“Mash that Button, Press that Switch”: Switch Use to Support Communication and Learning

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For our students with severe physical disabilities, access is the most critical piece of the puzzle. Without the appropriate selection of tools and then the provision of those tools for physical access we leave our students with severe physical disabilities with extremely limited means of independence, participation and communication.
Switches

Switches come in a variety of sizes, shapes, and activation modes (pressing, pulling, swiping, twitching, sipping, puffing, rolling.....). Switches may be ordered commercially or custom made. Occupational and Physical Therapists are invaluable resources for switch selection and placement.
Who Can Benefit from Switch and Scanning Access

• Individuals with severe motor involvement who can not use a more direct mode of input and students with severe visual impairments; such as cortical blindness, progressive syndromes, low visual acuity, unstable vision, and/or visual perceptual difficulties.
Who Can Benefit from Switch and Scanning Access

• **Further Considerations:** Does the individual have the necessary:
  
  – switch skills
  – attending skills
  – choice making abilities
  – visual functioning
  – visual tolerance

Who Can Benefit from Switch and Scanning Access

• **Further Considerations:** Does the individual have the necessary:
  - auditory functioning
  - auditory tolerance
  - comprehension skills
  - retrieval skills
  - categorization skills

*Hanser & Wagner, “Got Switch?”, 6/11/2002*
Areas That Utilize Switch Access

• Any area that a student needs access to their academic, cognitive, language or communication tasks
  – Communication
  – Language Development
  – Academic
  – Computer Access
  – Mobility
  – Activities of Daily Living/Recreation/Leisure
Switch Use Barriers

• Switch Banging/pushing switch away
• Difficulty finding placement/right switch
• Difficulty with frequent practice opportunities
• Fatigue
Switch Use Troubleshooting

• Consult with Physical/Occupational Therapist regarding switch type and placement/mounting
• Variation of switch use activities
• Increase switch use opportunities
Building Skills of the Switch User: Kelly Fonner (2005)

- Special Education Technology British Columbia (SETBC)
  - 3-part Video Series by Kelly Fonner with related materials
  - [http://www.setbc.org/setbc/conf/docs/switches.html](http://www.setbc.org/setbc/conf/docs/switches.html)
Internet Switch Resources

- AT4Kids, founded by Peggy Paulson, includes numerous resources on several topics including switch use - http://at4kids.com/
- Assist- I.T. - resources for switch access - http://www.assist-it.org.uk/assets/content/switch_access.htm
Switching To Success
Stages in Switch Development
Tony Jones & Judy King

10 Primary Switch Rules

Web Resource

Tony Jones’ website is a “service by an Educational & AAC Professional to promote Augmentative and Alternative Communication and good practice in the user of Assistive Technology” – www.talksense.weebly.com
Teaching Switch Access
Considerations When Teaching Switch Access Skills

• Daily, consistent access to switch usage critical
  – need to initially focus on motor activity, not the language system
    • high motor demands: low language demands
    • low motor demands: high language demands
  – Hanser & Wagner recommend (Got Switch? June 2002)
    • at least 20 opportunities to practice per activity
    • at least 200 switch hits during daily routine
Considerations When Teaching Switch Access Skills

• Activities must be motivating and authentic
  – recreation/leisure
  – activities of daily living
  – curriculum access

• Large selection of activities to minimize boredom factor
Considerations When Teaching Switch Access Skills

• Developing Motor Automaticity
  – Cause/effect activities
  – Examples of activities:
    • turning on/off music
    • turn on/off TV, lights, etc.
    • software programs
      – recreation/leisure
      – curriculum based
  • Computer activities – i.e., Adapted Stories

Considerations When Teaching Switch Access Skills

• Activities for repeated, untimed activations:
  – Working toward activating switch within a timed format
    • Broad time frame (10-60 seconds)
  – Example —
    • repeated lines within a story using single message voice output

Considerations When Teaching Switch Access Skills

• Developing Reaction Timing
  – General reaction timing – activities that develop a faster reaction time, but the timing for the activation is not critical

Considerations When Teaching Switch Access Skills

• Activities for general reaction times:
  – Step by Step for class activity (calling roll, line leader, calendar time, etc.) (video)
  – All Turn It Spinner for Bingo, turn taking, math, etc.
  – Turn off/on music during songs (using SLAT in timed mode)
  – Pour Cups for pouring sand, small snacks, etc.

