Collection Form

**School:** SCU Elementary  
**Observer Name:** SCU Researcher #1  
**Time In:** 8:00  
**Time Out:** 8:15  
**Grade:** 2nd  
**ID#:**  
**Observation Date:** 11/5/04  
**SCU #** 2 of 2  
**Target:** YES, NO  
**Subject/Activity Overview:** Science Class

**Directions:** Use one sheet for each 15 minutes of observation. Use a pencil to record information. Only mark one response per item, unless noted otherwise.

#### Computer Configuration

1. How many computers/laptops/digital tools were available for student use:  
   - None – if none, skip to Question 4.  
   - Only one  
   - 2-4  
   - 5-10  
   - 11 or more  

2. Most of the computers/laptops (not digital tools) were:  
   - Up-to-date  
   - Aging but adequate  
   - Outdated/limited capacity  
   - No computers were available  

3. Most of the computers/laptops (not digital tools) were:  
   - Connected to the Internet  
   - Not connected to the Internet  
   - No computers were available

4. Did students use computers or digital tools during the observation?  
   - Yes  
   - No

If No, STOP here. If Yes, please continue with Question 5.

#### Computer Use

5. During this 15 minute observation, classroom computers/digital tools were used by:  
   - Only a few (less than 10%) students  
   - Some (about 10-50%) students  
   - Most (about 51-90%) students  
   - Nearly all (91-100%) students

6. TALLY the number of times students worked at computers or with digital tools:  
   - # alone  
   - # in pairs  
   - # in small groups

7. TALLY the number of students whose computer literacy skills were:  
   - Poor  
   - Moderate  
   - Very good  
   - Not observed

8. TALLY the number of students whose keyboarding skills were:  
   - Poor  
   - Moderate  
   - Very good  
   - Not observed

9. Check ALL types of computers and/or digital tools that were used during this observation:  
   - Desktop computers  
   - Laptop computers  
   - Personal Digital Assistants (PDA)  
   - Graphing Calculator  
   - Information Processor (e.g., AlphaSmart)  
   - Digital Accessories (e.g., cameras, scanners, probes)

**Observation Notes:** Provide a brief description of the lesson and what the students were doing while at the computers. This description should emphasize the content and educational meaningfulness of the computer activities rather than specific technology-related skills.

The students send an email to a professor. Students are asking the professor questions about endangered species. Questions were generated by the students. Two students typing a report about their endangered species. The first student reads the text out loud, while the second student types the text slowly. Student struggles to find each key. One student using Reader Rabbit software to practice vocabulary skills.
<table>
<thead>
<tr>
<th>COMPUTER TOOLS USED BY STUDENTS</th>
<th>Number of Activities</th>
<th>Number of Students involved in all the activities</th>
<th>Meaningfulness of the activities</th>
<th>Subject Area(s) of the activities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tally the number of different activities for each tool.</td>
<td>Tally # Students Involved</td>
<td>Total Students Involved</td>
<td>Use tally mark to indicate rating (use rubric* at bottom of page) of each activity included in the “Number of Activities” column.</td>
</tr>
<tr>
<td></td>
<td>Sample: Database</td>
<td>III</td>
<td>784.</td>
<td>7</td>
</tr>
<tr>
<td>PRODUCTION TOOLS</td>
<td></td>
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<tr>
<td>Word Processing</td>
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<td>Database</td>
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<tr>
<td>Spreadsheet</td>
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<tr>
<td>Draw/Paint/Graphics</td>
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<tr>
<td>Presentation (e.g., MS PowerPoint™)</td>
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<tr>
<td>Authoring (e.g., HyperStudio™)</td>
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<tr>
<td>Concept Mapping (e.g., Inspiration™)</td>
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<tr>
<td>Planning (e.g., MS Project™)</td>
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<tr>
<td>Other (please describe)</td>
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<tr>
<td>INTERNET/RESEARCH TOOLS</td>
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<tr>
<td>Internet Browser (e.g., Netscape™)</td>
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<td>CD Reference (e.g., encyclopedias)</td>
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<td>Communications (e.g., email lists, chat rooms)</td>
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<tr>
<td>Other (please describe)</td>
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<tr>
<td>EDUCATIONAL SOFTWARE</td>
<td></td>
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<tr>
<td>Drill/Practice/Tutorial</td>
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<tr>
<td>Problem Solving (e.g., Oregon Trail™, SimCity™)</td>
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<tr>
<td>Process Tools (e.g., Geometer's Sketchpad™, Author's Toolkit™)</td>
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<tr>
<td>Other (please describe)</td>
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<tr>
<td>TESTING SOFTWARE</td>
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<td>Individualized/Tracked (e.g., Accelerated Reader)</td>
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<td>Generic</td>
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<tr>
<td>Other (please describe)</td>
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</tbody>
</table>

*RUBRIC for Meaningful Use of Computers

1. **Low level use of computers**: activities in general required no critical thinking, e.g., used computer applications for copying text or free-time drawing, or used educational software for drill & practice, tutorials, or games.
2. **Somewhat meaningful use of computers**: activities in general required very little problem-solving or critical thinking and used computer applications or educational software in a limited manner.
3. **Meaningful use of computers**: activities were problem-based, required some critical thinking skills, and some use of computer applications to locate and/or process information or some manipulation of educational software variables to reach solutions.
4. **Very meaningful use of computers**: activities were based on meaningful problems, required critical thinking skills, and appropriate use of computer applications to locate and/or process information or manipulation of educational software variables to reach solutions.

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