
PlayIT

Project Report

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HCI 595X Visual Design for HCI

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Summer 2012

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Project Summary

The Play•IT project was an exercise in designing for social inclusion for Debra Satterfield's Summer 2012 HCI 595 class at Iowa State University. The intent of the project was to design a play experience, preferably with an educational component, intended to mediate social interactions between autism spectrum disorder (ASD) children and their neurotypical peers.

Some of the project parameters included:

- Targeting children 6 to 12 years old.
- Focusing on the critical social and language skills needed by the target group.
- Considering the difficult social, ethical, and physical issues involved in meeting the needs of both ASD and neurotypical children.
- Making the experience fun and interesting for both ASD and neurotypical children.
- Incorporating multi-sensory data into a visual design solution.
- Integrating learning techniques into an informational interface.
- Including differential reinforcement and motivation for the learner with autism.
- Ensuring that the learning outcome is beneficial to both ASD and neurotypical children.
- Creating an identity or brand that does not represent the artifact as an “autism” product.
- Making design decisions that are informed by research.

Concept

Tiki-Tak-Totem is an interactive, two-player, tic-tac-toe-style browser game targeted to children in the 6-8 age group. The game is suitable for neurotypical children as well as children with high-functioning autism and Asperger syndrome. Players select a square, and in order to get an X or an O, they must meet a challenge. Types of challenges include:

- Matching a facial expression to an emotion.
- Matching a gesture to its meaning.
- Matching a voice tone to an emotion.
- Matching a sound to a picture of its source.
- Unscrambling a scrambled word.
- Matching a person's clothing to an activity or occupation.
- Matching a word to a definition.
- Selecting the most socially appropriate response to a question.
- Completing a sentence.
- Given a specific situation, choosing a response that demonstrates respect, kindness, or empathy.

There are many challenges that are specifically designed to help improve the social interaction and communication skills of the child with autism spectrum disorder, while still being appropriate and fun for neurotypical players.

The primary play area is a typical tic-tac-toe grid. Flanking the tic-tac-toe grid are two tiki totems, each consisting of three or four faces. When the player clicks a square on the grid, a challenge is revealed. If the player responds correctly, the player receives an X or an O. When a player completes a horizontal, vertical, or diagonal row (gets a tic-tac-toe), the lowest face on their tiki totem illuminates. Whichever player lights all the faces on their tiki totem first wins the game.

Color Palettes

My research didn't indicate much in the way of specific color preferences among autism spectrum disorder children. I did read, however, that autistic children often perceive colors with greater intensity than neurotypical children, and that bold, bright colors such as red may appear almost fluorescent to them. I also read that light or muted pink was a favorable color to children with learning disabilities (Paron-Wildes, 2005). So, I decided to exclude red and include pink.

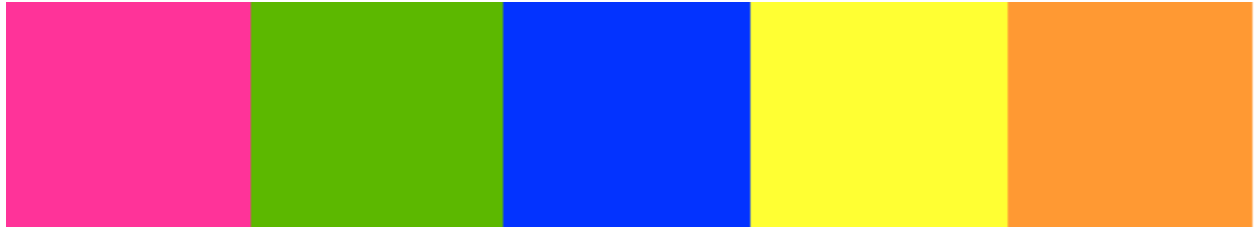
Also, I wanted to include two cooler, balancing colors along with two cheerier colors. Reading various message board posts by parents of autistic children, the colors green, blue, yellow, and orange seemed to be frequently cited as favorites. I came up with the following five tentative color palettes by trial-and-error using [Color Schemer Online](#) and the [VisiBone](#) color chart. The fifth palette I made by picking my favorite of each of the colors from the other four palettes.

Palette 1



Hex FF66CC	Hex 339966	Hex 003399	Hex FFFF66	Hex FF6633
RGB 255 102 204	RGB 51 153 102	RGB 0 51 153	RGB 255 255 102	RGB 255 102 51
CMYK 6 70 0 0	CMYK 79 17 77 3	CMYK 100 91 6 1	CMYK 4 0 71 0	CMYK 0 75 85 0

Palette 2



Hex FF3399	Hex 5CB800	Hex 0333FF	Hex FFFF33	Hex FF9933
RGB 255 51 153	RGB 92 194 0	RGB 3 51 255	RGB 255 255 51	RGB 255 153 51
CMYK 0 90 0 0	CMYK 67 1 100 0	CMYK 86 73 0 0	CMYK 6 0 89 0	CMYK 0 48 88 0

Palette 3



Hex FF99CC	Hex 006633	Hex 333399	Hex FFFF99	Hex FF6600
RGB 255 153 204	RGB 0 102 51	RGB 51 51 153	RGB 255 255 153	RGB 255 102 0
CMYK 0 50 0 0	CMYK 90 34 100 27	CMYK 96 95 0 0	CMYK 3 0 49 0	CMYK 0 74 100 0

Palette 4



Hex FF99FF	Hex 669966	Hex 000099	Hex FFFF00	Hex FF9966
RGB 255 153 255	RGB 102 153 102	RGB 0 0 153	RGB 255 255 0	RGB 255 153 102
CMYK 11 43 0 0	CMYK 64 22 74 4	CMYK 100 98 5 6	CMYK 6 0 97 0	CMYK 0 49 62 0

Palette 5



Hex FF99CC	Hex 006633	Hex 003399	Hex FFFF66	Hex FF9933
RGB 255 153 204	RGB 0 102 51	RGB 0 51 153	RGB 255 255 102	RGB 255 153 51
CMYK 0 50 0 0	CMYK 90 34 100 27	CMYK 100 91 6 1	CMYK 4 0 71 0	CMYK 0 48 88 0

Name Ideas

At first, all I really knew about my game was that it would be based on tic-tac-toe. I started thinking of variations on the name tic-tac-toe. I thought the British name “noughts and crosses” wouldn’t make much sense to American children, so I stuck with trying to think of variations on “tic-tac-toe” or “Xs and Os.” Mostly, I started by typing out “tic-tac-toe” with variants of the syllable “toe.”

