

Team GAMED

Presented by
The Attention Deficit Hyperactivity
Disorder-Giftedness Design Team

EDIT 752 Spring 2008

- ### Where We Started
- Twice-exceptional students are not served by current schooling situations
 - à A mobile device to assist them in and out of the classroom
 - Currently available mobile devices did not fulfill our needs
 - à Develop a new multi-functional device

- ### Characteristics of the Children
- Easily distracted
 - Inconsistent academic performance
 - Extreme tendencies—between hyperfocused and completely unfocused
 - Can be very critical of themselves

- ### Characteristics of the Children
- Socially, they tend not to fit in with their peers; relate better to adults
 - Comfortable with technology
 - Do not do well in traditional classroom environments



- ### Goals for Spring 2008
- Two cycles formative design evaluation
 - First cycle to focus on all groups of stakeholders
 - Gather more details about our target audiences
 - Determine the utility of the device
 - Second cycle to focus solely on students
 - Determine if the interface of the device is useful in practice

Questions

- When, or for what purpose, would our target audiences use the device the most?
- What features are most important to our target audiences?
- What would be the preferred source(s) of input? (i.e., stylus, keypad, voice)
- In terms of learning curve, how difficult is it to learn to use this device?
- Can users foresee using this device on weekends and/or out of the classroom environment?

Methods to Collect Data – Online Survey

Data was collected through on-line surveys and interviews.

- Focused on secondary target audiences
- Reviewed a [website](#) describing the features of the GAMED device and interactive wireframes
- Completed brief online survey assessing the features and utility of the proposed device

Methods to Collect Data – Interviews

Methods to Collect Data

Contextual Inquiry

Questions	Answers	Guiding
<p><i>"Tell me a little about your favorite things. I like Mario games, robots, and video games. Can you describe some of the fun things you do in school?"</i> if they have a hard time thinking of what to say you can suggest- <i>"projects you have done or activities- games"</i></p> <p><i>I go to Art class, I have a very nice teacher... And I also like Fridays at the school. I get to go to library and on Fridays they serve Pizza!</i> <i>"How about the parts of school that you don't like."</i> if they have a hard time- <i>"Say... spelling tests? Being quiet? Sitting for a long time? Homework?"</i></p> <p><i>Math! I'm a pretty good student at spelling. Writing? Maybe. "Are there any parts of school that are easier for you than for the other kids?"</i> if they have a hard time- <i>"Science -Social Studies- Math"</i></p> <p><i>Well I really do find reading and social studies very easy as well as fun in social studies</i> <i>"What is the best part of that/those?"</i> <i>Studying the history of wars.</i></p>		

References:
*Contextual inquiry is the technique that helps you understand the real environment people live in and work in, and it reveals their needs within that environment." (Kieras, 2002, p. 169)
Kieras, M. (2003). Observing The user experience. New York, NY: Morgan Kaufman.
*Contextual inquiry is more a discovery process than an evaluative process, more like learning from testing." Horn, J. (2003). Contextual Inquiry ¶ 1. Retrieved April 22, 2008 from the Usability methods toolbox Web site: <http://poom.best.vix.net/usability/>

Ethnographic Study / Field Study

Can you help me by "thinking out loud" as you go through the screens. I will ask you questions as you go along.

Interviewer guide: Ask: Encourage think aloud and let them go through all the scenarios that follow each suggestion. Eliminate suggestions if the student automatically completes the steps in a suggestion.

Interviewer's Observations: Let's go on communications. I want to see it can record anything. Oh! So it's IM! HMMMM. (Agreed that it was good to have) It's really nice! (Agreed that it is good to have comments from the teacher.) Let's see the applications because I want to see what's in there. um, applications again, hhm, Calculator! (He used both the home button and back button to get where he wanted to go. He pushed buttons without hesitation and without asking for directions, seemed to feel successful with al except the calendar link.) What does input do? Thumbo key! (It was explained that input was just the way to get things into the computer) Ok, let's go to back, back, back, hit home. Let's see the organizer. (He hit several buttons without luck.)

References:
*Observing users in the field is often the best way to determine their usability requirements." Horn, J. (2003). Ethnographic study/field observation. ¶ 1. Retrieved April 22, 2008 from the Usability methods toolbox Web site: <http://poom.best.vix.net/usability/>

Usability Tests

For surveys:

- As a basic usability test, participants reviewed a [website](#) describing the features of the GAMED device.

For interviews:

- Students interacted with prototype and responded to questions about the ease of use.
- Students were asked to explore device features and accomplish some tasks.

Interviewer: What should you click to see what is happening on April 3rd?
Interviewee: Well that could be under here or under assignments in the current way you're doing things. I went to assignments and went to date, but if you combine them into two you wouldn't have this same thing twice. Just having one button that says "Assignments/Organizer" just makes sense.

References:

- "Usability testing is the best at seeing how people perform specific tasks, it should be used to examine the functionality of individual features and the way they are presented to the intended user." (Kunavsky, 2003, p. 240)
- Kunavsky, M. (2003). Observing the user experience. New York, NY: Morgan Kaufman.

