1 Blindfold Games Overview

The Blindfold Games enhance the lives of thousands of visually impaired people thanks to its innovative approach to accessible gaming.

These games are extremely popular within the blindness community because they are fun, appeal to all ages, and the game just feels right to a blind person. It is this last feature – feeling right – that distinguishes Blindfold Games from most other products on the market, and it took thousands of hours of research, testing and refinement to achieve.

Innovation in the Blindfold Games extend from tactile literacy and learning to social interaction, and each game offers:

- Applicability to all age groups
- Consistency of usage and Incremental Learning
- Immersive Audio Environment
- Gamification of tactile and auditory processing
- Physicality and fine motor control
- Development of exploration skills
- Increased social interaction online & offline

1.1 Applicable to All Ages

Many in the blindness community consider their mobile phones to be valuable tools for day-to-day living, but do not expect their phones to provide entertainment. It's not unusual for me to receive an email mentioning how thankful someone is that she can have fun with her phone, just like her sighted friends do. Prior to our games, it never even occurred to them.

Most audio games for blind people are immersive role-playing audio games, or audio shooting games. While that might appeal to teens and young adults, it has little traction with older adults or children.

My goal was to make games that everyone would play, not just gamers. The initial games were ones that blind people played as real-world games, and they were already familiar with the rules. That eliminated the first barrier from making the games popular: anyone who had played the game before – either prior to losing their sight, or with friends using braille or tactile game pieces – knew how to play the game.

For example, the first two card games created – Uno (Blindfold Wildcard) and Crazy Eights – are easy to play and everyone knows the rules. Bringing those games to the iPhone has been life changing for some people. If a blind person wanted to play Uno, they had to find a friend nearby and use a braille card deck. Now, they can just pull out their phone at anytime and start playing.

The multiplayer card games created so far - Hearts, Spades, Rummy and Dominoes – are the same games that are played with friends or in a community setting. All provide competent computer opponents, and offer hours of entertainment.

The casino games – Blackjack, Video Poker, Roulette and Craps – follow the same pattern: the games are already well understood; and have been played in casinos with the help of a sighted friend. With the Blindfold Games, players improve their skills and test out different strategies.

The puzzle games – Sudoku, Cryptogram, Word Ladder and Boggle (both in Blindfold Word Games) - are familiar and help develop analytical and vocabulary skills. Blindfold Simon is memory game inspired by the "My Simon" game that many blind players enjoyed in their youth.

One of the movement games, Bowling, is popular because it is so similar to the way the game is played in Blind Bowling leagues. Others, such as Pong or Breakout, are hits because people enjoyed the games prior to losing their vision.

Several of the games are mentioned in NBP's Anyone Can Play book, and the games are featured on AppleVis, AudioGames.net and AFB's Access World.

1.2 Consistency of Usage and Incremental Learning

After you download a game, the game has about 2 minutes to "wow" you to invest your time learning the game. If you aren't "wowed", you get bored and move onto a different game. Games that take time to learn have little "wow" factor.

To reduce the learning curve, all Blindfold Games provide the same structure and layout. This familiarity lets you understand the navigation, immediately locate the user guide, browse through it, and begin playing the tutorial level of the game. If you need to acquire skills, the game first teaches you one skill, "wows" you as you play with that skill, then teaches you another skill, and "wows" again as you move up levels in the game.

Blindfold Racer is a classic example of how the "wow" factor and incremental learning are used. A 90 second interactive tutorial teaches you how to drive, avoid obstacles and win; then you start the game.

If you've never played Racer, it's rather simple. You steer with your ears instead of your eyes. If you steer too far to the left, the music gets louder in your left ear; too far to the right, and it's louder in your right ear. To avoid obstacles on the road, like a cow mooing, keep the cow sound on your left or on your right. To aim for prizes on the road, steer so the sound is balanced in the center of your head.