Considerations When Teaching Switch Access Skills

• Activities for specific reaction times
  – pour cups for measuring, pouring paint, milk, etc.
  – moving toy to specific targets
  – Low tech scanning techniques: Live Voice/Partner Assisted
  – computer software

and switches work with......

• Building switch use into daily activities

Switch Adapted Audio Stories

Battery Operated Scissors
and switches work with......

Tree Lights

Hair Dryer

Blender
Internet Based Switch Sites

- SwitchClimber (www.switchclimber.com)
- Priory Woods (www.priorywoods.middlesbrough.sch.uk)
- NanoGames (www.arcess.com)
- SENSwitcher (www.northerngrid.org/ngflwebsite/sen/intro.htm)
Prompt Hierarchies
Prompt Hierarchy

Level of Support:
• Natural Cue

Example:
• During leisure time, two activities are present with the communication device. The presence of the activities cues the student to request or respond. *(Wait for appropriate time delay)*
Prompt Hierarchy

Level of Support:

• Open Ended Question

• Model response for student

• Visual Cue

Example:

• “What do you want to play with?” (Wait for appropriate time delay)

• “I want to play with the music” (while activating the symbol for music) (Wait for appropriate time delay)

• Pointing to the communication system (Wait for appropriate time delay)
Prompt Hierarchy

Level of Support:
• Verbal Cue
• Visual & Verbal Cue
• Physical Assistance

Example:
• “Do you want to play with music?” (While pointing to the symbol of music) (Wait for appropriate time delay)
• “Let’s play some music.” (Wait for appropriate time delay)
• Taking the student’s hand and assisting them with activating a location.
Tools for Physical Access
Basic Switch Properties

- Surface Area
- Sensitivity
  - Operating Force
  - Amount of Travel
  - Dispersion (activation area)
  - Adjustability

Fonner, Kelly “Building Skills of the Switch User” SET:BC Webcast, 2005
Basic Switch Properties

• Sensory Feedback
  – Light
  – Auditory
  – Tactile

Fonner, Kelly “Building Skills of the Switch User” SET:BC Webcast, 2005
Types of Switches

• Single Switches
  – Designed with one surface area for activation
    • Selects and activates an item or activity
    • Controls movement and selection of target when used in scanning

Big Red Switch
AbleNet
www.ablenetinc.com
Types of Switches

• Dual Switches
  – Designed with two surface areas for activation
    • One area used for selection of item
    • One area used to control movement to target when scanning

The Rocker Switch
EnableMart
www.enablemart.com
Types of Switches

• Multi Switches
  – Designed with more than 2 surface areas for activation, generally 5 areas
  • Controls movement of mouse right, left, up, down and select (click)

  USB Star
  www.enablemart.com

  USB Penta
  www.enablemart.com
Pressure Switches

- Activate by applying pressure to the surface of the switch
  —Examples of switch with wide dispersion area

Big Red Switch
AbleNet
www.ablenetinc.com

Jelly Bean Switch
AbleNet
www.ablenetinc.com
Pressure Switches

• Plate Switches
  – Examples of switches with one dispersion area

Foot Switch
Enabling Devices
www.enablingdevices.com

Plate Switch
Enabling Devices
www.enablingdevices.com
Pressure Switches

• Other features
  – Examples of switches with a variety of textures, sizes, or surface types

