

User Definition and Requirements  
Keyboarding for Kindergarten  
(Key Seekers - possible branding name)

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# Project Overview

The Cobb County School District is looking to integrate the introduction of computer keyboarding to kindergarten children while learning basic language art skills. This proposed interactive instructional keyboarding project will be used in cooperation with other language arts activities to strengthen the children's ability to create and communicate. The computer activity and correlating print materials will be created to meet the needs of the District, the children, parents and teachers.

**Primary Goal for Kindergarten Keyboarding:**

**The student should be able to recognize the letters of the alphabet on the keyboard and use the correct hand to strike the key.**

**Secondary Goal for Kindergarten Keyboarding:**

**Incorporate elements of literacy expectations into the program to make the experience more meaningful for the learner.**

Most typing or keyboarding applications are not integrated until first or even third grade. Currently, there is no existing computer application that meets the needs and skill level of kindergarten children.

## Requirements

This document will examine the vast requirements necessary for the project to be created successfully. Studying the requirements necessary will alert the developer, designer and content providers of potential problem areas as well as address the many different areas of discipline involved in creating such a project.

### Cobb County School District Requirements

The following sources were used for reference to identify technical, design and user requirements.

Cobb County Web Page Publishing and Compliance Guidelines

[http://www.cobbk12.org/~pope/acceptable\\_use\\_policy.pdf](http://www.cobbk12.org/~pope/acceptable_use_policy.pdf)

Kindergarten Cobb County School District Criteria/Curriculum—Language arts

<http://www.cobbk12.org/~schoolimprovement/curriculum/langarts/kinder.htm>

Kindergarten Cobb County School District - Technology

<http://picasso.cobbk12.org/cobbcurriculum/curriculum/ParTIGrKCR005688.HTM>

## Technical Requirements

- Cobb County elementary schools are primarily PC, standardized on IE- versions in use vary widely, but no older than Win '98.
- There are several elementary schools on Mac OS 9 & X. Browser again is IE standard on OS 9, with Safari in broad use in X, but standardized on IE.
- It is unclear at this time if the Cobb County School District will host the Key Seekers application on its server or if the application will be stand alone.

### **MINIMUM Requirements for stand alone application:**

- Windows 98/Me/NT/20000

- ❏ Pentium II 266mhz processor
- ❏ 4x CD-ROM drive
- ❏ 64 MB RAM
- ❏ ?? MB available on hard drive
- ❏ Monitor with a minimum 800 x 600 resolution and 16 bit color
- ❏ Sound Card
- MACINTOSH
  - ❏ G3 266 mhz processor
  - ❏ 4X CD-ROM drive
  - ❏ 80MB Free RAM
  - ❏ ??MB available on hard drive
  - ❏ System 9 or Higher
- Flash and XML enabled (version 8)
- Flash Player (version 8)
- Headset is recommended

## Design Requirements

- The design will be clean, crisp and inviting.
- Age appropriate illustrations to denote the approved word list (needs to be created)
- Instructions will be audible on interactive pages.
- Animations as "reward"
- Resolution to design for is 800 x 600
- Primary colors will play an important role for instructions and attention.

## User Requirements

- How to load the program
- How to end the program.
- Hit the right key for the desired response
- Know colors
- Know or learn left and right
- Motivation to continue using software

## User Description and Goals

### Primary Users

**Key Goal: Use the correct hand to type the correct letter (“reward” is animation)**

- Kindergarten Students

### Secondary Users

**Key Goal: To assist the kindergarten student to achieve language art skills and keyboarding skills**

- Kindergarten Teacher
- Kindergarten Parent

### Complementary Users

**Key Goal: What can we provide to our students, teachers, parents to increase technical skills and language arts**

- Integrated Instructional Technology Specialist
- Curriculum Researchers
- Cobb County School District

## User Task Matrix

The purpose of this matrix is to help the client visualize who will use the application and the manner in which the application will be used most often.