Methods to Analyze Data

- Video taped and recorded interviews
- Transcribed interviews
- Performed qualitative coding for themes in the data
- Analyzed themes for design purposes

Example of Qualitative Coding

Possible Problems

Preferred Application

Input

Alerts

Ease of Use

Appearance

Analysis of Themes for Design Purposes

Code	Text	Code	Text	Code	Text	Code	Text	Code	Text
Possible Problems	...the screen is not clear enough...	Preferred Application	...I would like to see more options...	Input	...the buttons are hard to press...	Alerts	...I need more notifications...	Ease of Use	...it's a bit confusing to use...
Appearance	...the layout is cluttered...	Alerts	...I need more notifications...	Input	...the buttons are hard to press...	Preferred Application	...I would like to see more options...	Possible Problems	...the screen is not clear enough...

Parent and Teacher Demographics

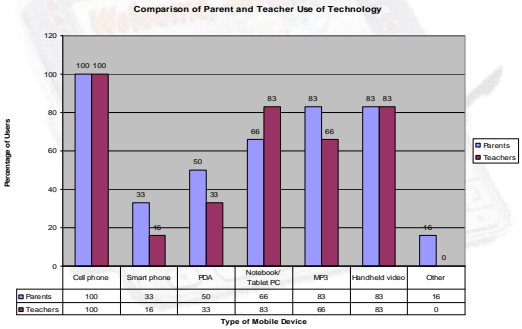
- 0%** of parents, **16%** of teachers had seen a mobile device used in educational settings
- NO ONE** had seen a device with all of the GAMED features proposed!
- 100%** of parents and teachers worked with a student diagnosed with ADHD.
- 83%** of parents and teachers stated that the student had also been identified as intellectually gifted.

Parent and Teacher Demographics

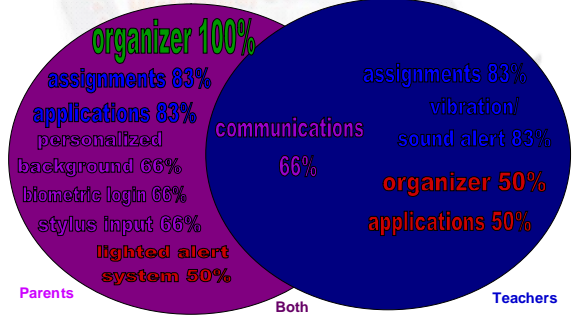
THE PROBLEM: Most school districts employ a "one label per student" model when developing educational programs.

Martin, A. (2006). The 2e dilemma: Understanding and educating the twice-exceptional child. Retrieved April 20, 2008 from the Twice-Exceptional Newsletter web site:
<http://www.2enewsletter.com/Understanding%20and%20Educating%20the%202e%20Child.htm>

Parent and Teacher Survey Input: Use of Technology Devices



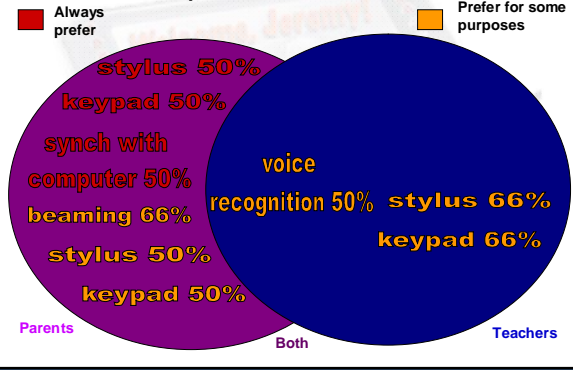
Parent and Teacher Survey Input: Evaluation of Features Rated As "Very Useful"



Parent and Teacher Survey Input: Evaluation of Possible Features

- Considerable agreement among parents about features they considered helpful.
- Less agreement among teachers.
- A majority of teachers and parents [66% of both groups] considered a communications feature (i.e., email, chat, and conferencing) important.
- Parents rated features related to **productivity** and **organization** very highly.
- **Teachers** rated features related to **attention**, **productivity**, and **organization** highly.
- No responses of "Not Helpful" for any proposed feature.

Parent and Teacher Survey Input: Input Preferences



Parent and Teacher Survey Input: Input Preferences

- Stylus, keypad, and voice recognition received high ratings as available input options by **both** parents and teachers.
- There was greater agreement among parents than among teachers about input options.

Parent and Teacher Survey Input: Appearance Preferences

- Parents and teachers **both** felt that the **ability to personalize the device** was important.
 - Some teachers expressed that the tactile stimulation of a specialized backing might be important.
- "love the back side with so much textile stimulation" (See student comments.)

Parent and Teacher Survey Input: Opinions of Possible Features

- Parents and teachers **both** expressed that a **means of locating a misplaced device** and **multiple modes** of importing and exporting data were important.
- Teachers expressed greater interest in multiple user profiles.