Tic-tac-bo	Tic-tac-moe	Tic-tac-tow
Tic-tac-beau	Tic-tac-mow	Tic-tac-tote
Tic-tac-bow	Tic-tac-no	Tic-tac-totem
Tic-tac-crow	Tic-tac-po	Tic-tac-throw
Tic-tac-doe	Tic-tac-poe	Tic-tac-whoa
Tic-tac-dough	Tic-tac-pro	Tic-tac-woe
Tic-tac-flo	Tic-tac-quo	Tic-tac-yo
Tic-tac-flow	Tic-tac-row	Tic-tac-zo
Tic-tac-foe	Tic-tac-so	Tic-tac-below
Tic-tac-go	Tic-tac-sew	Tic-tac-hello
Tic-tac-grow	Tic-tac-show	Tiki-tac-toe
Tic-tac-glow	Tic-tac-slow	Tick-tock-toe
Tic-tac-joe	Tic-tac-snow	Xoxo
Tic-tac-know	Tic-tac-sow	Oxo
Tic-tac-low	Tic-tac-stow	Xox

None of the above really appealed to me at first.

My next thought was to name the game “Tiktakto,” which is the Esperanto word for “tic-tac-toe.” I thought this name would be very representative of the project, since the game is meant to mediate social interactions between autistic and neurotypical children, and Esperanto was created as an easy-to-learn auxiliary language that could mediate communication between people from different countries and cultures.

However, I thought the name wouldn’t have much appeal to anyone not familiar with Esperanto, and also the name really didn’t provide the added dimension I was looking for that indicated the game was something more than merely tic-tac-toe.

As I thought through the game play, I began to visualize some type of column on either side of the tic-tac-toe grid. If a player answers enough correct questions and gets a tic-tac-toe, maybe a progress bar would move up the column or a light would light. Whichever player reached the top first would win the game.

That’s when the “tic-tac-totem” name started to make sense. The progress bar could be a totem pole. Each time a player got a tic-tac-toe, a face on their totem could illuminate. Once a player has lit all the faces on their totem, they are the winner. Then I began to wonder if there was such a thing as a tiki totem, which there apparently is, so I combined “tiki-tac-toe” and “tic-tac-totem” to make “tiki-tak-totem.”

Font Test

For my logotype, I wanted to use a font that was fun but still legible. I decided to just scroll through every font I have installed and picked 20 or 30 that I thought might work at first glance. Those fonts and their format are listed below, along with the logo text in both a single-line hyphenated version, and a three-line, unhyphenated version with an added exclamation point.

Australian Sunrise	Tiki-Tak-Totem	Tiki Tak Totem!
TrueType		
Berlin Sans FB	Tiki-Tak-Totem	Tiki Tak Totem!
OpenType		
Berlin Sans FB Demi	Tiki-Tak-Totem	Tiki Tak Totem!
OpenType		
Bernard MT Condensed	Tiki-Tak-Totem	Tiki Tak Totem!
OpenType		

Brody

Tiki-Tak-Totem

Tiki

TrueType

Tak

Totem!

Cooper Black

Tiki-Tak-Totem

Tiki

OpenType

Tak

Totem!

Curlz MT

Tiki-Tak-Totem

Tiki

OpenType

Tak

Totem!

Excelsior Sans

Tiki-Tak-Totem

Tiki

TrueType

Tak

Totem!

Forte

Tiki-Tak-Totem

Tiki

OpenType

Tak

Totem!

Gilgongo Tiki

TrueType

Tiki-Tak-Totem

Tiki

Tak

Totem!

Gill Sans

Ultra Bold

Condensed

Tiki-Tak-Totem

Tiki

Tak

Totem!

OpenType

Hamburger

Heaven

Tiki-Tak-Totem

Tiki

Tak

Totem!

TrueType

Hobo Std

Tiki-Tak-Totem

Tiki

Tak

Totem!

OpenType

Informal

Roman

Tiki-Tak-Totem

Tiki

Tak

Totem!

OpenType

Jokerman

Tiki-Tak-Totem

Tiki

OpenType

Tak

Totem!

Kristen ITC

Tiki-Tak-Totem

Tiki

OpenType

Tak

Totem!

Lithos Pro

TIKI-TAK-TOTEM

TIKI

Regular

TAK

OpenType

TOTEM!

Matisse ITC

TIKI-TAK-TOTEM

TIKI

OpenType

TAK

TOTEM!

Matura MT

Tiki-Tak-Totem

Tiki

Script Capitals

Tak

OpenType

Totem!

Mistral

Tiki-Tak-Totem

Tiki

OpenType

Tak

Totem!

Olijo

Tiki-Tak-Totem

Tiki

TrueType

Tak

Totem!

Philly Sans

TIKI-TAK-TOTEM

TIKI

OpenType

TAK

TOTEM!

Pristina

Tiki-Tak-Totem

Tiki

OpenType

Tak

Totem!

Rage Italic

Tiki-Tak-Totem

Tiki

OpenType

Tak

Totem!