Key Seekers Application	Primary Users	Secondary Users		Complementary		
	Kindergarten Students	Kindergarten Teachers	Kindergarten Parents	Developers	Market Research	Cobb County School District Curriculum
start the program	x	x	x	x	x	x
end the program	x	x	x	x	x	x
match a letter on the keyboard to an illustration or a letter on the screen	x					
advance the program to the next word or level	x					
Option to turn sound on and off	x	x	x			
left hand right hand clues and encouragement	x					

## Personas:

Personas are a way to personalize the users of a site. The personas created in this document were created using research referenced in the Additional Supporting Research section of this document.

If we keep our approach personal, we are more likely to meet the needs of the user.

### Primary User: The Kindergarten Student

#### Susan Johnson Personal Profile

Quote:

“My favorite things are ice cream and my dog.”



Susan has recently entered kindergarten at Brown Elementary School in Cobb County, Georgia. She spends ½ day at school and enjoys being with her new friends. She especially likes puzzles and games. She is new to sharing as she is an only child.

She enjoys school and always talks about her dog named Bunny.

#### Background:

- 5 years old
- Attend Brown Elementary School Cobb County
- Concerned what other kids think

#### Attributes:

- Outgoing
- Physically active
- Concerned with the friends and having fun

#### Needs:

- Simple navigation and instruction
- Motivation
- Stimulation to activity
- Attention
- Learn Letters, recognize and by sight sound

<b>Kindergarten Student Scenario</b>	<b>Needs</b>	<b>Feature</b>	<b>Behavior</b>
<p>Sue is given a choice of activities in kindergarten at one of the many learning centers. She chooses the computer and chooses to “play” with Key Seekers.</p> <p>There may be times when she needs to share the experience with another student as the computer stations are limited.</p> <p>She and a few friends take turns and sometimes work as a group to obtain proper hand use and correct letter recognition.</p>	<p>to start program</p> <p>to hear instructions</p> <p>to be reminded which hand to use</p> <p>match letter with picture and or sound</p> <p>Encouragement</p> <p>Feedback</p>	<p>Large buttons to start program</p> <p>Sound on or Off Option (headset)</p> <p>Audio/Visual cues of hands use.</p> <p>Color matching to find correct key and use correct hand</p> <p>Audio and Visual encouragement – correct answers will display “fun” meaningful animation correlated to the illustration displayed.</p> <p>Adult Supervision</p> <p>Audio and Visual feedback for correct and incorrect answers</p> <p>Adult Supervision</p>	<p>She places the disc in the drive or logs on to the site using a desktop shortcut. She is greeted with a colorful screen and listens to the instructions. She is prompted to start with audio and visual highlight of a large GO button.</p> <p>She proceeds through the “game” matching pictures with letters and matching her left hand letters with the left hand letters of the keyboard. She has trouble with left and right so colored tape is placed on the corresponding hands to help remind her where to find the letter on the key board and what hand to use to press the letters.</p>

## Secondary User: The Kindergarten Teacher

### **Barbara Lee** **Personal Profile**

Quote:

“Stay focused on the task, persevere, and you will succeed.”



Barbara is committed to her life as an early childhood educator. She spends much of her free time researching new and effective ways to make a difference in the learning environment for her kindergarten class.

She is relatively familiar with computer usage and feels comfortable incorporating it into the classroom. She is very picky about the quality time kids spend on the computer as the class time is limited. She is looking for software that meets the needs of her students and kindergarten literacy expectations.

Barbara is researching schools for her Masters Degree in education.

### **Background:**

- 28 years old
- Teaching Kindergarten for 3 years
- Single
- Enjoys reading, board games, gardening
- Dreams of learning to salsa dance
- Uses the internet and email to communicate with family and friends and research.

