Vision Document

mmDragonTutor

Software for the Enhancement of Elementary

Communication of Children in the Autistic Spectrum

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Revision History			
Date	**Revision**	**Description**	**Author**
5/23/2011	1.0	Initial Version	Martin Hoffman Monica Hoffman
9/27/2012	1.1	Formatting was updated. Added Sections 2.5, 4, 6, 7, 8 and 9. Added Appendix A.	Martin Hoffman Monica Hoffman

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1 Introduction

This is the Vision Document for mmDragonTutor, Software for the Enhancement of Elementary Communication of Children in the Autistic Spectrum. This document describes the users of the system, the environment in which they work, key user needs, and alternatives to mmDragonTutor.

1.1 Purpose of the Vision Document

This document collects, analyzes, and defines high-level user needs and product features. Children with Autism need innovative tools for learning basic communication and daily skills; teachers and parents need intuitive, economical and effective methods to help their children reach their full potential. They all have different levels of computer expertise, and all children learn differently, so they need a product that is flexible and intuitive. This document contains the details of how mmDragonTutor will fulfill these needs.

1.2 Product Overview

One of the fundamental needs in the elementary education of autistic individuals is the ability to communicate. Using a computer based curriculum as a means to supplement early education has been shown to be very successful. However, autistic children encompass a very wide spectrum of needs that are not always met in traditional computer software. Additionally, costs of commercial software for children in the autistic spectrum are out of reach of most families.

This project will create an educational communication software program which can be configured to best meet the individual needs of the student. Using an iterative development process, the software will incorporate the unique abilities, preferences, and developmental levels based on literature studies and feedback.

The final product of this project will be available for public distribution without cost.

1.3 References

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2 User Description

The users of this system can be generalized into two groups, system administrators (parents, teachers, therapists, etc.) and users (students, children). System administrators will use the application to create learning lessons for the users, generate individual profiles for each user, and monitor user progress by using the application's reporting system. Software solutions currently available can be very costly or cumbersome to setup. They need a solution that is flexible, economical, and easy to use that can meet the needs of their student/child. Users (students/children) will use the application to improve their communication skills by using a flash card type system to match words, pictures, expressions, and sounds. They need a solution that can be personalized to their preferences and can be configured to their skill level.

2.1 User/Market Demographics

The main motivation for this system is to provide an inexpensive yet effective solution to help parents and educators improve the communication skills of their autistic children. Currently available software solutions are either not effective, low quality, or too expensive. Our goal is to provide free professional quality software to parents and educators to use as a tool to help their children learn communication skills in an adaptable environment that holds their interest.

2.2 User Profiles

There are three main types of users, students, parents, and educators. Each type of user will range from novice to guru with respect to computer knowledge. Regardless of technical savvy, all users will require the system to be flexible and configurable. Students are the main user of the application and will benefit most from it. Their definition of success will be when they start making connections between the objects they are matching in the application to objects in the real world. Parents and educators both serve as system administrators of the application. Their definition of success is the ability to setup individualized lessons for each student that contributes to their learning experience. The ultimate success will be when they see their child making real-world connections.

2.3 User Environment

Source	Constraint
Economics	• Software must be available at no cost to the parents and educators of ASD children.
System	• A minimum of a 500 MHz processor. • Microsoft Windows XP (service pack 3) or newer Microsoft compatible operating system. • Minimum of 256 MB RAM. • 500MB available disk space. • 1024x768 or higher resolution. • Keyboard and mouse devices. • Optional touch screen monitor. • Speakers for audio output. • Microsoft .NET Framework 2.0 or higher.
Technology	• Basic knowledge of the Microsoft Windows environment is necessary to configure the lessons and setup the visual and audio files.

2.4 Key User Needs

From the User (Student) Perspective

- Needs to be fun
- Drills must be consistent
- Must allow for repetition
- Need positive reinforcement – rewards
- Must have a goal
- Must keep the student's attention

From the System Administrator Perspective

- Need an intuitive interface so there is a small learning curve
- Ability to configure and modify to meet the user's needs
- Ability to track of progress of the user
- Ability to report on user's progress
- Ability to report on progress of multiple users (especially in a classroom setting)
- Easy to setup for multiple users

2.5 Alternatives and Competition

2.5.1 Competitor AES DT Trainer

Standard Institutional Bundle

(http://www.dttrainer.com)

Strengths

1. Reporting capabilities
2. Includes lesson content

Weaknesses:

1. Cost: $349
2. Bundled content is limited for children up to 9 years old
3. Unattractive user interface
4. Less configurable user interface

2.5.2 Competitor MouseTrial

www.mousetrial.com

Strengths:

1. Many modules (lessons) are available
2. Available as an on-line application

Weaknesses:

1. Cost: 1 year license ($30-$40) + content ($10 per module i.e. letters)
2. Very few configurable settings
3. Unable to include custom rewards
4. Only very basic performance data is gathered
5. Unable to configure visually configure the lesson (student pictures, personal likes, etc)

3 Product Overview

3.1 Product Perspective

Uniquely adapted for elementary communication of Autism Spectrum Disorder (ASD) children and highly configurable to each child's interests and learning style is what distinguishes mmDragonTutor from other computer based learning software.

