Google Glass for Education

A mobile usability study of a responsive instructional website

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March 17, 2015
Where are you?

Please click on your location using the button indicated on your tool bar.
have you worn Google Glass?

please select your answer using the button on your toolbar

- Nearly 20% of US internet users intend to purchase a wearable device in 2015
- In November 2014 estimates show wearable device sales worldwide rising 32% between 2013 and 2014
Google Glass for Education

Thank you for participating in this usability study and for supporting research at the College of Education, University of Hawaii at

mobile usability study

create & evaluate the ease of use & effectiveness of an instructional website and improve user satisfaction through iterative usability testing

URL: eLearn.Glass
What do you think is the most important issue facing educators?

“Having worked with educators in all sorts of educational institutions, one of the most important issues facing educators is understanding how to integrate technology into their teaching.

New students and learners are coming into traditional classrooms with a different set of skills and expectations around using tech, and instructors are pressed to keep up with new trends without sacrificing pedagogical practices that have worked for them in the past.”

—Billy Meinke, UH Manoa, ETEC Alumni

source: https://coe.hawaii.edu/about/getting-know-us/faculty-student-profiles/2013/09/billy-meinke-etc-alumni-creative%20commons
target audience

educators from the Google+ Community—Google Glass in Education & others interested in integrating technology into their practice

- technically skilled
- highly motivated early adopters
- receptive to a community of practice
- passion for professional development
- English-speaking
- all ethnicities
- located worldwide
- over 18 years of age
technology

3 areas of focus

- the device: head-mounted display
- website design for mobile learning
- iterative usability testing
Is Google Glass Poised To Become The Betamax Of Wearables?
by Kaila Colbin, February 20, 2015, 11:04 AM

Flaws in Google Glass, proving wearable technology can fail
THE AUSTRALIAN | FEBRUARY 20, 2015 12:00AM

Google Glass Failed Because It Just Wasn’t Cool
by Umair Haque
January 20, 2015

Google Glass Failed Because It Just Wasn’t Cool
by Umair Haque
January 20, 2015

Death Greatly Exaggerated
As a consumer device, Google Glass is indeed dead—but only temporarily. In late January, the

Google already seeding early next-gen Google Glass prototypes to select partners

MedCity News
Telematic business tests Google Glass with first responders and ERs for acute care
February 20, 2015 11:55 am by Stephanie Baum | 0 Comments

Healthbox accelerator grad Third Eye Health sees an

MEDCity News
Telemedicine business tests Google Glass with first responders and ERs for acute care
February 20, 2015 11:55 am by Stephanie Baum | 0 Comments

Sorry, But Google Glass Isn’t Anywhere Close To Dead
CADE METZ | BUSINESS 02.09.15 6:00 PM

Why Google Glass Broke
FEB. 4, 2015
This is a story that involves intrigue, a futuristic wear

Obituary: Google Glass 2011-2015
DUNCAN RILEY | JANUARY 15TH

Google Glass.
Born 2011 at Google X Lab, Mountain View, California.
Died; January 15th, 2015
Mountain View, California.
Glass at Work—Augmedix

Augmedix uses Google Glass to seamlessly push information to most major Electronic Health Records systems and to verbally query information from them. Physicians reclaim time and energy, so they can focus on what matters most -- caring for patients.
Brain Power LLC builds software & hardware to transform Glass into a neuro-assistive device. Their tools help children, and their families & schools, manage the challenges & features of Autism.
What is the Google Glass Explorer Edition?
Google Glass Explorer Edition

- Bone Conductive Transducer (BCT) Speaker
- Power Button
- Battery Capsule

Developed by Google’s Project Glass research team

Wearable computer with optical head-mounted display (HMD) or heads-up display (HUD) intended as a ubiquitous computer

Operated through touch or hands-free voice commands

Released to an invited group of developers named Google Glass Explorers in April 2013

Developer model made available to the public in May 2014
voice activation

ok glass, google...
take a picture
record a video
hang our with...
get directions to...
video recording
first-person, point-of-view perspective
distance education
augmented reality

field trips

"White House Science Fair" by NASA/Aubrey Gemignan May 27, 2014 (CC BY-NC 2.0)
Broadcast Live Livestream

Video lessons can transform learning. Flipped classrooms. Field trips. Demonstrations. All can motivate and inspire learning. Record for later viewing or stream them live. This app is available for mobile devices.

Source: http://new.livestream.com
mobile technology facts

As of January 2014:

90% of American adults have a cell phone
58% of American adults have a smartphone
42% of American adults own a tablet computer

source: Pew Internet Project, 2014

mobile video:

mobile phones and tablets accounted for a combined 30% share of digital video views worldwide in Q3 2014, a quarter-over-quarter increase of 20%.

source: eMarketer, 2014
what is usability?

- A form of human-computer interaction research
- User-centered evaluation method
- Looks at the ease of use (usability) of a product

Source: Dr. Matthew Schmidt, UH Manoa
usability testing

“Every time a person has a great experience with a website, a web app, a gadget, or a service, it’s because a design team made excellent decisions about both design and implementation—decisions based on data about how people use designs. And how can you get that data? Usability testing” (Chisnell, 2009)."
WordPress website optimized for mobile delivery, compatible across devices, responds to user actions, and automatically and dynamically reorganizes its layout for the best user experience.

