Access & Explore: Using Environmental Control in the Classroom…and more!

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IDEAS
June 4, 2015 at 10:00 AM
www.gatfl.gatech.edu
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• The move from classroom to real life can be a major transition. Students go from being surrounded by their teachers, peers and helpers regularly, to being by themselves more often and needing to learn strategies for independence.

• Creating an environment in the classroom that enables learning independence can help ease the transition process.

• In this session, presenters will discuss affordable environmental control solutions that can be implemented in the classroom and then used to make the transition process into postsecondary and/or community living a smooth process.

• Multiple environmental control options and options for interacting with the environment (voice, computer, tablet, phone) will be covered.
Objectives

At the end of this session, participants (you) will be able to:

1. List 3 environmental control protocols and their effectiveness.
2. Assess and implement solutions for students to interact with their environment.
3. Identify 3 affordable solutions to implement in the classroom.

For Handouts: http://www.gatfl.gatech.edu/tflwiki
Our Goal Today

✓ Share information about various environmental controls.

✓ Give examples/scenarios of using environmental control in the classroom.

✓ Explore how getting accustomed to using environmental control in the classroom can help students throughout the transition process and to postsecondary education, community living, and the workplace.
AMAC Accessibility Solutions creates practical solutions that work, with a focus on utility, ease of use, and high quality.

- **Accessibility Consulting** focuses on organizational accessibility needs with evaluation, technical assistance, customer support, and website accessibility solutions.

- **Braille Services** produces customized projects from both print materials and electronic text including partial books and chapters or graphics only using cutting-edge technology.

- **Captioning Services** makes classrooms, meetings, labs and other audio environments fully accessible for deaf or hard-of-hearing.

- **Professional E-Text Producers** provide high-quality e-text in many formats such as PDF, DOC, DAISY, and HTML.

- **Certified Assistive Technology team** provides on-site and remote assessments, demonstrations, training and technical assistance for education, work, and daily living environments.

For more information, please visit our website at [www.amacusg.org](http://www.amacusg.org)
We’re here to help Georgians with disabilities gain access to and acquisition of assistive technology devices and assistive technology services so they can live, learn, work, and play independently in the communities of their choice.
Tools for Life
Georgia’s Federal AT Act Program

• TFL developed Georgia’s Plan for AT
  • We serve individuals of all ages & disabilities in Georgia
  • Over 50,000+ thru various activities throughout the year

• TFL Network
  • Assistive Technology Resource and Outreach Centers
  • AT Assessments
  • Access to statewide Lending Libraries
  • Training (group and individual)
  • AT Demonstrations
  • AT Reuse
  • AT Funding Education/Assistance and Resources

• Online Resources at www.gatfl.gatech.edu
Tools for Life Network
Welcome to Tools for Life

Tools for Life, Georgia’s Assistive Technology Act Program, is dedicated to increasing access to and acquisition of assistive technology (AT) devices and services for Georgians of all ages and disabilities so they can live, learn, work and play independently with greater freedom in communities of their choice.

Tools for Life and the TFL Network work collaboratively together to accomplish...
Defining Environmental Control

• An environmental control device is a form of electronic assistive technology which enables people with significant disabilities to independently access equipment in their environment e.g. home, classroom and/or office.

• An environmental control controller is the device that controls the equipment – like a remote control. The controller is used to select a range of different options. Each option will control a piece of equipment in a certain way – for example: volume on a TV.
Who needs Environmental Control?

• Anyone with complete loss or minimal ability to control devices in their immediate environment (such as the television, computer, phones, lights, doors, etc.).

• Technology that allows a people with disabilities to gain this type of control has been called an environmental control system and/or units (ECS, ECU).
1. **Switch** - the user activates an accessible switch to control the environmental control unit, generally done through menu scanning.

2. **Voice** - the user speaks the commands to the environmental control unit "turn on bedroom light."

3. **Both**

   ✓ The more options available (switch, voice, and/or both) the more independence can be gained.