Ravie

**Tiki-Tak-Totem Tiki
Tak
Totem!**

OpenType

Showcard

Gothic

**TIKI-TAK-TOTEM TIKI
TAK
TOTEM!**

OpenType

Snap ITC

**Tiki-Tak-Totem Tiki
Tak
Totem!**

OpenType

Tall Paul

Tiki-Tak-Totem Tiki
Tak
Totem!

TrueType

Tekton Pro

Tiki-Tak-Totem Tiki
Tak
Totem!

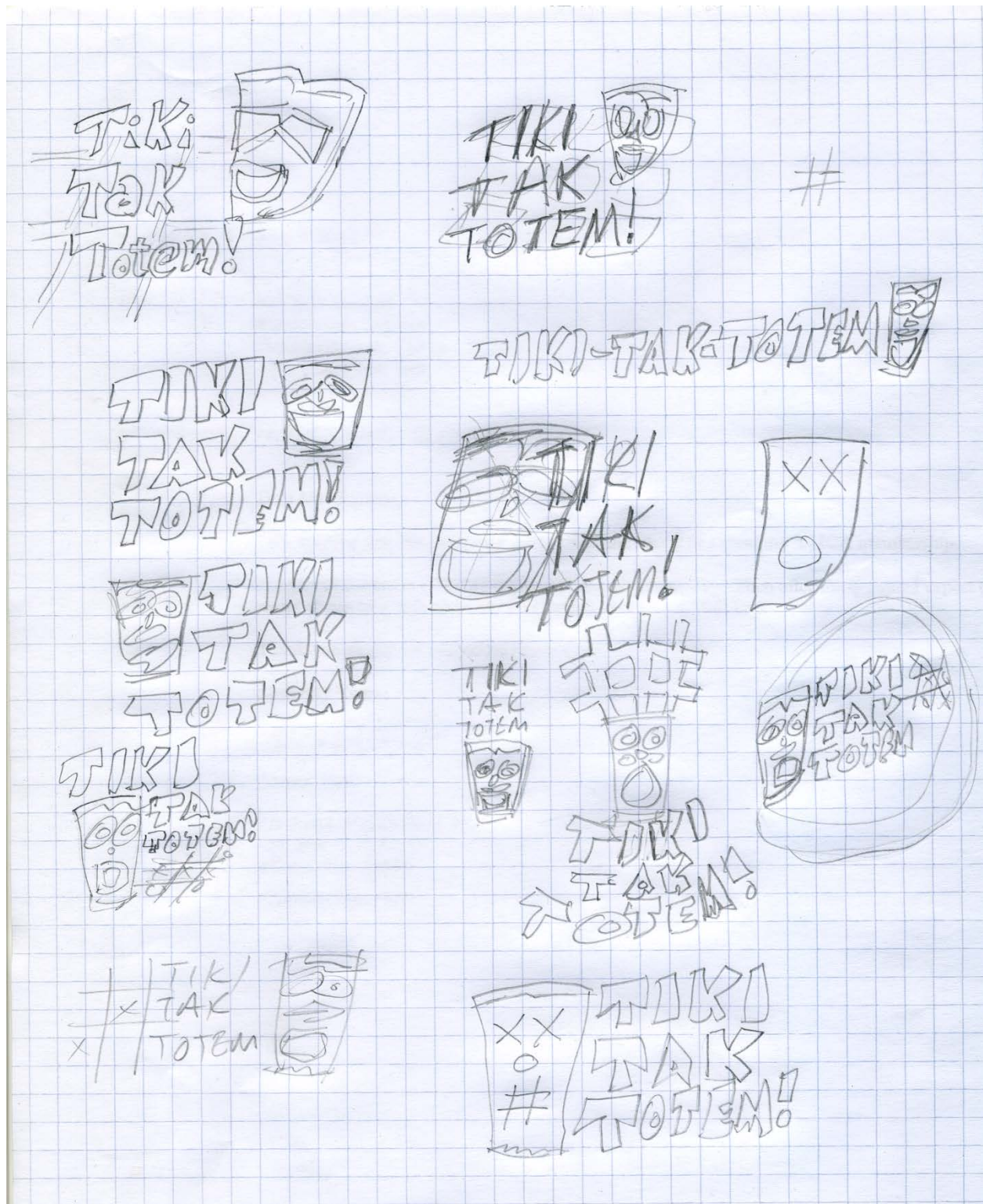
OpenType

Unicorn NF

**Tiki-Tak-Totem Tiki
Tak
Totem!**

TrueType

Logo Sketches



Digitized Logos

TIKI
TAK
TOTEM!



TIKI
TAK
TOTEM!



Tiki
Tak
Totem!



Tiki
TAK
TOTEM!



Tiki
Tak
Totem!