### **Attributes:**

- Caring
- Positive attitude
- Task oriented and studious
- Extremely well organized
- Dedicated to children's success

### **Needs:**

- Additional Support for language arts teaching
- New ways to incorporate computer into early learning environment

<b>Kindergarten Teacher Scenario</b>	<b>Needs</b>	<b>Feature</b>	<b>Behavior</b>
<p>Barbara allows her students 20 – 30 minutes twice a week to choose computer time as an optional activity.</p> <p>She is limited in the amount of supervision she can provide to the students and encourages them to work together at the computers.</p> <p>She sees that three children have chosen to use the computers. There are two available for the students in the classroom.</p>	<p>Software that the children can operate with minimal supervision</p> <p>Incorporate group use when there are not enough computers</p> <p>offer additional activities to support the keyboard project</p>	<p>Audio/Visual instructions</p> <p>Turn taking or children who know left right to help remind and encourage children just learning the concept.</p> <p>Children can speak the word displayed, say the color and the left-right hand that should be used.</p> <p>Supporting Materials that have the same look and feel as the interactive project (These are still being discussed)</p>	<p>She will assist the children in getting situated. She will supervise the loading of the program to be certain the child does understand what to do and how to do it.</p> <p>She will describe to the other children ways they can cooperate in the use of the game. Or redirect some children to other supportive activities (possible low tech key boards where they can play along)</p> <p>She may use class time as a group to play a low tech version of the software using flashcards and a large keyboard layout. These materials will have the same look and feel as the interactive program. (still being designed and discussed)</p>

## Complimentary User: Integration Technology Specialist

### **Robert Wells**

#### **Personal Profile**

Quote:

“Delegation is an art, a science, a gift and a necessary evil.”



Robert has always been dedicated to education. He possesses an undergraduate degree in history. Years ago he taught history in a public high school. Later in life he became very interested in computer programming. He returned to school for his Masters Degree in Instructional Technology. After completing his degree he was able to secure a position with the Cobb County School District.

#### **Background:**

- 53 years old, married man with 2 children
- Coaches a little league team
- Very tech savvy
- Dedicated to the education of children

#### **Attributes:**

- Manages People Well
- Master at time management
- Delegates task he does not do well
- Efficient and friendly
- Patient

#### **Needs:**

- Information about appropriate software that can be incorporated into existing curriculum.
- Software and curriculum ideas that are easily implemented for both parents and students and teachers
- Will the software meet all necessary requirements for the Cobb County District
- Will the software meet the standards of the existing equipment.

<b>Integration Technology Specialist Scenario</b>	<b>Needs</b>	<b>Feature</b>	<b>Behavior</b>
<p>Among his many tasks with the Cobb County School District, Robert has been asked to create or find appropriate software for incorporating keyboarding into the kindergarten.</p>	<p>Program that will meet the developmental level for the children. Possible additional activities to support language skills. An application that requires some supervision but can be easily implemented by parents and teachers.</p>	<p>Robert will briefly review all features</p>	<p>Robert will load the program and give it a once over review keeping in mind the needs of the school district, children parents and teachers. He will assess whether the program will meet the existing requirements for the equipment available.</p> <p>He will also send the program to the appropriate teachers for their review and acceptance before implementing the program into the schools.</p>

# Additional Supporting Research

## Childhood Development

### Five Year Olds

- Can copy simple geometric patterns.
- Can count ten or more objects
- Beginning to learn how to print letters
- Understand the difference between fantasy and reality
- Have the ability to remember parts of stories
- Are concerned with pleasing their friends

[National Network for Childcare – Child Development](http://www.nncc.org/Child.Dev/child.dev.page.html)

<http://www.nncc.org/Child.Dev/child.dev.page.html>

[Children and Computers](http://www.ericeece.org/pubs/digests/2000/haugland00.html)

<http://www.ericeece.org/pubs/digests/2000/haugland00.html>

Children this age are developmentally within Piaget's preoperational stage. This means they are concrete learners who are very interested in using newly learned symbolic representation - speaking, writing, drawing (including maps and geometric figures) and using numbers. Further, children this age are extremely active and mobile. They often have difficulty sitting still; they need frequent changes in learning modalities; and they want a variety of physical experiences involving dance, physical play, climbing and sports. Preoperational children are also continuing their mastery of language, and exploring various facets of social behavior.

[The Role of Technology in Early Childhood Programs](http://www.earlychildhood.com/Articles/index.cfm?A=302&FuseAction=Article)

[Francis Wardle, Ph.D.](http://www.earlychildhood.com/Articles/index.cfm?A=302&FuseAction=Article)

<http://www.earlychildhood.com/Articles/index.cfm?A=302&FuseAction=Article>

## Software Design

When children are passive, there is no way to gauge whether or not they understand the concept presented. When software is designed to facilitate active use, children are able to accomplish goals. Comprehension, not memorization is stressed.