   ✓ **Tip!** Look for the ability to customize or combine the control (input) devices to meet needs. While a voice-activated system can give the most independence, one's voice can become weak by the end of the day, so an ECU that can be controlled by both voice and switch may be very beneficial.
Begin with the End in Mind
Critical Questions #1

• What do you want to control?
  □ Computer
  □ Game
  □ TV
  □ Lights
  □ Appliances
  □ Chair
  □ Door
  □ Faucets
  □ Smartphone
Critical Questions #2

• What access can be automated?
Critical Questions #3

• Could the environmental control unit (ECU) be mounted?
• If so, where?
  □ Wheelchair
  □ Table
  □ Desk
  □ Countertop
Critical Questions #4

• How will the ECU be accessed/controlled?

- Direct
- External
- Switch(es)
- Scanning
- Voice
• Are there any cognitive issues affecting number of choices, memory, etc.?
Critical Questions #6

• Will physical and cognitive abilities be changing over time?
  – Traumatic Brain Injury
  – Neurodegenerative Processes
Eli’s Request

• I want to control my lights, telephone, and all of my audio and video equipment - basically, I need it all.

• As I move around the classroom, it would be ideal if I could do all of that from my wheelchair.
Eli’s Situation

Applied Methodology:
1. Lights, Telephone, Audio/Video Equipment
2. Wheelchair mounting
3. Voice Control
4. No cognitive impairments
5. Stable abilities over time
Eli’s AT Solutions

AT Solutions:

• Pilot Pro - The Pilot Pro offers advanced voice controlled ECU functionality.

• X-10 modules - Various X-10 modules control lighting and appliances.

• Sero!™ telephone - Easily-controlled compatible telephone.

• Latitude™ ARM and triangle plate - Use the Latitude ARM and small triangular mounting plate for a steady position and easy adjustments.
Combining the best in Infrared and X10 remote controls, the Pilot Pro brings the freedom of natural speech to appliances throughout the home. With the Pilot Pro, spoken commands are used for remote control of numerous devices in multiple environments. Control a television, telephone, lights, door systems, and more with simple, intuitive commands like, "TV... On" or "Channel... Up".

Pilot Pro is portable and programmable, meeting the needs of users at home, in the office, or within a healthcare facility. And its accessible - with switch scanning and 96 unique commands, arranged to suit the specific needs of your environment.

**Key Features:**
- 96 different words available in menus
- RF and IR interfaces for all devices and X-10 controls
- Programmable, adjustable menus with support for macros
- Designed for complex home automation systems
- Voice training with no computer required
- Convenient graphic display
- Auditory and Visual feedback
- "Direct Learning" infrared for easy programming with your existing remotes
- Supports external microphones
- Latest generation speech recognition technology
- Internal microphone
X-10 modules

X10 communicates between transmitters and receivers by sending and receiving signals over the existing electrical wiring in your home. The X10 Transceiver then sends commands to the X10 modules. A separate X10 module is required for each appliance you want to control.

For example: This is a on/off control of 3 prong appliances for up to 15 amps.
The Possum Sero! provides, for the first time, a loud speaking, remote control telephone and answering machine with AAC communication aid functions. The Sero! can be operated via the majority of Possum, Infrared enabled home controllers and Communication Aids.

- **Communication (AAC)**
  50 User-recordable phrases (each 60 seconds long) allow people with partial or no voice to communicate crucial messages over the telephone.

- **SSI© (Secure Spoken Identity)**
  Secure Spoken Identity, using caller ID services, will speak the name of the person calling (if the caller’s details are in the phone book). Unsolicited calls can be diverted straight to the answering machine.

- **Emergency Dialing Features Include:**
  - Remote activation of the emergency dial number via the Possum Jive!, Primo!, or any other appropriate infrared device.
  - Automatic Help Call function which dials up to 8 contacts until a response is registered.

- **Key Features**
  - Hands free calling
  - Remote Control via IR
  - Emergency Dialing
  - Speakerphone
  - Answering Machine
  - Recordable Memos
  - Communication Aid Feature
  - SSI© (Secure Spoken Identity) - Voice announcing caller ID*
The Latitude™ Customizable Mounting System provides an ideal balance of strength, durability, and flexibility. The Latitude™ ARM makes it easy to handle just about any mounting challenge. From a standardized base interface, to quick-release levers, to a universal plate connector, the Latitude™ ARM gives you all the options of a mounting system that costs much more.