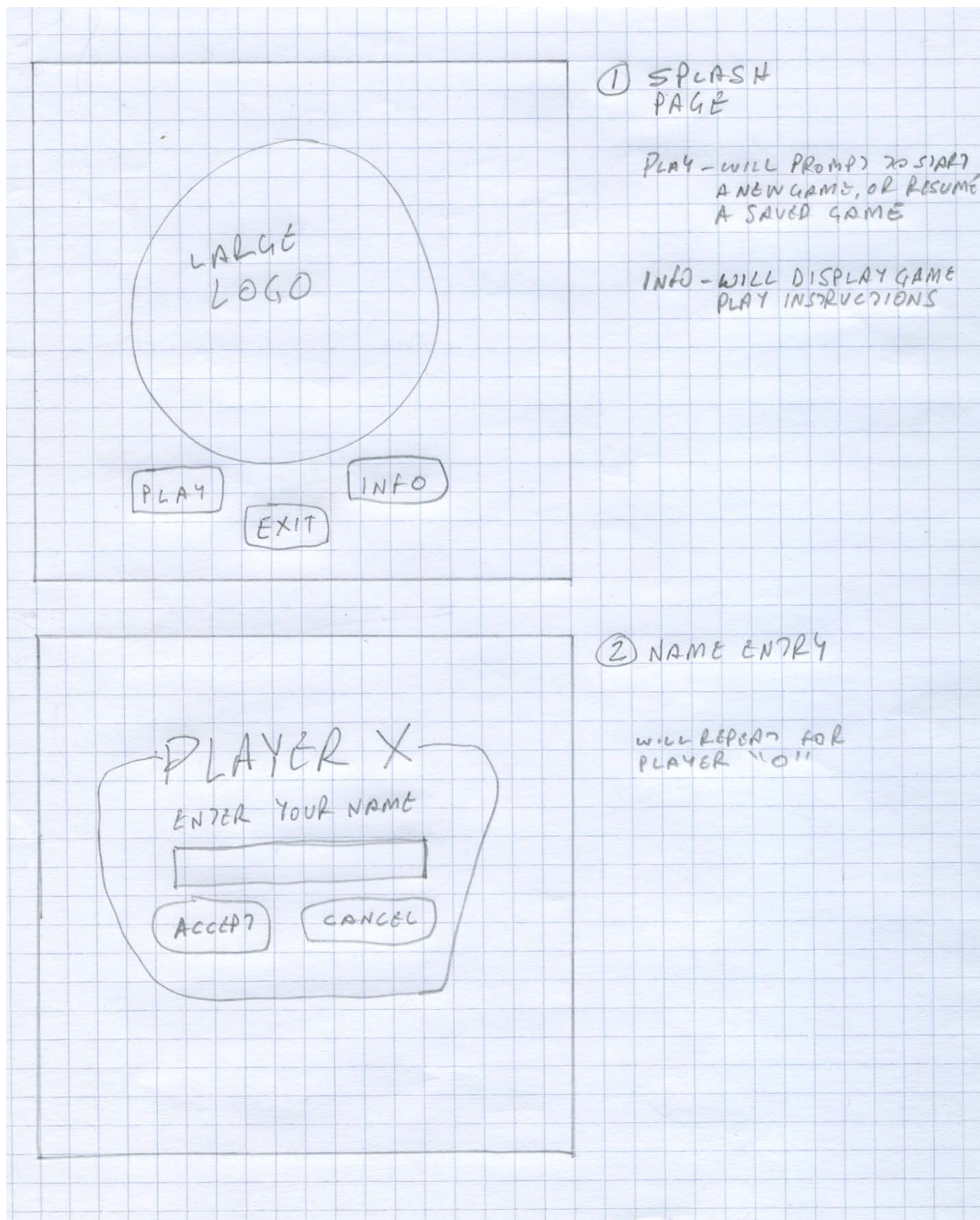
Tiki
Tak
Totem!