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web-based instructional modules optimized for mobile devices providing instruction in the fundamentals of operating Google Glass, a head-mounted display, to record & stream video, integrate augmented reality, and explore curated resources for educational use.

m-learning modules
multimedia

concepts presented visually—many in high quality short (1-3 minute) videos
Responsive web design enables website or web application to re-flow, reorder and adapt to different screen sizes and resolutions.
responsive web design

- adapts the content, design, navigation, and method of interaction to deliver the same comfort and usability across devices
- cross-platform & cross-browser design
- multi-device functionality
- one website instead of having two (another just for mobile)
- single URL
- low cost
we’re outnumbered!

it’s a multi-device world
design for mobile first
challenges of mobile design

- tiny screen sizes
- variable screen widths
- touch screens
- difficulty of typing text
- physical environments vary
- variable connection speeds

source: Jenifer Tidwell, Designing interfaces, 2010
usability in context

- design to meet user needs
- each user holds their mobile devices differently
- users shift & change the way they work with their phones
- they touch the screen in different ways to do different things with their devices as they change tasks and context
designing for mobile means designing for touch

- users prefer to touch the center of the screen, even on larger tablets
- primary content and interactive area placed in the middle of the page/screen is optimal
- place key actions in the middle
- secondary actions along the top & bottom
- remember: fingers are opaque & can get in the way
- make room for fingers around targets
- leave room for gestures & scrolling
designing for touch

the accuracy zone—green area:
- area where people touch their mobile device screens most accurately
- where people are confident at tapping & where they wish to view content
- place key content & primary controls in the center, then check spacing with the accuracy dots

download at source: 4ourth.com/TouchOverlay/

the accuracy dots:
- set of representative touch sizes
- to test any touch target, position overlay over the target
- users will make accidental taps if any other touch target is within that circle
- use the size of the circles to make a grid to guide your spacing
designing for touch

mobile screenshot

touch zone (green)
touch accuracy (size)

home

nav

touch overlay

video
drop panels

back

next

Source: 4ourth.com/TouchOverlay/
mobile user interface

- sticky navigation
- stacked navigation (drop-down)
- focus on hierarchy

- minimalist approach
- simple interface elements
- visuals are sharp & clean
- white space for touchscreen
- flat design “almost”
- easy to understand & use
areas of evaluation

- ease of use (website)
- design, layout, & attractiveness
- learnability
- ease of use on mobile device
- user satisfaction
methods

usability is a key area of research in m-learning due to its profound effect on its success (Chang, 2006).

recruitment
- email flyer
- telephone
- six participants

two rounds of usability testing
- revisions made after each

moderated usability testing
- concurrent “think-aloud” protocol
- follow task scenarios
- verbalize thoughts in real-time
testing instruments

Qualitative Data
- Think Aloud Protocols
- Remote Google Hangouts
- One-on-One
- Observation
- Interviews

Quantitative Data
- Surveys (Pinnion)
- WordPress Plugin:
  inspectlet Heatmaps
  inspectlet.com
remote usability test

HANGOUTS

Glass in Education
Exploring Innovative Technologies in the Learning Environment
apple airplay

mirror iPhone screen to computer wirelessly
install AirServer

your computer becomes a receiver for AirPlay & displays your mobile screen
record activity with iPad

Recording Hands & Smartphone on iPad
Overhead Gooseneck iPad Holder

AirServer Receiver
AirPlay Phone to Laptop

Screenshare Google Hangouts

Screencast with Camtasia

the lab
record hand activity on mobile device during usability test
inspectlet—plugin  screen capture heatmaps  inspectlet.com

User I.D.  Platform  Screen Size  Date & Time

Browser

Clicks = 8
Trying to open drop-down panel

click heatmap

Google Glass for Education

eLearn.Glass
Capturing still images and recording video with Glass is easy.

SUGGESTED ACTIVITY

Build your own first-person video lesson. Familiarize yourself with filming with Glass. Create a video for a flipped classroom. Take your students on a virtual field trip. Recommendations: Keep it simple and brief. Avoid capturing unnecessary footage. Recording long videos burns up the battery, so use a rechargeable USB pack to extend filming time if possible. Have fun!

FURTHER EXPLORATION

STREAM VIDEO WITH LIVESTREAM
iterative design

- test and measure the effectiveness and efficiency of the website
- test with target users at different stages of the project
- redesign user interface based on feedback from user testing
before & after

- Eliminated study components from site
- Streamlined bottom nav buttons
- Revised code so videos re-sized with correct aspect ratio
- Changed headings to black so only links are in red
- Made entire bars of drop-down panels clickable
technological tools

Ps  Ai  Ae  Id

WordPRESS

Pinnion Plugin

inspectlet

TechSmith CAMTASIA STUDIO

Microsoft Office
Much More
TO COME
head-mounted displays

augmented reality • virtual reality

questions
mahalo!

Dr. Fulford, Dr. Lin, Dr. Sorenson
Critical friends: Terri Saragosa & Ed Lee
Advisor: Dr. Michael Menchaca
Entire LTEC Ohana
My Supportive Family!