Key Features

- **Plate Connector**: Allows for quick change of products
- **3D Joints**: All joints allow 360° of rotation on any axis (any direction) Unique design provides superior clamping strength Joints can be moved to any position along a tube
- **Quick Release Handles (Levers)**: Allows for easy positioning or adjustment without tools Pull and rotate handle to desired position after adjustment
- **Standardized Base Interface**: Allows for quick transfers between different base types and locations (Ex. Wheelchair to Bed Rail)
A Closer Look at AT Solutions
Future

- Level out the playing field
- The Future is Contextual
  - GPS apps
  - Ads on Internet
  - Smart watches
  - Social Media
Locabulary

- Uses GPS to track user location and suggests appropriate vocabulary based on location
  – ie: McDonald’s, Starbucks
- A keyboard to type for text-to-speech
- User can tag their own locations and create vocabulary for each location
- Lite version Free
- Pro version $130
Adaptive Switch Laboratories (ASL)

Products / New Products

ASL brings innovative products to our clients! We are here to help each client reach their full potential – our team creates products and designs as a direct result of the needs of those we serve. Our goal has always been independence and equal rights for those we work with....

Driver Control Packages

- 104 Electronic Head Array
- ASL 138 Extremity Control Joystick

Electronic Switches

- ASL 215 Round Proximity Sensor with Mono Port and 24 Volt Connector

Specialty Products & Adaptors

- ASL 112D Multi-Input USB Accessory
- ASL 500 Extremity Control
Joystick to Mouse Emulator

- Allows any joystick to point & click just like a mouse.
- Joystick can position the mouse cursor and enables the joystick buttons to operate as mouse buttons.
- Provides computer access and control via joystick to do with limited mobility.
Button Switch

• The ASL 305 Button Switch is a momentary switch.
• Activation button the size of a dime
• Requires medium force for activation.
• Enables easy access to multiple wheelchair functions (tilt, recline, power legs, elevate, etc.)
Ultra Light Switch

• The ASL 314 Ultra Light Switch has a very light activation force and low profile.
• Ideal for people with limited movement or weakness.
• Attach with a reusable sticky base or 2 screw mounting holes for secure placement.
Tongue Drive System

- Wireless device that enables people with high-level spinal cord injuries to operate a computer and maneuver an electrically powered wheelchair simply by moving their tongues
- Dental retainer embedded with sensors
- Detect movement of a tiny magnet attached to the tongue
- Testing with iPods and iPhones

GA Tech
Shepherd Center and Rehab Institute of Chicago
GT Tongue Drive System
Heated Mouse

- Warms hands
- Good for someone with arthritis or MS
- High/low/off for heat
- Low voltage; safe for computer use
DXT Fingertip - Vertical Wireless Mouse

• Ergonomic Relaxed Neutral Wrist and Hand Position
• Precision Grip for Accurate Navigation
  • Small muscles and joints of the fingers have higher processing abilities
• Instantly Switches Between Right and Left Hand
Joystick Access
Contour Roller Mouse

• Ergonomic alternative to the traditional mouse that sits directly in front of your keyboard
• Does not require your back, neck, and shoulders to be involved in mouse work
• Grip-less
• Built-in wrist supports
• Placed in the middle of the recommended work zone, eliminating long and repetitive reaching movements
Eyegaze Edge

• Control computer and tablet using your eyes
• Environmental Controls
• Communication
TOBII Eye Mobile

- Hands free access to Windows 8 Tablets
- Navigate, communicate, play using your eyes
- Supports Switch and Touch Inputs
- Small and Lightweight
Microsoft Speech Recognition

- Dictate and edit
  - dictate words into word-processing programs or to fill out online forms in a web browser

- Control computer
  - run programs and interact with Windows

- Built-in
- Train computer to voice
- Need microphone
Dragon NaturallySpeaking

- Speech recognition software
- Control your computer with your voice
- Works fast, 99% accuracy
- Dictate documents
- Search the web
- Precise and quick training
If you can control your computer, you can control your environment!
A Closer Look at AT Solutions: Recreation and Socialization
Mealtime Partner Feeder

- Variety of mounts
- Battery operated
- Control amount of food
- Control pause time between spoonful
- Adjustability of the spoon
Bestic Feeder

- Bestic can best be described as a small, robotic arm with a spoon in the end that can easily be maneuvered.