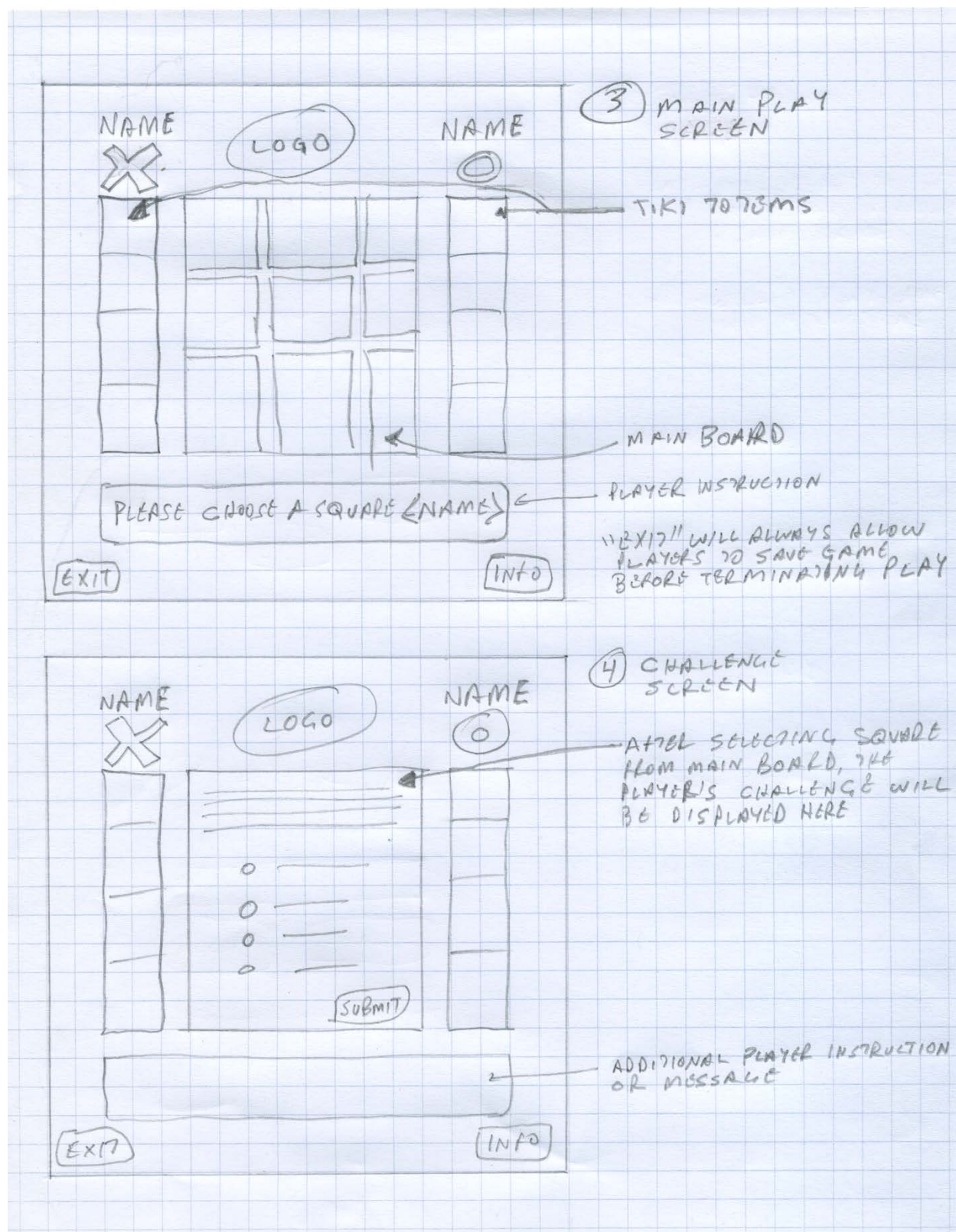


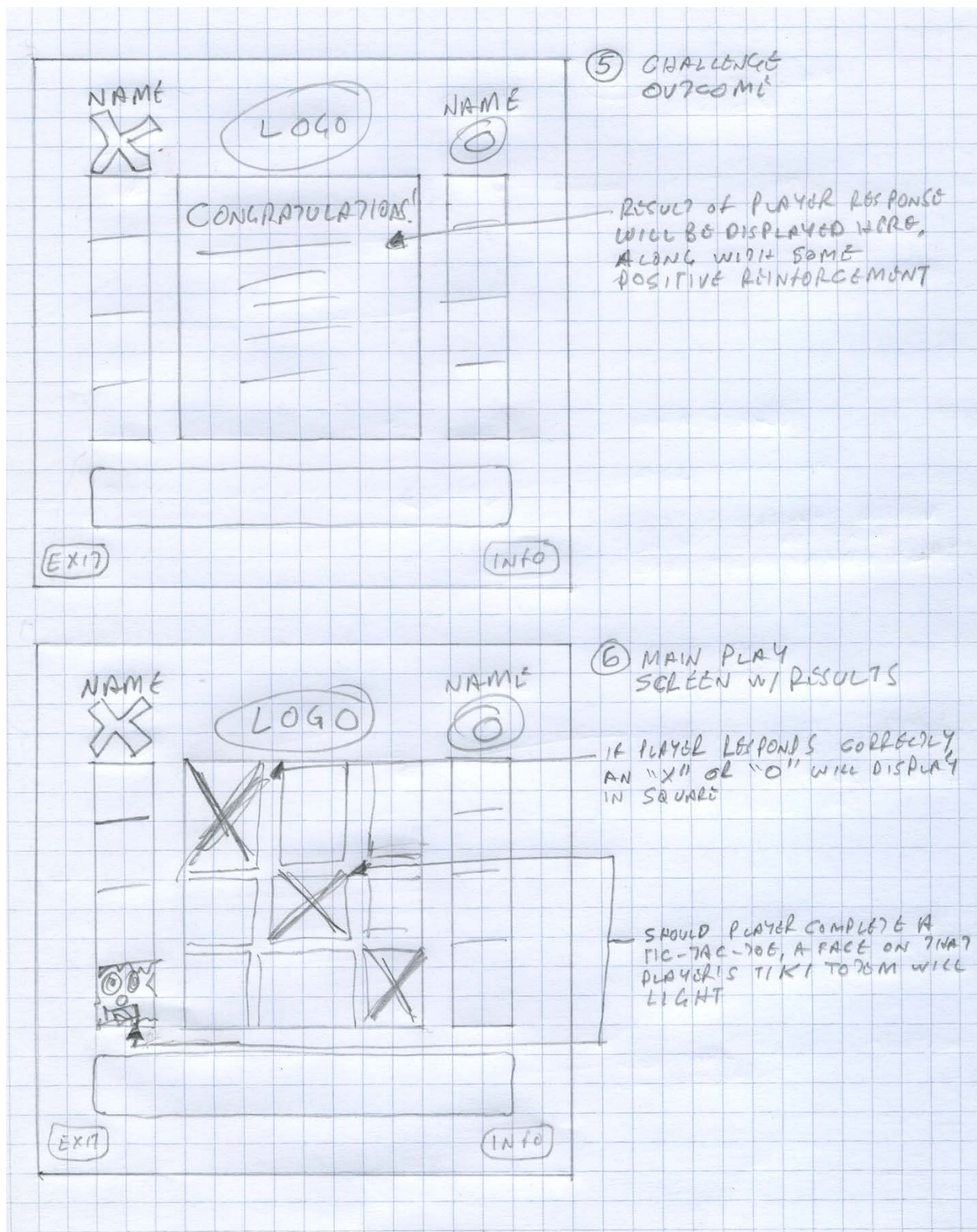
Final Logo



Wireframes

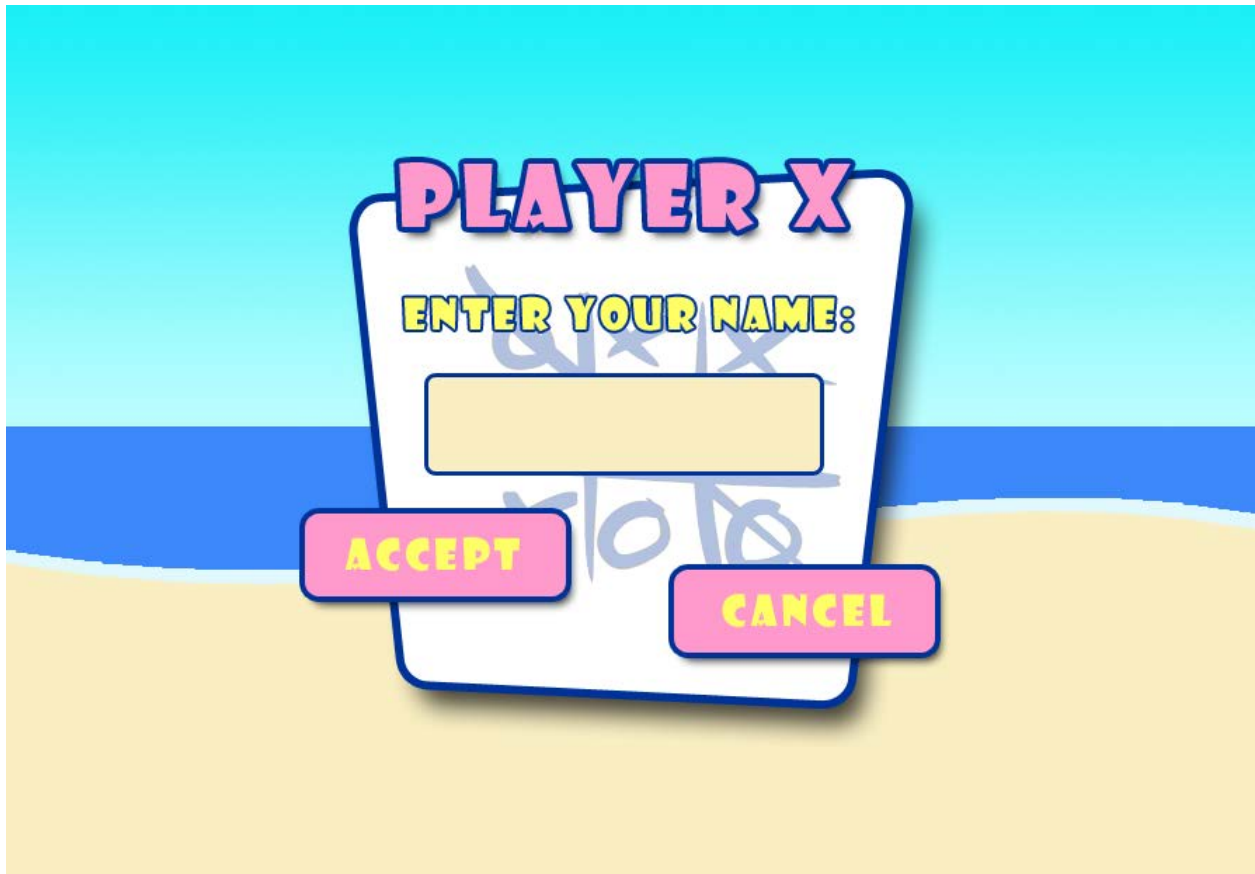


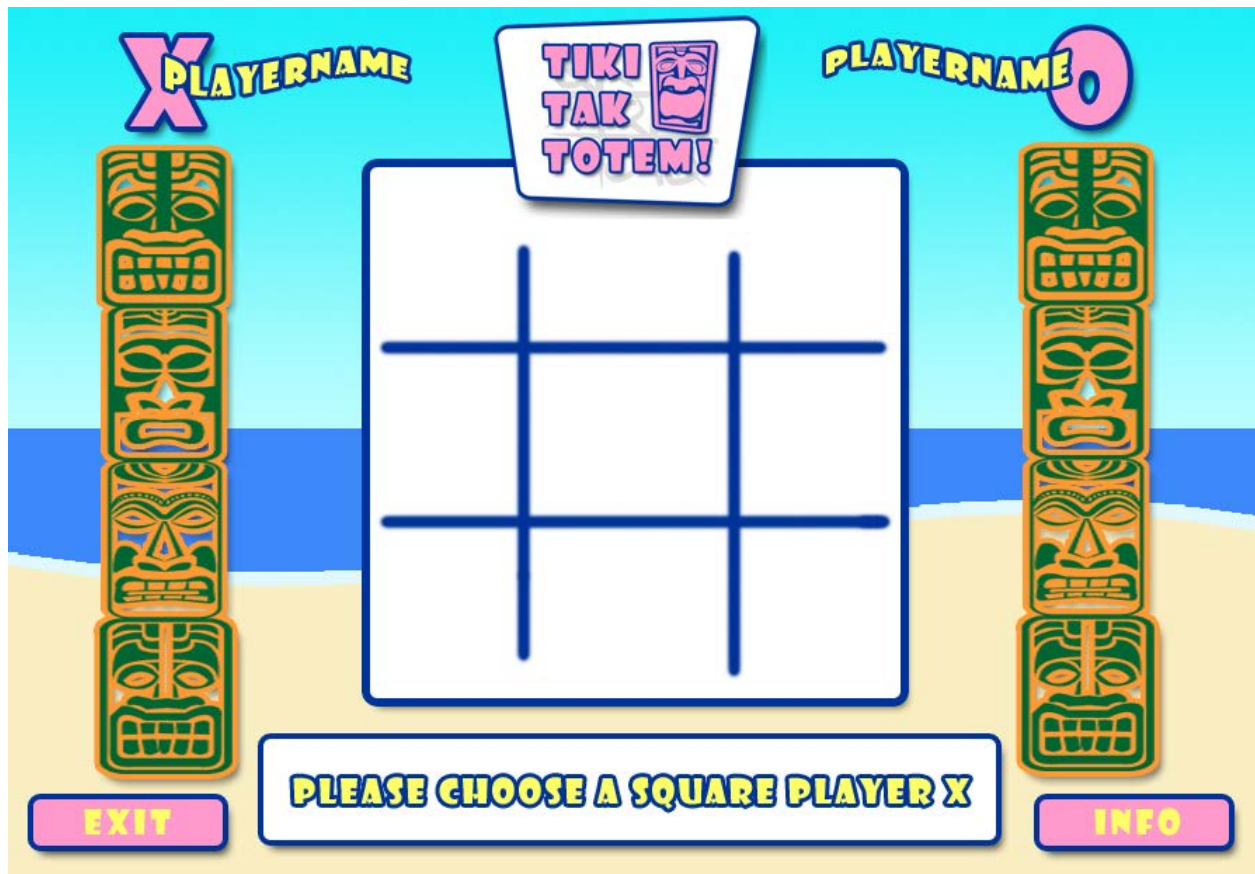


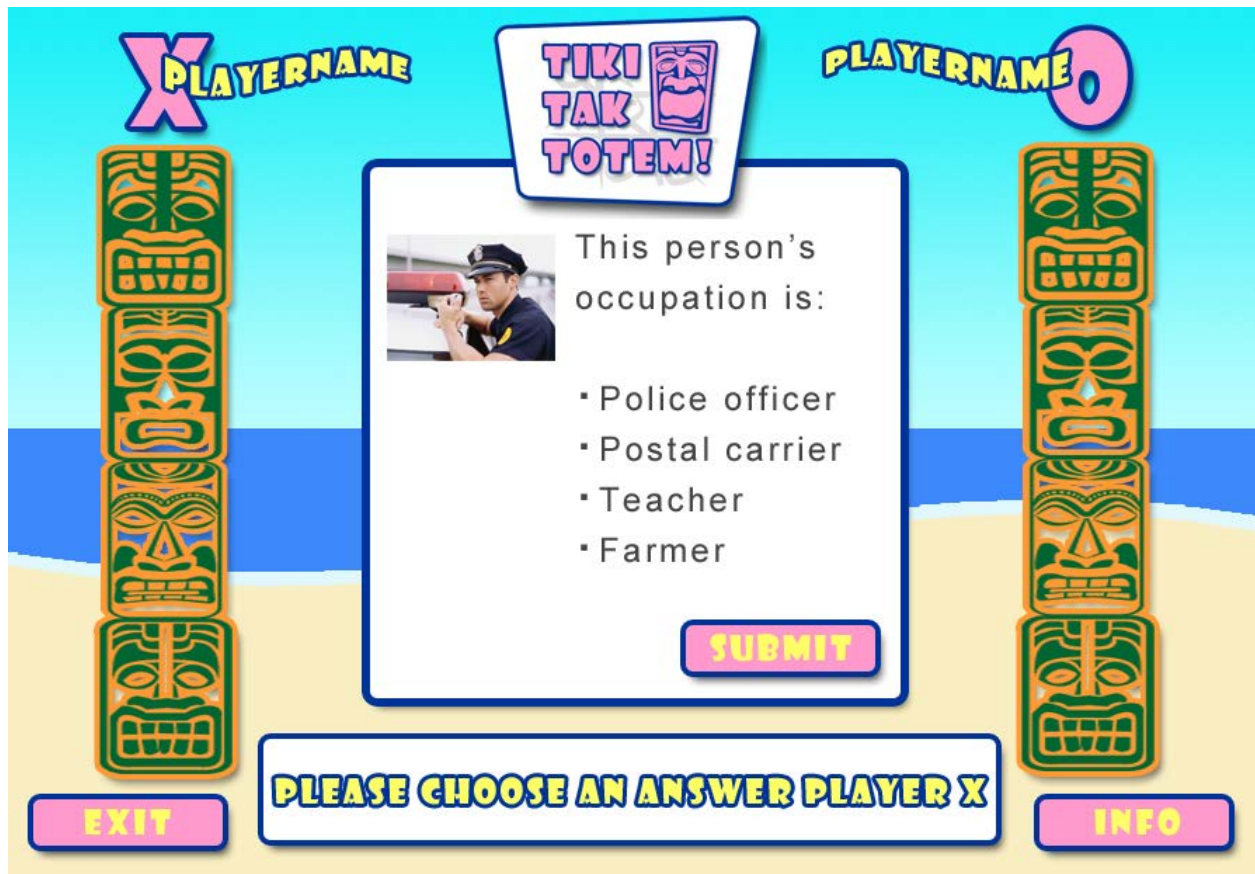


Mockups

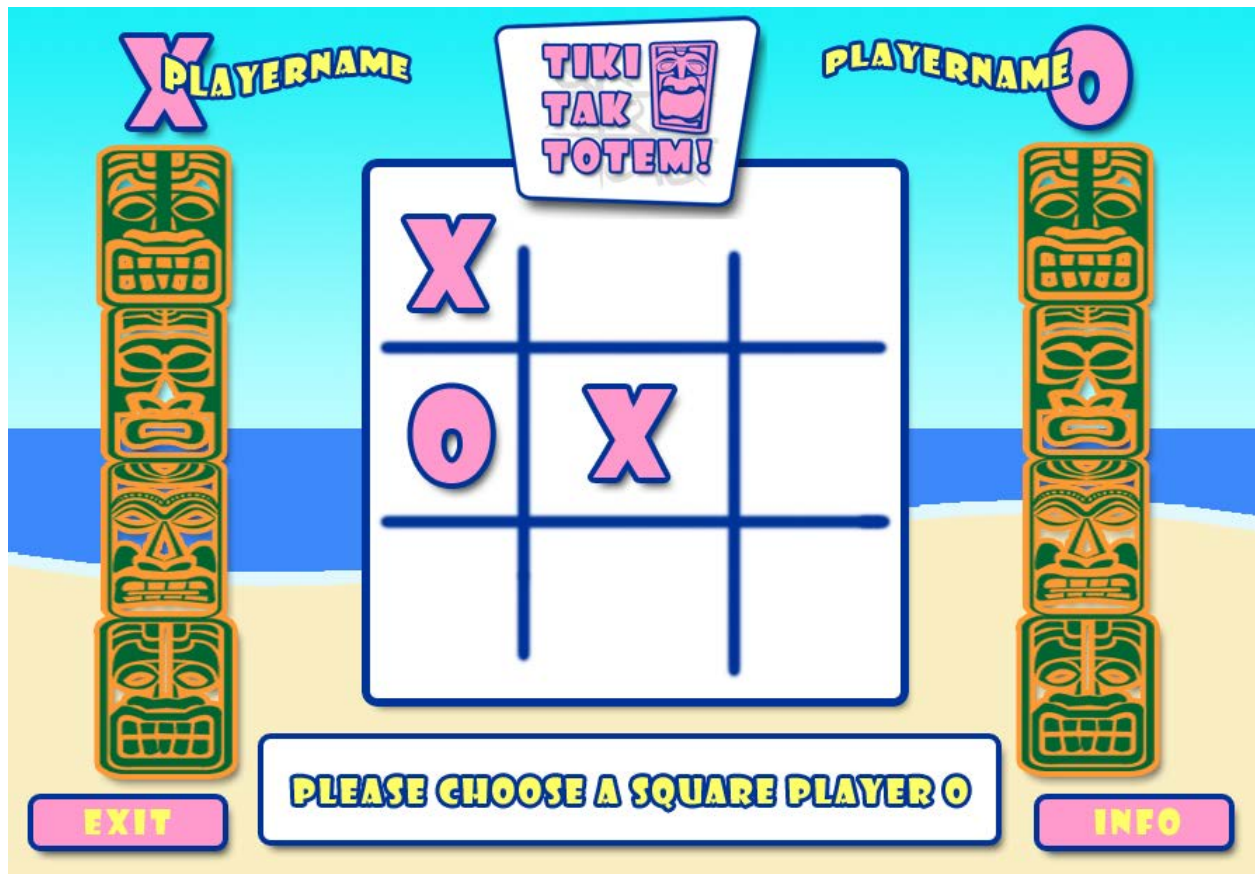












Analysis

The goal of the project was to design an educational play experience intended to mediate social interactions between autistic children and neurotypical children ages 6 to 12 years. Additionally, the project was meant to focus on the critical social and language skills needed by the target group, while not being branded as an “autism” product. Overall, the designed experience was supposed to be fun, interesting, and beneficial for both ASD children and their neurotypical peers. Because of my limited knowledge and experience in the ASD realm, I decided to target the experience to children with high-functioning autism or Asperger syndrome. I simply felt that the amount of research required for me to design an effective play experience for children with low-functioning autism – and still make it appropriate for neurotypical children – would exceed the scope of the project.