The first few levels of Racer improve your coordination between steering and audio processing. By the fifth level, you learn gestures for picking inventory items up (two finger tap), or dropping them off (two finger tap). After practicing that for a few levels by getting popcorn and soda to feed a troll, you learn how to speed up (swipe up) or slow down (swipe down).

Consistency extends to the menus in the games. The main menu, and the other menus (help, settings, upgrades, scores) are similarly laid out and use voice-over or braille display, and the gestures used in each class of game are similar. The game screen never uses voice-over, so that gestures match game play, and the game is self-voicing (and is compatible with a braille display).

Gestures are consistent through each category of games; for example, in card games, flicking left and right moves through your hand; double tapping plays a card; triple tapping usually takes a card from the deck; swiping up with 3 fingers goes back to the main menu and swiping left with 3 fingers un-does a move.

1.3 Immersive audio environment

The Blindfold Games present an audio environment that keeps you engaged in game play, and your attention focused.

For games that simulate real-world action, you listen to a real-world soundscape. In the casino games, you select from several casino soundscapes. In bowling, you hear a bowling alley, and in the Skee Ball (Blindfold Vee Ball), you hear an arcade soundscape.

The music in the card and logic games are related to the game, and have an upbeat tempo. The games have been tested using different music styles, and the background music helps you concentrate on game play.

Some games use music as an integral part of the game. Blindfold Racer uses an audio fence on each side of the road; each level of the game uses a different music track as the fence, ranging from classical to reggae to pop to world to jazz to country.

Blindfold Hopper is an audio version of the classic video game Frogger, where you jump from lily pad to lily pad. Each successive lily pad is represented by a short music loop, and to jump, you move your lily pad – which is your phone - to line up with the oncoming lily pad. You do this by keeping the music loop centered in your head. Once the two lily pads are lined up, you tap the screen and wait for the next lily pad music loop.

1.4 Gamification of tactile and auditory processing

A common description of Blindfold Games is that "they just feel right".

Unlike most accessible games, where accessibility is bolted on after the game is finished, Blindfold Games are built from the ground up matching tactile gestures to game play. You don't search on the screen for the right button to double tap for each and every game action. Instead, tactile gestures match game action.

Not only does that make game play more natural and faster; it truly opens up the world of gaming to visually impaired people.

For example, in a card game, you flick right and left to review your cards, flick right and left with 2 fingers to jump from card group to card group, swipe up and down with 2 fingers to hear groups of your cards, and tap once, twice or three times to play cards in a certain manner.

This simplicity of game play has a dramatic effect on the enjoyment of the game, and the perceived value of the phone. Extra gestures that blind people must employ to use an accessible app are eliminated, and what remains is pure fun.

Without realizing it, each player is benefiting from gamification of the tactile and auditory processing required for playing these games well.

The gamification of learning is an educational approach to motivate students to learn by using video game design and game elements in learning environments. Its goal is to maximize enjoyment and engagement through capturing the interest of learners and inspiring them to continue learning.

The games target skills for the player to enhance; by mastering those skills, his game score continues to improve.

Gamification encourages social interaction by sharing your scores with others; it's easy to post your progress to your favorite social network: Twitter, Facebook or Apple's Game Center.

1.5 Physicality and Fine Movement Control

Where appropriate, each Blindfold Game requires a great deal of physicality to play well.

At one end of the spectrum, in the movement games, such as Pong, Breakout, Hopper and Air Hockey, you must swing the phone left and right to move your paddle in the corresponding direction. You do this by sitting in a swivel chair and moving your entire body, or by swinging your arm left and right.

In Juggle, you must flick your wrist upward, as if you are tossing a ball in the air, while moving your body or your arm, left or right.

At the other end of the spectrum, Bowling and Skee Ball require fine finger control to launch the ball at the target. You learn to position yourself on the playing field, and carefully control your finger's actions. Consistent with the incremental learning described earlier, Bowling teaches you how to bowl with a one-finger flick, then with one-finger aim-and-flick, and finally with a two-finger aim-and-flick. Using fine motor control, you've mastered the speed, direction and angle of the bowling ball.

