Texas Focus: Learning From Near to Far

Carolina assistive Technology (CAT) Computer Games for Students with Visual Impairments

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The University of North Carolina has created a number of FREE computer games for students with visual impairments. These games are all designed to be FUN and to teach specific skills that are unique to students with visual impairments. Hark the Sound games were initially created so that kindergarten students would have accessible games to play (along side their sighted peers) during computer lab. Dr. Gary Bishop (computer science professor), his UNC students, and Diane Brauner (Orientation and Mobility Specialist) have been collaborating and creating assistive technology games for the past seven years. These games can be downloaded at no charge from Dr. Bishop’s website: http://wwwx.cs.unc.edu/~gb/wp/research/.

**RELEASED CAROLINA ASSISTIVE TECHNOLOGY (CAT) COMPUTER GAMES:**

**Hark the Sound** is a collection (20+ games and growing!) of sound-based games for young kids (preschoolers and up) who are visually impaired or blind. Hark games are simple – using only the arrow keys and escape key. There are naming games, category games and pad games. The pad games require a Dance Dance Revolution mat and adaptor. Hark is designed so that teachers can easily create new games or modify games that are already available. (See page 4 for more information about Hark the Sound.)

**SamiSays** is another fun game that promotes creative writing. Students can record themselves and they can insert interesting sounds into their stories. Teachers also have the option of choosing specific sound prompts for students to use in their stories. Teachers can create their own stories with comprehension questions -the student records his answer after each question. SamiSays uses the same arrow keys/commands
as Hark the Sound plus a few additional keys. Like Hark the Sound, SamiSays is designed for young students (preschoolers and up).

**SonicZoom** is an exciting car racing game that is fun for everyone! Students try to collect coins that are on the road. Each coin emits a different tone (left lane is a low tone, middle lane is middle tone and right lane is high tone). Students use the arrow keys to move between the three lanes. Students earn points at each level; the harder levels have obstacles that have to be avoided (three menacing tones). SonicZoom teaches sound localization and how to move horizontally (left, middle, and right) across the computer screen. SonicZoom is geared for middle and high school students; although elementary students enjoy the easier levels.

**The Last Crusade** is a sound-based role-playing game. It comes with a map maker so that students can make their own games. Last Crusade is geared for middle and high school students; however, many elementary students also enjoy playing.

**Descent into Madness** is another sound-based role-playing game. Players wake up in a virtual world with a twisted, mad doctor. Descent into Madness is geared for middle and high school students (story content may be frightening to young students).

**BATS** is a program that displays maps with 3D sound, text-to-speech, sound icons, and tactile display. (Bats is a wonderful program, but is too complex for most high school students with visual impairments. BATS works best with a haptic device.)

**GAMES UNDER CONSTRUCTION - CAROLINA ASSISTIVE TECHNOLOGY (CAT) COMPUTER GAMES:**

University of North Carolina computer science students create these accessible games as part of their course work. Most games are too complex to be created, field tested, and revised within one semester. Students taking the assistive technology class the following year, often want to create their own new game, rather than completing one of these
games. Funding is needed in order to fine-tune these incredible games so that they can be released nationally.

We have discovered that the more complex games (such as BATS, Street Crossing Game, and other games that use haptic devices) are typically too challenging for our students with visual impairments. Our students lack foundation “computer space” concepts. Our current focus is to develop accessible computer games for young students; these games are geared to systematically teach the lacking foundation computer concepts. Our long-term goal is to create a computer curriculum for students with visual impairments. This curriculum will use a variety of games to teach/reinforce core and expanded core curriculum skills as well as building foundation and advanced computer skills. Technology is the “great equalizer” for students with visual impairments!

Carolina Assistive Technology is also working on developing a website which will include training videos, teaching hints, comments from teachers, and to provide a simple way for teachers to send in/download teacher made games that were created using Carolina software. This workshop session “Computer Games for Students with Visual Impairments” is a quick overview of some of the most popular CAT computer games. Workshops are available for in-depth training (which includes how to make your own Hark games, SamiSays Templates, O&M computer games, etc.) For more information, please contact Diane Brauner.

CAT games are currently being created and released. Feel free to check Gary Bishop’s website or contact Diane Brauner for updates.

If you have potential funding ideas to support the CAT project, please contact Diane Brauner!