- Bestic is small and compact, has an attractive, discreet design and is very quiet which makes it blend into the dining environment in a natural way.

- By choosing a suitable control device, the user can independently control the movement of the spoon on the plate and choose what and when to eat.
Switch-Adapted Digital Camera

- One switch to turn camera on/off
- Second switch for snapping the pic
- Start/stop video
- $349; includes mounting arm
The Logitech Harmony Remote product line has recently added a hub and an app for your mobile device that allow you to control your entertainment devices.

Multiple tasks, such as turning on the TV, switching it to the appropriate source, turning on the cable box and the audio receiver can be programmed into a single button.
• Touchpad is an Android app that makes your mobile device a new way to control your Windows PC.

• Users can use their device as a replacement for the mouse.

• The app includes multi-touch gestures making it easy to emulate dragging and dropping on the touch screen.
Xpadder

• Xpadder is a free program for Windows that allows you to configure the inputs on most videogame controller any way that you like.

• You can have media controls assigned to different buttons so you can easily pause or control volume.

• The mouse as well as the keyboard are easily emulated on the controller as well.
MOGAnywhere

- Enables you to play video games on your Apple or Android phone.
- Great for gamers with limited mobility
- $29.99 to $99.99
Playstation 4 Media Console

• The PS4 isn’t just a gaming console. It is a multimedia center.
  – Apps
  – Internet Browser
  – Social Network
  – Voice Control
  – Controller Input vs Keyboard and Mouse
Playstation 4

• Sony recently updated their firmware for the Playstation 4 **media** console. This update included many new accessibility features appearing on a device of this kind for the first time ever.
  – Remap Inputs
  – Magnification
  – Font Customization
  – Color/Contrast control/inversion
Mobile Devices

• Explore various mounting options to hold mobile devices
• Helps with posture
• Operate wheelchair or other mobility aid safely
• Builds confidence
• Now I can text Ben & Trey all the time!
VGo Telepresence Robot

- Enables a person to replicate themself in a distant location and have the freedom to move around as if they were physically there.
- Reduces travel costs
- School
- Hospital
- Work Remotely
People with Disabilities in the Work Place

VGo increases productivity and effectiveness while lowering costs by enabling a person to get to a location instantly and easily. VGo is not designed as a replacement for in-person interaction but rather as the next best alternative to “being” in the workplace. VGo also eliminates the deficiencies associated with other video solutions that are locked to a TV or computer monitor by providing 100% remote controlled mobility.

In addition to “being” at work from home, VGo can help people who can get to the workplace, but who cannot practically move about the facility or campus. A VGo can be used to enable a person to move around in one part of the facility while they are physically in another.

The benefits of using VGo in the workplace include:

- Getting to places previously inaccessible increases opportunities
- Freedom of movement increases personal interaction with others
- Quality of life improvements by expanding the work and social environments
- Costs can be reduced by lowering or eliminating select transportation expenses, and by communications and speeding decision making
Kubi

- Dock your tablet for remote pan and tilt controls
- See and interact with people during a conference call
- Use any Video Client: Skype, FaceTime, Google Hangout, etc.
- Cloud Control
Building Access

• It's important to not only think of environmental control as a short distance radius around you, but as your true environment/surroundings.

• Building and infrastructure access is equally as important. Getting inside the building is one of the initial steps to controlling your environment!

• Example: in 1997 Georgia State University teamed up with Georgia Tech to create an innovative environmental control system that was easily accessed with a small remote and minimal movement. This enabled me to exit the MARTA bus, access the elevator up to the student common area, access the post office, access to student community center, open my building door, access the elevator up to my floor, open my apartment door, and lock it behind me. I hear that students are still accessing and using this technology successfully today!