3.2 Product Position Statement

Children in the autism spectrum have very unique requirements for a computer based learning program. Each child has a particular set of interests that will hold their attention and limits on how much information and time they can dedicate on each lesson. mmDragonTutor will provide a simple method of presenting elementary communications lessons that can be adapted to each these personalities of each child. ASD students will find that once configured, mmDragonTutor presents the lessons in a familiar and appealing environment.

For	**elementary ASD students**
Who	**lose interest in most computer-based software**
mmDragonTutor	**is a customizable environment**
That	**keeps the student engaged in the lesson**
Unlike	**other software that only offers a fixed lessons and a set environment**
Our Product	**allows the environment to be adapted to each students interests and learning style.**

3.3 Summary of Capabilities

Customer Benefit	Supporting Features
Adaptive to each students learning style	Configurable lesson drill layouts, rules, rewards, images, and sounds
Access to progress and success of each lesson	Reporting tools that show the progress and success of each child's lesson.
Low cost	Software is free for use.
Easy to configure	Simple menu setup
Easy to use	Provides sample goal of each lesson for the student to follow.

3.4 Assumptions and Dependencies

Assumptions	Dependencies
Software is free for use	Volunteers will maintain the software.
Software will be available to all students	Properly configured PC is available for use by all students
Users have basic PC knowledge.	Students are able to use the mouse and are able to left click in an object.

3.5 Cost and Pricing

mmDragonTutor will be free for use by students, parents, and teachers.

4 Feature Attributes

4.1 Priority

Priority is set by the development team based on interviews with stakeholders, in-depth knowledge of how the mmDragonTutor application works, and through personal experience. Priorities used for mmDragonTutor are as follows:

- Critical (C): Without these features, the mmDragonTutor application will not work. Stakeholder needs will not be met, and the application will be useless.
- Important (I): These features will cause a significant loss of customer utility. The application will still work and will still meet user needs, but it will be much less effective.
- Useful (U): Useful features are "nice to have." There will be no loss of stakeholder needs and no impact to application functionality.

4.2 Effort

The development team determines level of effort. The developers estimate more man hours for features with a high level of effort. Levels of effort for mmDragonTutor are listed below.

- High: Greater than two man weeks.
- Medium: One to two man weeks.
- Low: Less than one man week.

4.3 Target Release

Features categorized with a priority of critical or important are targeted for the initial release of the mmDragonTutor software.

5 Product Features

Feature ID	Feature Name	Feature Description
Design 01	Holds the student's Interest	GUI needs to contain images and sounds that interest the student.
Lesson 01	Each drill should maintain a consistent expectation	Drills will follow the same expected results to the student does not get confused.
Design 02	Handle repetition by the student	Repetitive inputs by the student will not cause any failures or unexpected results.
Design 03	Need positive reinforcement – rewards	Upon successfully completing each goal the student will be presented with a reward screen (video, audio, game, etc).
Lesson 02	Each drill has a defined goal	During setup of a drill, the goal or criteria for success can be defined.
Lesson 03	Must keep the student's attention	Each drill can be setup to each student's skill and interests.
Design 04	Must limit distractions from the goal	Each drill can limit the number and duration of rewards or number of choices.
Design 05	Need an intuitive interface so there is a small learning curve	An example of a successful goal can be displayed to show the success criteria
Setup 01	Ability to configure and modify to meet the user's needs	Each drill can be configured to meet the needs of the user

Reporting 01	Ability to track of progress of the user	Ongoing records of progress will be available to the teacher and administrator.
Reporting 02	Ability to report on user's progress	Progress of each user will be maintained and reported.
Reporting 03	Ability to report on progress of multiple users (especially in a classroom setting)	Teachers can obtain reports for all users from a single request.
Setup 02	Easy to setup for multiple users	User setup can be replicated to multiple users.

6 Exemplary Use Cases

Student Login	
Actor(s)	Student
Description	This use case describes the steps a student would follow to login to their lesson plan selections.
Flow of Events	Basic flow begins when the student is presented with a grid of student pictures and names. The student selects their own picture by double clicking on it. The student is presented with a password field. The student enters their personal password, followed by enter. If password is correct, the student is presented with the lesson plan selection screen.
Alternate flow	When the student enters the wrong password, the system will audibly beep and will return them to the login screen.
Pre-conditions	The mmDragonTutor application is initiated and the login screen is open. The administrator has set up a student account and has assigned lesson plans to the student.
Post-conditions	On leaving this use case, the student is presented with a grid of lessons assigned to them.