Textured Switch
Enabling Devices
www.enablingdevices.com

Micro Light Switch
EnableMart
www.enablemart.com

Petite Pillow Switches
Enabling Devices
www.enablingdevices.com
Toggle/Reed Switches

• Activate by pushing the toggle/reed in any direction
  – Come in a variety of sizes and travel ranges

Leaf Switch
Enabling Devices
www.enablingdevices.com

Wobble Switch
Prentke Romich
www.prentrom.com
Specialty Switches

- Pneumatic Switches
  - Operates by air pressure
Specialty Switches

• Certain Switches can provide multiple methods of activation
  – Touch
  – Sound
  – Infrared

Infrared/Sound/Touch Switch (IST)
Words Plus
www.words-plus.com
Specialty Switches

• Switches can activate by detecting electrical impulses generated by muscles
  – EMG (Electromyography) Muscle Switch Kit

EMG Muscle Switch Kit
Broadened Horizons
www.broadenedhorizons.com
Wireless Switches

• Utilize radio waves from the switch to the receiver connected to the object or computer
Bluetooth Switch

• Utilizes bluetooth technology between the switch and the receiver

Blue2
AbleNet
www.ablenetinc.com
Additional Switch Access Tools

• Battery Interrupters
  – Used to make a battery operated device switch accessible

• Switch Latch & Timers
  – Allows a variety of switch operations for battery operated devices

Switch Latch & Timer
AbleNet
www.ablenetinc.com
Additional Switch Access Tools

- Electronic switch accessible environmental control units

Power Link 4
AbleNet
www.ablenetinc.com
Switch Mounts
Mounting Switches
Considerations

• Considerations when mounting a switch
  – Motor movement of the individual
    • Position return
  – Control site for the switch
    • Location/body part used to control switch
    • Body Positioning
  – Type of Switch
  – Position of the switch
    • Adjustability, angle, etc.
Mounting Switches
Guiding Principles

• When mounting a switch, the mount should be:
  – Stable
  – Non-interfering
  – Safe
  – Flexible
  – Cosmetically Pleasing

Goossens’, C., Crain, S. “Utilizing Switch Interfaces with Children Who are Severely Physically Challenged”, Pro-Ed, 1992
Tools for Mounting Switches

• Mounts should be lightweight, durable and flexible

  ProLite Switch Mount
  CJT Enterprises
  www.cjt-yes.com

  Universal Switch Mount
  AbleNet
  www.ablenetinc.com
Integrating with a Wheelchair  
Be Sure to Plan Ahead!

3 - SWITCH "HEAD-ARRAYS" may be setup via the wheelchair controller's "ECU" port. Your wheelchair's actual hardware compatibility for this MUST be verified by your wheelchair dealer first. (See our list of questions* for your dealer)

WHEELCHAIR JOYSTICKS can be connected via the wheelchair controller system's "ECU" port. Your wheelchair system's compatibility for this MUST be verified by your wheelchair dealer. (See our list of questions* for your dealer)

* The Penny and Giles "Joystick" is NOT really a joystick; it is a MOUSE-emulating device and works on the MT / DV4 system in "Mouse" Selection-Method.
Switches and Computer Access
Using Switches to Access Computers

• Switch Interfaces
  – Switch Adapted Mouse/Trackball/Joystick
    • Orbit Trackball (www.kensington.com)
    • Roller Ball Plus (www.donjohnston.com)
    • Wave Switch Adapted Trackball (www.ablenetinc.com)
Using Switches to Access Computers

- Switch Interfaces
  - Multiple/Programmable Ports
    - USB Swifty (www.orin.com)
    - Hitch (www.ablenetinc.com)
    - DJ Switch Interface Pro (www.donjohnston.com)

Swifty
Origin Instruments
www.orin.com

Hitch
AbleNet
www.ablenetinc.com
Wireless Switch Interfaces

- Provides a wireless connection from switch interface to computer
  - Utilizes a USB dongle on computer to receive signal from interface