• Video Demo
Environmental Control Solutions
Environmental Controls

VeraLite
Smart Home Controller

YOUR NEW ASSISTANT

HOME CONTROL DOESN'T HAVE TO BE COMPLICATED OR EXPENSIVE. SO WE CAME UP WITH THE VERALITE SMART CONTROLLER, WHICH IS SIMPLE AND INEXPENSIVE. IT MAY BE SMALL, BUT IT’S CAPABLE OF BIG THINGS!

- Easily manages up to 70 devices
- Plug and play with your Internet connection
- Controls over 750 smart products of all kinds
- Custom text and email alerts for any situation

VeraLite gives you easy control over lights, cameras, thermostats, door locks, alarm systems and more. Plus you can add intelligence to almost anything electronic in your home, and VeraLite can control them too. All the smart home benefits you’ve been looking for are right here in this easy, inexpensive add-on to your home network.

AN AMAZING AMOUNT OF SMART TECHNOLOGY THAT FITS IN THE PALM OF YOUR HAND.

VeraLite gives you easy control over lights, cameras, thermostats, door locks, alarm systems and more.

ONLY $179.95

WHAT'S IN THE BOX
Vera gateways can be controlled with a number of different interfaces.

- **First Party Software**
  - PC
  - MAC
  - Smartphone App

- **Third Party Software**
  - Smartphone Apps
  - TASKER! (Android only)
Tasker is a phone automation application that allows you to really unleash your android device’s capabilities.

Tasker in a nutshell is a program that tells your device “When this happens, do this!”

• “When something is plugged into the headphone jack, open my music app”
• “When I open the navigation app, turn GPS on”
• “When my phone is connected to this cell tower, turn on wifi and connect to my home wifi”
Plugins for Tasker allow you to access other features of your phone and interface with other internet connected devices.

- **Autovoice** – Allows you to set up custom voice commands and turn always listening on
- **Autocast** – Enables you to control a Chromecast device on your TV
- **Autovera** – Interfaces with your Vera gateway
Castle OS and Castle Hub

- Chris Ciccitelli has been a fan of Star Trek and was fascinated by the idea of a computer listening to you and taking any action requested. Sometimes it was just retrieving information, other times it controlled different ship functions.
- Chris worked for years creating a system for home automation/control that emulated the computer on Star Trek.
- Castle OS and Castle Hub are able to control all other EC devices regardless of what protocol it uses.
- This system operates using the microphone array in the Kinect camera to listen to you from anywhere in the room.
In preparation for my transition to college, I have begun to equip my family's house with smart home appliances that I can control using my mobile devices.

So far, my family has installed:
- A Nest Learning Thermostat
- Philips Hue Lightbulbs
- General Electric (GE) Link Lightbulbs

All of the products above are controlled by a Wink Hub.

In the future, my family and I hope to install more appliances such as remote control window shades and smart locks.
Samsung Gear Live

• One of the first generation of Android Wear Watches.

• Android Wear is a version of Android made specifically for wearable technology

• Android Wear allows you to access all the same capabilities your phone provides, conveniently located on your wrist.
  – Voice Recognition
  – Notifications
  – Fitness and health monitors
Moto 360 by Motorola

• Runs Android Wear, Google's operating system for smartwatches.
Moto 360 by Motorola

• Classroom Applications:
  – Todoist for Android Wear allows me to quickly view my homework assignments and check them off as I complete them.
  – Evernote for Android Wear allows me to study my notes on the go.
Moto 360 by Motorola

• Transition Applications:
  – Tockle for Android Wear allows me to send preset text messages to my caretaker to let them know that I need assistance.
  – Through applications such as Wink and Hue Control for Android Wear, I can control certain aspects of my smart home appliances from my watch. However, these applications are not full solutions for controlling all of my smart home appliances from my watch.
Google Glass Update

• Wearable Technology
• Bluetooth Connection
• Navigate
• Make a Call
• Send a Message
• Take a Picture or Video
• Get the News
• Search
• Google Play Music
• Google Now
• Be Social
• Internal Compass
• $1500
The Future of this OS is Limitless

• Google has the futuristic ambition and the funds to take Android to unprecedented heights. In many areas — such as predicting what users will do next.