Student Opens a Lesson	
Actor(s)	Student
Description	This use case describes the steps the actor would follow to open a Lesson.
Flow of Events	Basic flow begins with the actor at a mmDragonTutor Lesson Selection screen. The actor selects the desired Lesson by clicking on the Lesson image. The Lesson window will appear.
Alternate flow	
Pre-conditions	The actor is at the Student Lesson Selection screen
Post-conditions	On leaving this use case, the actor is presented with the selected Lesson.

Administrator Login	
Actor(s)	Parent, Educator, Administrator
Description	This use case describes the steps a parent, educator, or administrator would follow to login to the administrative section where changes can be made to a student's account.
Flow of Events	Basic flow begins when the user is presented with the mmDragonTutor login screen. The actor clicks on the admin button. The actor is presented with a password field. The actor enters the admin password, followed by enter. If the password is correct, the actor is presented with the admin screen.
Alternate flow	When the actor enters the wrong password, the system will audibly beep and will return to the login screen.
Pre-conditions	The mmDragonTutor application is initiated and the login screen is open.
Post-conditions	On leaving this use case, the actor is presented with the admin screen.

Create profile	
Actor(s)	Parent, Educator, Administrator
Description	This use case describes the steps a parent, educator, or administrator would follow to create a new student profile.
Flow of Events	Basic flow begins when the actor is presented with the tabular admin screen. Tab order is Student, Lesson Plans, Layout, Cards. The default tab is the Student tab. The actor clicks the "Create New User" button. The actor is presented with the user fields: first name, last name, birthday (optional), picture, lesson plans, rewards, and current student. The actor enters first name, last name, and birthday by entering data into the text boxes. To add a student picture, the actor clicks on the "Browse" button to browse to the desired picture. The path to the picture is saved into the text box. To assign lessons to the student, the actor clicks on the "Select Lessons" button to open a window listing available lessons. The actor clicks the checkbox next to each lesson to be assigned to the new student and clicks the OK button when complete. If desired, the actor may change the difficulty level for the student, but the default is level 3. The actor clicks the "Select Rewards" button to open a window listing available rewards for the student. The actor clicks the checkbox next to each reward to be used for the new student and clicks the OK button when complete. The actor is returned to the admin display. The "Current Student" checkbox is checked by default. This notifies the mmDragonTutor program that this student's picture should be displayed in the student logon screen. When the actor has filled in all required data, they click the "Create" button to create a new student.
Alternate flow	When the actor does not enter all required data, the actor is notified that required data is missing and must be entered before the new student can be created. The actor is returned to the "Create New User" screen to complete student registration.
Pre-conditions	The mmDragonTutor application is initiated and the actor has logged into the admin screen.
Post-conditions	On leaving this use case, the user data is written into the mmDragonTutor database, and the actor is presented with confirmation that the new student was added. The student is, by default, an "active" student in the database.

Create lesson plan	
Actor(s)	Parent, Educator, Administrator
Description	This use case describes the steps a parent, educator, or administrator would follow to create a lesson plan for a student.
Flow of Events	Basic flow begins when the actor is presented with the tabular admin screen. Tab order is Student, Lesson Plans, Layout, Cards. The actor clicks the lesson plan tab. The actor selects "Create New Lesson Plan". The actor is presented with the lesson plan fields: name, browse for layout, and add cards. The actor enters a name for the new lesson plan in a text box field. To select the layout for this lesson, the actor is presented with a list of available layouts to choose from. The actor selects the desired layout. To select the cards for this lesson, the actor is presented with a list of available cards or card groups to choose from. The actor selects the desired cards or groups of cards. The lesson plan is created, saved in the mmDragonTutor database, and the user is returned to the Lesson Plan tab on the administrator window.
Alternate flow	
Pre-conditions	The mmDragonTutor application is initiated and the actor has logged into the admin screen.
Post-conditions	The mmDragonTutor database is updated with the new layout, which is then available to be assigned to students.

7 Other Product Requirements

7.1 Applicable Standards

Microsoft Windows XP (service pack 3) or newer Microsoft compatible operating system is required. mmDragonTutor was built with Microsoft Visual Studio 2010, so Microsoft .NET Framework 2.0 or higher is necessary to run the application. The framework will be delivered with the installation.