<http://www.naeyc.org/resources/eyly/1996/09b.htm>

Software designed for children ages 3 – 6 should...

- ❏ Be easy to control (minimal mouse and keyboard usage)
- ❏ Use menus one level deep. The menus should be represented visually.
- ❏ Use sound and color to make the program interesting, but not overly stimulating.
- ❏ Be age appropriate and accommodate a range of skills.

<http://www2.edc.org/NCIP/library/ec/Char.htm>

### Instructions

- ❏ Characters should speak the instructions should be verbal. Children will pay more attention to this than they will to audio alone.
- ❏ Children should be able to repeatedly play instructions.
- ❏ Animate or highlight characters while they are speaking to draw the children's attention.

### Characters and animations

- ❏ Characters should not speak at the same time as one another.
- ❏ Characters should not be constantly in motion.
- ❏ Always allow children to terminate animations.

<http://www.research.microsoft.com/users/marycz/druin98.htm>

Children, between the ages of 4 and 5 use a computer independently for up to half an hour. If the child is having fun, the child will use the computer for a longer period of time.

Software should be patterned according to the child's daily activities.

<http://www.smartcomputing.com/editorial/article.asp?article=articles%2F1994%2Fsept94%2Fpcn0912%2Fpcn0912%2Easp>

## The Haugland Developmental Software Scale

This scale consists of ten categories. Each of the categories contains a set of sub-criteria. The following is a summary of the scale. A detailed diagram containing all of the sub-categories is available at: <http://www.childrenandcomputers.com/Evaluations/software/software-scale.htm>.

Age Appropriateness:	The concepts presented must be appropriate for the age group in question. The method of presentation should meet the children's developmental needs, the children should not have to adapt to the software. The software should support varying developmental levels.
Child in Control:	The children should have the ability to control the pace and the flow of the process. The software should provide children with an obvious method of returning to the main menu. Visual and verbal prompting should be used to aid the child in navigation. The software should support discovery through trial and error.
Clear Instructions:	Verbal instructions are helpful even to children who read. Directions should be clear and exact. Short phrases should be used. The software should always give children a clear indication of where to go next. Visual prompts are useful. A help option should be provided. Pictures and well-designed icons should be used to help children decide between choices.
Expanding Complexity:	The entry point of the software must be simple and easy to entice the child to explore further. Once the child is enticed the software should present important ideas and concepts.
Independence:	After initial guidance, children should be able to operate the software essentially on their own. This does not mean that adult interaction cannot be used to enrich the experience.
Non-violence:	The software should not contain violent scenes, objects, or activities. This is especially important on software, where unlike with television, children are more than passive observers. If violent acts must occur, their permanence should be stressed, do not allow children to undo explosions etc. The software should emphasize positive social values.
Process Orientation:	Intrinsic motivation, not a reward structure, should be used to create enthusiasm. The desire to explore, experiment, discover, and learn should be their own reward.
Real World Model:	The software should use concrete representations of real world objects. Scale and color should be realistic, not stereotypical. Information should be accurate since children believe, without questioning, that much of what they are presented with is true.
Technical features:	The website should be colorful and uncluttered. Clutter makes it difficult for children to focus. Whenever possible, let children control the animation. Realistic sound effects and music are helpful. Consistency is crucial. Actions should produce reasonable results. Printing should be possible. Printouts provide children with tangible results. The software should run quickly. Children should be actively involved. The software should allow children to save and restore .
Transformations:	The software should stress the impact of the child's interaction overtime.