• Google Now knows that in the morning you’re getting ready for work and will tell you about the traffic.
Google Now

Introducing Google Now

The right information at just the right time

From knowing the weather before you start your day, to planning the best route to avoid traffic, or even checking your favorite team’s score while they’re playing. Google Now brings you the information you want, when you need it.

Assistance around the clock
Know Your Tablets and Apps!
Technology Rapidly Evolves

- June 2007 - 1st iPhone
- Sept 2007 - 1st generation iPod Touch
- October 2008 - 1st Android phone sold
- April 2010 - 1st iPad
- 2010 - Google launched its Nexus series of tablets and smartphones
- 50 billion downloads!
Which One???
Microsoft Surface

- Windows 8
- Slim
- USB port
- Moveable Tiles
- Built-in Accessibility
  - Speech-to-text
  - Narrator
- Thin pressure sensitive cover that doubles as a keyboard
Samsung Galaxy

- Need to download accessibility features
- 7 inch or 10 inch screen
- Flash
- WiFi
- SIM card for storage
Apple iPad, iPad mini, iPod Touch

- Multi-touch screen
- Millions of apps
- Surf web
- iTunes
- Videos
- Organization
- Accessibility
- Books
- Photos
- Speakers
Prestorian APPllicator

- Inclusive TLC
- Bluetooth
- Access switch accessible apps
- Up to 4 switches
- Paired to iPad/ iTouch/ iPhone
- 64 ft operating range
- Programmable functions
Tecla Shield

- Wireless device that controls smartphones and tablets using your external switches or the driver controls of your power wheelchair
- The only switch interface that works with both iOS® and Android mobile devices.
TFL AppFinder

Search by:

- App Name
- Categories
  - Book
  - Education
  - Environmental Adaptations
  - Hearing
  - Cognition, Learning, Developmental
  - Navigation
  - Personal Care and Safety
  - Productivity
  - Communication
  - Therapeutic Aids
  - Vision
Dragon Dictation

- Voice Recognition
- Free
- Dictate notes, emails, Twitter, and Facebook
- Supports many languages
- Cut, Copy, Paste
- Android
  - Dragon Go!
  - Dragon Hands Free Assistant
Touchmouse

• By Logitech turns your iPhone or iPod touch into a wireless trackpad and keyboard for your computer
• Works over Wi-Fi
• Need to download the Touch Mouse Server software
• Swype is an alternative keyboard for the Android mobile operating system.

• For some, it is easier to type words by dragging their finger across the keyboard than it is to press each key individually.
Remote Mouse

- Turns your mobile phone or tablet into a wireless remote control for your computer
- Fully simulated mouse
- Magic trackpad
- Multi touch Gestures
- Landscape mode
Mobile Payment Applications

• Looking forward towards my transition to college, I realized that I would need a way to easily pay for things at stores without having to handle physical money or credit cards.

• I began researching mobile payment applications that utilize Near Field Communication (NFC) technology.

• NFC technology allows users to pay for things by simply typing in a PIN number or scanning their fingerprint and holding the back of their phone up to a credit card terminal that accepts NFC.
Mobile Payment Applications

• Examples of these applications include:
  – Google Wallet (for Android, will be replaced by Android Pay soon)
  – Apple Pay (for iPhone 6, iPhone 6 Plus, & Apple Watch)

• Paying with NFC is A LOT more secure than paying with a normal credit card.

• In the future, I hope to see more stores accept NFC as a payment method and to see NFC technology included in more wearable devices.
Preparation for the Future

Ready for the Workplace

All of the solutions, helpful tools and strategies that I learned over the years are helping me to be successful today!

Let your environment work for you!
Resources

- [http://www.etoengineering.com/environmental_control_unit.htm](http://www.etoengineering.com/environmental_control_unit.htm)
Our question to you:
What have you learned today?
The Tools for Life Team

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