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HARK THE SOUND – DETAILED INFORMATION:

What is it like?

When the game starts up you hear the prompt “Welcome to Hark the Sound, use the left or right arrow keys to choose a game to play. Use the up arrow key to select a game”. As you press the left arrow or right arrow key you will hear the names of games and folders. For example when I press the right arrow key repeatedly I hear “Braille Games Folder”, “Category Games”, “Math Games”, “Naming Games”, “Pad Games”, “Word Games”.

The Escape key (often labeled ESC in the upper left corner of the keyboard) will quit the current game and return to the game selections. You also use Escape to move up in the folder hierarchy.

Hark the Sound includes three types of games; Naming Games, Category Games, and Pad Games. We’ll describe each of these separately.

NAMING GAMES

The object of Naming Games is to name a sound or tune that is presented as a prompt. A typical round in Name That Animal goes like this:

1. You hear “Can you name this animal?”
2. Then an animal sound is played, for example a dog barking.
3. You use the left or right arrow keys on the keyboard to move through and hear the possible answers. In this case they might be “Cat”, “Dog”, “Elephant”, and “Horse”.
4. In some games, the down arrow key will give a hint about the correct answer.
5. When you hear the correct answer, you press the up arrow key to guess.
6. If the chosen answer is correct, you will hear a reward sound which might be a crowd cheering, or a musical fanfare. If the answer is incorrect, you will hear “Try again.”

7. The process then repeats playing another one of the sounds for the four animals.

8. When all the animals in the group have been played, the game begins another round with four more animals.

Naming games shipped with Hark the Sound include:

- **Braille Letters**: Identify Braille letters from the given the dots (Ex. When given dots 1, 2, and 3, the student chooses letter L)
- **Braille Whole Word Contractions**: Identify Braille letter contractions from the given dots. (Ex. When given dots 1 and 3, the student chooses the word 
- **Name that Sound**: Identify environmental sounds. (Ex. A booming sound is thunder.)
- **State Nick Names**: Given the name of a state the student chooses the corresponding nick name. (Ex. Connecticut is the Constitution State)
- **Musical Instruments**: Identify instruments from the sound they make. (Ex. When a flute sound is played the student chooses flute)
- **Name that Animal**: Identify animals from the sounds they make. (Ex. After hearing barking the student selects dog).
- **Name that Capital’s State**: Identify states given their capital city. (Ex. Harrisburg is Pennsylvania.)
- **Name that Color**: Identify the color of common objects given their name. (Ex. Snow is white.)
- **Name that Holiday**: Identify holidays from short descriptions. (Ex. When asked to identify which holiday has red, white, and blue as special colors, the student would choose Fourth of July)
- **Spelling Words**: Identify words from their spelling. (Ex. ‘C’, ‘A’, ‘T’, spells cat)
- Addition 1-5: Identify the sum given a pair of numbers ranging from 1 to 5. (Ex. 0 plus 1 is 1.)
- Addition Easy 6-10: Identify the sum given a pair of numbers in the range 6-10. (Ex. 10 plus 0 is 10.)
- Addition Hard 6-10: Identify the sum given a pair of numbers. (Ex. 7 plus 7 is 14).
- Counting: Count how many times a sound is played. (Ex. After hearing a bark sound three times the student chooses three)
- Multiplication Drills: Identify the product given a pair of numbers. (Ex. 9 times 7 is 63)

When you are playing a Naming Game, clicking the Game button will popup a dialog that will allow you to control:

- Choices per round: the number of choices the player will be given in each round of play. We find using a smaller number helps younger children get the idea.
- Repeat Rounds: When set the game will repeat the choices in each round. We find that some students benefit from having the teacher first model the game play and then allow them to do it.
- Pair answers with prompts: When set the game will give the answer along with the prompt. Again, young and lower functioning players may benefit from hearing the direct association.

**CATEGORY GAMES**

Category games ask questions like “Which of these things is not a fruit” or “Which of these things belongs in electronics?”. The player then uses the left or right arrow keys to hear their choices and they use the up arrow key to make their choice.

These games include:

- Learn about food groups: Students choose the food that does or does not belong to a food group. (Ex. When asked to identify the
vegetable the student selects “green beans”). This game includes pictures.

- Wal-mart Categories: Students choose the item that does or does not belong in a section of a typical Wal-Mart. (Ex. Pencils belong in school supplies.)