Parent and Teacher Survey Input: Opinions on Redundant Access

- **100%** of parents, **66%** of teachers support

“The more **flexible** the device, the **easier** it is **to use**. It is helpful that you don't have to stop and think how to access a particular feature, knowing that there are different ways of getting there makes it **more likely that it will be used.**”

Usability Test – Wireframes

- Created high-fidelity wireframes to simulate using device
- Added activity functionality for usability testing

Student Interview Materials

- Interview script
- Laptop with interactive wireframes
- Digital audio recorder
- Video camera
- Tripod
- A variety of prototypes
- Several styluses
- Thermometer response gauge



Student Insight




T	5 th grade	Male	ADHD & Gifted
J	5 th grade	Male	ADHD, Gifted, & LD
A	5 th grade	Male	ADHD & Gifted
S ₁	7 th grade	Female	Honors classes, LD, ADD tendencies
S ₂	9 th grade	Male	ADHD, Gifted, & LD

Preferred Input

3	Voice input
2	- Recording - Dictation
3	Stylus
3	Beaming
2	Touch screen
2	Typing


Appearance

- Size-
 - 4- Prototype good
 - 2- Fit in a pocket
 - 2- Small screen
- Backing – very personal
- **Interviewer: “When you say rubberized will it be jell like this or harder?”**
- Video [clip.wmv](#)



Features

- Alerts
 - Likes and dislikes
- Features
 - Icons with words,
 - Sliding touch screen,
 - Internet research,
 - Synchronization among devices,
 - Portability,
 - Screen personalization



Preferred Application

5	Organization
3	Homework reminders & Organization
2	E-mail
2	Research
2	Notes with Stylus

- Strong opinions against using it for
 - Math
 - Long assignments

Ease of Use

5	No help needed after training
3	“Easy to use... exciting!”
2	Some things – confusing
1	Most – straightforward

Suggestions

- Options with input
- Combine Assignments with Organizer
- Put Internet in Applications
- Delete 2nd application section
- External keyboard
- Dictionary and spell check
- Handwriting recognition
- Nettekker—Adult controls on Internet
- Alerts for teacher—inappropriate usage
- Don't try to hide learning in math games

Reactions from Kids

“I would definitely use this device!”

“Kids would love this device!”

“You know, this comes out, will you PLEASE, PLEASE give me one?”


“It would rock!”

“When this comes out, will you PLEASE, PLEASE give me one?”

“I like how simple it will probably be in the end.”

“I like how simple it will probably be in the end.”


Data-Driven Design Changes – Round 1



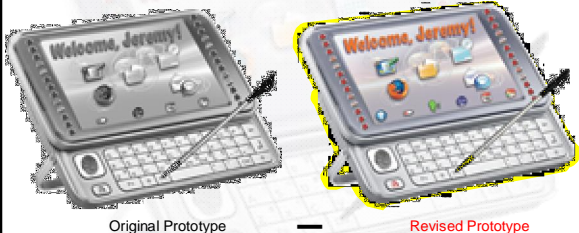
“I like the squishy back, that’s awesome. I haven’t really seen any devices with an interesting back or texture. It kind of keeps you interested.”

Data-Driven Design Changes – Round 2

“...A lot of devices have a little question mark where it says Help. Could you have that and click on that to get help, like an instruction manual or something?”

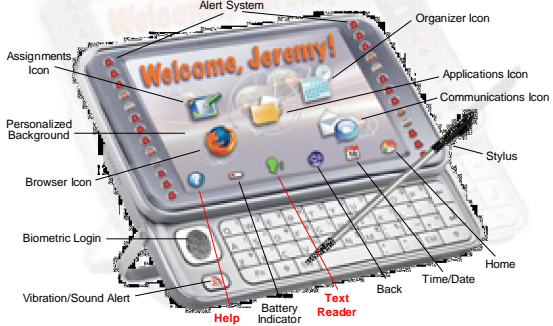


Revised Layout and Visual Design Front View




Original Prototype = Revised Prototype

Revised Layout and Visual Design Front View



Alert System, Organizer Icon, Applications Icon, Communications Icon, Stylus, Home, Time/Date, Back, Text Reader, Battery Indicator, Help, Vibration/Sound Alert, Biometric Login, Browser Icon, Personalized Background, Assignments Icon

Revised Layout and Visual Design Back View



On-Off Switch, Stylus Holder, USB Port, Tactile Stimulation, Kooshi Backing

Recommendations for the Future: Hardware

- Cord attaching stylus to device
- Device locator
- Personalization options (faceplate, tactile backing)
- Varying options for alerts
- Headphone jack
- Memory expansion
- Protective case
- Charger/ power adapter
- External keyboard, mouse
- Belt clip attachment

“Well, maybe like headphones if it’s reading something aloud and you don’t want to the whole world to hear it.”

Recommendations for the Future: Software

- Spelling and grammar check
- Spelling prediction
- File transfer software
- User manual
- Calculator
- Specialized strategies for twice-exceptional children



Any Questions?