Summary of key points:

- ❏ Children should control process flow and pacing.
- ❏ Visual and verbal prompting should be used to aid the child in navigation.
- ❏ The software should always give children a clear indication of where to go next.
- ❏ Pictures and well-designed icons should be used to help children decide between choices.
- ❏ The entry point of the software must be simple and easy to entice the child to explore further. Once the child is enticed the software should present important ideas and concepts.
- ❏ After initial guidance, children should be able to operate the software essentially on their own.
- ❏ Intrinsic motivation, not a reward structure, should be used to create enthusiasm.
- ❏ The software should use concrete representations of real world objects. Scale and color should be realistic, not stereotypical.
- ❏ The website should be colorful and uncluttered.
- ❏ Whenever possible, let children control the animation
- ❏ Printing should be possible.
- ❏ The software should allow children to save and restore
- ❏ The software should stress the impact of the child's interaction overtime.

[http://www.childrenandcomputers.com/Articles/selecting\\_developmentally\\_approp.htm](http://www.childrenandcomputers.com/Articles/selecting_developmentally_approp.htm)

## Parental Involvement

Share with parents that setting limits and managing media time is essential. Too much "screen time" (computer, TV, videogame and video) can lead to increased distractibility and difficulty attending to extended activities. A good recommendation is one hour per day of total screen time for preschoolers, and two hours for elementary school children.

<http://www.netc.org/earlyconnections/kindergarten/curriculum.html>

Parents want to control volume.

Parents want their children to develop computer literacy.

Children have a tendency to skip difficult tasks and remain at easy levels. Parental involvement can mediate this issue.

<http://www.naeyc.org/resources/eyly/1996/09b.htm>

## Technology and Curriculum

In kindergarten children and teachers are working on readiness skills and early literacy experiences. Even in kindergarten children may benefit from technology if care is taken that computer (and other technology) use does not replace time spent on important foundation skills. When used properly, computers and other technology can help children learn, both in short, simple lessons and as an integral part of larger, more complex, projects. Including technology as a part of classroom activities can motivate students and allow them to learn and share their understanding in a variety of ways.

Children receive the greatest benefits from technology in the classroom when:

- ❑ The lesson or project is directly connected to the classroom curriculum
- ❑ The technology allows for active learning and discovery
- ❑ The lesson or project is open-ended, allowing learners to proceed at their own pace
- ❑ Technology is applied to real situations for a real purpose
- ❑ Computers are part of classroom activities, rather than set apart in a separate room or lab

<http://www.netc.org/earlyconnections/kindergarten/curriculum.html>

## Dos and Don'ts of Using Computers in Early Childhood Programs

- Provide a computer center as one of many equally valued learning centers in the classroom. Allow use, access, and choices as you would any other center.
- Do not use time on the computers as a reward for other activities, behaviors, and task completion. Do not only allow the 'well behaving' children to access the computers.
- Allow children lots of time to explore how to use a computer: what can/cannot occur, and simple exploration of the medium.
- Do not sacrifice resources for important basics such as art materials, blocks, books, play dough, puzzles, water tables, outdoor playground equipment, to purchase and maintain computers.
- Do carefully evaluate all software, both for developmental appropriateness, and for nonsexist, nonracist, nonstereotypical, and nonviolent material. Of the software evaluated by Haugland (2000), only 25% of the titles reviewed were considered acceptable. Use the Haugland Developmental Software Scale to evaluate software. (Haugland, 1997)
- Do not use computer labs. Public schools seem to love computer labs, but, by definition, it is simply impossible to integrate the ongoing classroom curricula if computers are isolated in a lab, where children must attend at a specific time during the day.
- Provide enough staff training that teachers feel comfortable both with the computers in the classroom, and the software selected (NAEYC, 1996).
- Do not use software that reinforces gender/racial stereotypes, or that promotes violence as an acceptable way to solve problems. This includes computer games.

- Do not allow computer use to distract children's time and attention from critical early childhood activities: art, music, play, social interaction, exploration of books, climbing on the playground, etc. Computers cannot replicate concrete experiences, hands on learning, mentoring by adults and older peers, and exploration of the real physical and natural world.
- Make sure needed training and support for computers in the program does not detract from other needed training and support, such as working with children with special need, literacy instruction, conflict resolution, etc.

[The Role of Technology in Early Childhood Programs by Francis Wardle, Ph.D.  
http://www.earlychildhood.com/Articles/index.cfm?A=302&FuseAction=Article](http://www.earlychildhood.com/Articles/index.cfm?A=302&FuseAction=Article)