When you are playing a Category Game, pressing the Game button will allow you to control several options.

- Choices: Control the number of choices the player has in each round of play.
- Repeat Rounds: When set the game will repeat each round allowing the teacher to first model the game play.

**PAD GAMES**

All of the games above may be played with the DDR pad. We also include several games that only work with the pad. Acquiring and setting up the DDR pad is described in DDR Pad Setup.

- Braille Twister: Players use their head, hands, feet, etc. to hold down the dots in a giant Braille Cell on the DDR pad. The left and right columns of three dots form the cell. We glue tactile markers to the pad to enable players to find the dots by touch with the hands or feet. Each dot optionally makes a sound and/or announces its dot number when it is pressed. (Ex. The game might say “Make the letter B” and the student has to hold the corresponding dots down for 1 second)
- Braille Twister Animals: Just like Braille Twister but with animal sounds.
- Pad Play: An unstructured version of Braille Twister for introducing students to the pad. Each dot makes a sound and optionally announces its number. When the dots are held down, the corresponding Braille Letter is announced.
- Pad Play Animals: Like Pad Play but with animal sounds.
O&M GAMES

Yes, it is easy to make O&M games for specific schools, stores, and communities. Contact Diane Brauner for more information on O&M games! Most of the O&M Hark games are NOT on the website, as they are specific schools, communities or businesses. (You must either know or have access to a map of these specific schools, communities or businesses in order to successfully play the O&M games.

CAN I ADD NEW GAMES?

Hark the Sound Version 3.4 includes features designed to make it easy for you to modify existing games and to create new ones. Making a game is described in “How to Make a New Game” and we also have “Step by Step Instructions”. (See handout)

WHAT IS THE USER INTERFACE LIKE?

The screen shot above shows the user interface. The player doesn’t have to use any of this. The games start up ready to play using only the arrow keys and the Escape key. The controls allow the teacher to adjust the game to suit the needs of different children.

Quit terminates the game. Game is used for setting game options and editing game content; it works after a game has been selected. System sets system options that apply to all games.

Normally the game ignores all keys except for escape and the arrow keys. To allow users of JAWS and other screen reader software to access the game controls we have a special key combination to unlock the keyboard. If you press the SHIFT, CONTROL, and TAB keys simultaneously, the keyboard will be unlocked and keyboard focus will go to the Quit button. The tab key will then move you from control to control as for normal windows applications. Your screen reader should announce the name of each control. The user interface still needs a little
work to make it work well with JAWS. The purpose of the Lock button is to relock the keyboard after you’re done making adjustments. It is never needed otherwise.

The Volume control allows you to adjust the main system volume control. You may also need to adjust the volume for “Wave” before starting the game.

The System button allows you to control many options that will allow you to customize the games for different students. You can learn about these options in the section System Options section.

**HOW DO I RUN IT?**

After installing it, you can run the game just like other Windows applications. Click-on Start, then Programs (or All Programs on some systems), then Hark The Sound, then Hark The Sound. You should here it say “In the games folder. Use the arrow keys to choose a game to play. Use the up arrow to start a game.” If you do not hear anything, please check the volume settings for sounds on your computer. If you can hear sounds from other applications then you should be able to hear the game.

**WHERE CAN I GET IT?**

You can download the game free from [http://wwwx.cs.unc.edu/~gb/wp/research/](http://wwwx.cs.unc.edu/~gb/wp/research/). The download is about 15 megabytes and unfortunately does not include everything you need for a few computers. Detailed instructions are included on the website for downloading the components and installing them on various versions of Window and Vista. When you are prompted during the installs described below, it should always be safe to just click on the Next button.

If you are unable to download Hark the Sound, please contact Gary Bishop or Diane Brauner.
HOW MUCH DOES IT COST?
Hark The Sound is free for educational use. Further, you can make copies to give away to your friends. Your school can have as many copies as you like. Anyone can use it for any purpose as long as you do not sell it. Our goal is for kids to have fun!

DOES IT WORK WITH INTELLIKEYS?
You can download a simple overlay for use with Intellikeys. Teachers have had great success using the games with kids with multiple handicaps.
This project is supported by the U.S. Department of Education, Office of Special Education Programs (OSEP). Opinions expressed herein are those of the authors and do not necessarily represent the position of the U.S. Department of Education.