7.2 System Requirements

A minimum of a 500 MHz processor with a minimum of 256 MB RAM is recommended for mmDragonTutor installation. At least 500MB available disk space is recommended. Screen resolution should be set at 1024x768 or higher. For usage of audio and video, speakers are necessary for sound.

7.3 Licensing, Security, and Installation

No copyright or licensing is required for mmDragonTutor. All peripheral applications are freeware, and all sound, video, and pictures are public doman.

7.4 Performance Requirements

mmDragonTutor is not expected to cause undue load on the host system. However, if standard system recommendations are not met, there could be possible issues with the user interface not updating as expected.

8 Documentation Requirements

8.1 User Manual

A Portable Document Format (PDF) version of the mmDragonTutor user manual will be delivered with the software package. It will be accessible from within the application or as a stand-alone document. In the event the user does not have an application to view PDF documents, the current version of Adobe Reader will be included in the installation package, along with a link to the Adobe Reader download.

The mmDragonTutor user manual is expected to be no longer than 30-40 pages. The main purpose of the user manual is to serve as a tutorial to assist users and system administrators in logging into the application and describe how to add, edit, and deactivate/delete user profiles, lesson plans, and cards. It will describe the process of creating a new layout, new lesson plans, and new cards, and will detail the steps to generate reports for a user. It will explain how information is collected on each student, and will demonstrate how that information is reported to the administrator. The user manual will also teach the administrator how a student may login to their own profile and start a lesson.

Default lesson plans and layouts will be described in the user manual, as well as default passwords. The manual will contain a step-by-step guide for quickly starting up and using the application, as well as more detailed steps for advanced usage. Any known issues or defects will be listed in the user guide and the read me file, as well as instructions on how to recover from known errors.

8.2 Online Help

The first release of mmDragonTutor is not expected to contain online help because an Internet connection is not required to run this application.

8.3 Installation Guides, Configuration, and Read Me Files

The mmDragonTutor installation guide will contain step-by-step instructions on how to install the application and any required peripheral applications such as Adobe Reader. For vendor specific applications, the installation guide will refer to the vendor specific manuals whenever possible. System requirements and recommendations will also be detailed in this document. The installation guide will be provided in PDF format and should be no longer than 1-3 pages. A read me file will be provided to inform the user about any compatibility issues, known defects and workarounds, and minimum system requirements for mmDragonTutor.

9 Glossary

ASD	Autism Spectrum Disorder
GUI	Graphical User Interface
PDF	Portable Document Format

10 Appendix A: Baseline Feature List for mmDragonTutor

ID	Feature	Priority	Effort	Target Release
2	Drag & Drop capabilities	C	M	1.0
4	Make Question and Answer GUI areas	C	H	1.0
6	Make Q&A cards associated with 1+ keywords (keyword list)	C	M	1.0
7	Allow sounds to be played on question cards	C	M	1.0
8	Allow goals to be defined (with defined reward)	C	M	1.0
9	Use Icon "cards"	C	L	1.0
11	Use Microsoft .NET for the Windows platform	C	L	1.0
12	Only allow acceptable image formats (gif, jpeg…)	C	L	1.0
13	Maintain a list of keywords that are used to define all icons/cards (keyword list)	C	M	1.0
16	Each card can be used as a Question or Answer card	C	M	1.0
18	Cards will have 1+ keywords defined	C	L	1.0
19	Generate a file structure to track files, sounds, pictures….	C	M	1.0
22	Reaction time to user inputs shall be minimized	C	M	1.0
23	Application shall not be a processor hog	C	M	1.0
24	Application shall run on a minimal computer system	C	M	1.0
26	Compatible with standard mouse and keyboard	C	L	1.0
27	Application shall run for a minimum of 10 hours (1 school day) without failure.	C	L	1.0
3	Graphical setup of each lesson	I	H	1.0
5	Let cards be created with user pictures	I	M	1.0
10	Track and record user performance	I	H	1.0
15	Configure the # positives before the "big" reward	I	L	1.0
17	Use data file to track user setup	I	H	1.0
21	Application will handle "stimming" type of inputs	I	L	1.0
28	Easy to modify and change settings	I	M	1.0
30	Deliver with predefined sample Q&A area setups	I	M	1.0
31	Create sample templates	I	M	1.0
32	Deliver an online user guide	I	H	1.0
33	Deliver an initial baseline for pictures/rewards	I	M	1.0
1	Easily set volume level	U	L	2.0
14	Administrator/ User can setup the desired reaction to mouse click or drag for each user.	U	M	2.0

ID	Feature	Priority	Effort	Target Release
20	Create a user profile (name, age, birthday…)	U	M	2.0
25	Compatible with touch screen	U	H	2.0
29	Allow text setup for advanced administrators	U	H	2.0
34	Allow an optional password protection	U	M	2.0