1.6 Development of exploration strategies and fine motor control

Exploring a mobile phone screen is not a commonly exercised skill for blind people, but it is a skill that helps with navigation apps, such as Google Maps.

Several Blindfold Games improve this skill as part of its game play. In Racer, after each level is played, you can move your finger around on the screen to determine the layout of the track and where the obstacles and prizes are. As your finger touches the road, you hear the road; when you finger touches an obstacle or a prize, you are told what it is. Once you develop a mental picture of the level, you can play it again more effectively.

In Blindfold Barnyard, you must explore the entire playing field to find animals and drag them to a fence, where they can then be moved into the barn. The most effective way to play the game is to use similar strategies of finding objects – divide the target area into small chunks, and work from one end to the other, completely covering each chunk.

As your finger passes over an animal, the animal speaks: the cow moos and the horse neighs. Once you become proficient at the easy level with large animals, you increase difficulty by making the animals smaller. As the animals get smaller, you

must improve your fine motor control and have better awareness of the target area to find the animals.

Alternatively, if you cannot find the animals using normal search strategies, the game will tell you in which clock direction you must travel to find the animal. This too provides practice in translating directions into fine motor control.

Blindfold Tile Puzzle and Sudoku require that you maintain a mental image of the puzzle; the more you play each game, the better your exploration strategies become.

1.7 Increased social interaction

The Blindfold Games promote game play between two people, online or offline.

Passing the phone back and forth between two players is available in several Blindfold Games. In Simon, each player tries to memorize a sequence of gestures and then repeat those gestures. As the game proceeds, one player attempts a sequence, and then another player attempts the sequence. The game ends when one of the players makes a mistake.

In Bowling, you alternate throwing the bowling ball with your friend, just like in the real world. Competition with a friend sitting next to you makes the game more realistic and promotes faster skill acquisition.

In Crazy Eights and Wildcard, you play with other people anywhere on the Internet. You can invite a friend to play cards, or you can be automatically matched with someone on the Internet. Even though you and the other player live in different cities, you become friends by playing together every day.

2 Educational & Therapeutic Components

The Blindfold Games can be useful in building skills, and tracking the development of these skills.

We are looking to partner with schools and organizations that provide services to the visually impaired community, to use these games as educational tools. For example, in each game, we can track which skills a player has mastered, and record this information in the cloud, and the deliver it to a teacher or therapist to evaluate her client's progress. Children and adults are far more likely to invest time into play a game than to perform other therapeutic tasks.

We are also looking to align some of the skills needed to succeed at the games with the Common Core standards, and track the acquisition of those skills in the cloud, and report that information back to teachers.

3 Success to date

Blindfold Racer has been downloaded by about 7,500 people (blind and sighted) and has been available for about 2 years. Each of the other Blindfold Games has been downloaded by 500 to 2,500 people (primarily blind).

The games are available on the iPhone, iPad and iPod so it meets the needs of several different communities. For people not on fixed income, the games work on all of the popular iPhones and iPads; for people using the games in community settings, the games work on the older generation of iPads, usually running iOS 7.1. For people who have limited income, the games work on used iPods that can be purchased for under $30.

While the games can be played on a limited basis for free, about 15% of the people who download the game purchase an in-app upgrade for their favorite games, and based on emails I receive, each person plays two or three of the games regularly.

Other Materials

Several of the visually impaired testers have created profiles of the Blindfold Games on AppleVis, and AppleVis now hosts a forum just for our games. One of the testers has created podcasts describing many of the games. We also have a video created at the Perkins School showing teens playing Blindfold Racer. The students in video talk about their experience with the game. The link to these resources is at:

http://blindfoldgames.org/resources

I continue to update a blog that follows the development of all of the apps:

http://blindfoldgames.org