I decided that a browser-based game would be appropriate, since research indicates that computing applications have been successfully used to teach specific communication and social skills to autistic children. ASD children also tend to be relatively skilled at “responding to fixed visual cues such as pictures or written words” (Bernard-Opitz, Sriram, & Nakhoda-Sapuan, 2001, p. 378). Additionally, a study that compared vocabulary lessons presented by a teacher versus a computer found that autistic children were more motivated – and retained more information – when the computer was used (Grynszpan, Martin, & Nadel, 2005, p. 1419). Parents have also reported that computers improve learning rates for their autistic children (Bernard-Opitz et al., 2001, p. 378).

The format I decided to design was an interactive, two-player, tic-tac-toe-style game. Players select a square, and in order to get an X or an O, they must meet a challenge. I felt that the two-player format creates a social situation and leads to interaction between the autistic player and the neurotypical player. My research also indicated that the interactions that are inherent in such game play, such as turn-taking and peer prompting, have been shown to increase verbal interaction between autistic and neurotypical children. Further, the enhanced social skills gained from this type of interaction can carry over to other situations (Moore, McGrath, & Thorpe, 200, p. 220).

Another reason I chose the format I did was that it allows for an essentially unlimited variety and number of challenges. It is also highly customizable. A simple administrative interface would allow a teacher, parent, or researcher to enter challenges of their own construction. The wide variety of challenges that could be introduced into the game also makes it more appealing to both target groups. Children with high-functioning autism or Asperger syndrome tend to have well-developed vocabularies, but may have trouble understanding abstract social concepts (Grynszpan et al., 2005, p. 1419). The customizable format allows the game administrator to input communication challenges

that are appropriate for both players, while including social challenges that may be more geared toward the ASD player or that may even require prompting from the non-ASD player to complete.

I wanted the design to provide a fairly structured format for introducing social and language skills into the play experience. Social interaction between autistic and neurotypical children appears to be influenced by the relative structure of the activity, with more structured activities leading to greater interaction than less structured activities (McConnell, 2002, p. 359). Initially, I had some concerns that a play experience design for autistic children of a specific age range would only appeal to neurotypical children who were a bit younger. However, my research indicated that “higher peer initiation rates and more social interaction occurs when children with autism are paired with same-age versus younger typically developing peers” (McConnell, 2002, p. 359). This revelation led me to design a simple game format that could accommodate content tailored for both autistic and neurotypical children of the same age, rather than an experience that might be suitable for autistic children of one age and neurotypical children of a younger age.

The game format does afford opportunities to introduce some types of sensory reinforcers, such as animation and music or other sounds. There is research to indicate that a significant percentage of autistic children prefer sensory reinforcers to natural reinforcers (Bernard-Opitz et al., 2001, p. 382). Overall, I felt that this format and design could help autistic children develop collateral social and language skills while engaging in a play experience with a typically developing peer. This type of activity could serve to increase the autistic child’s social competence while also reinforcing the value of participating in social activities (McConnell, 2002, p. 361). Additionally, the variety of challenges that could be introduced into the game could address any number of social and language deficits common to autistic children while remaining engaging and enjoyable for their typically developing peers.

References

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