IntelliSwitch
AbleNet
www.ablenetinc.com

Beam
Origin Instruments
www.orin.com
Switch Access for Kindle or iPad

• PageBot for Kindle
  (www.orin.com)

• Big Button Ipod Remote
  (www.rjcooper.com)
Up and Coming Technology

• Tekla
  – Switch access application from Inclusive Design Research Centre for android mobile devices (idrc.ocad.ca)

• Tornado
  – Upcoming switch interface from Origin Instruments for the iPad (www.orin.com)
Switch Accessible Software
Software Designed for Switch Use

Cause & Effect

• Software designed to provide beginning practice for switch usage and cause & effect concepts
Software Designed for Switch Use

General Reaction Times

• Provides practice using switches for activities that require switch activation within a broad time frame

New Frog and Fly
SimTech
www.marblesoft.com

Super Switch Puzzles
SimTech
www.marblesoft.com
Software Designed for Switch Use

Specific Reaction Times

• Provides practice using switches for activities that require switch activation within a specific time frame

Switch Wars
The Space Battle Game For Switch Users
by Bill Lynn

Spider Maze
SimTech
www.marblesoft.com

Switch Wars
SimTech
www.marblesoft.com
Switch Training Software

• A software program that provides switch training and practice utilizing a series of graduated practice activities to increase switch usage and scanning skills
Switch Accessible Curriculum Supports Software
Software for the Curriculum

• Switching on Science Series
  - Earth
  - Habitats
  - Solar System

• Switching on American History

Switching on Science: Earth
SoftTouch
www.softtouch.com

Switching on American History
SoftTouch
www.softtouch.com
Software for the Curriculum

• Software for Literacy Development (www.donjohnston.com)
  - Start to Finish Literacy Starters
  - Start to Finish Books
  - Simon Sounds It Out
Software for the Curriculum

• Software for Early Learning Activities

Early Learning I
Marblesoft
www.marblesoft.com
Software for the Curriculum

• Software for Math
  - MathPad (www.intellitools.com)
  - MathPad 2 (www.intellitools.com)
  - Calcu-Scan (www.mayerjohnson.com)
Software for Authoring

Clicker 5
Crick Software
www.cricksoft.com

Graphic used with permission of Crick Software
Software for Authoring

PixWriter
Slater Software
www.slatersoftware.com
Augmentative Communication Systems
Communication Systems with Switch Access

• Low Technology Systems

Step by Step
AbleNet
www.ablenetinc.com

BIGmack
AbleNet
www.ablenetinc.com
Communication Systems with Switch Access

- Low to Mid Technology Systems

Partner Plus 4
AMDI
www.amdi.net

TechScan 8
AMDI
www.amdi.net

Talk 4 with Levels
Enabling Devices
www.enablingdevices.com
Communication Systems with Switch Access

- Mid to High Technology Systems

TechScan 32
AMDI
www.amdi.net

SpringBoard
Prentke Romich
www.prentrom.com

M3
DynaVox
www.dynavoxtech.com

GoTalk Express
Attainment
www.attainmentcompany.com
Communication Systems with Switch Access

• High Technology Systems

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Dynavox product images were used with permission from DynaVox /Mayer-Johnson (Pittsburgh, PA)
Scanning Access
Access Methods

• Visual Scanning
  – User accesses display by viewing a highlight that advances through each location based on scan pattern selected.
Access Methods

• Auditory Scanning
  – User accesses display by listening to an auditory prompt spoken (which represents the programming on each location) as it is highlighted based on scan pattern selected.
Access Methods

• Partner Assisted Visual Scanning
  – Communication partner may point to or shine light on choices (picture symbols, objects, photographs) and student activates device such as BIGmack with confirmation message “I want that one!” to indicate preference. A reliable body movement is acceptable to indicate preference.
Access Methods

• Live Voice Auditory Scanning
  – Communication partner presents choices auditorially and student activates device such as BIGmack with confirmation message “I want that one!” when they hear choice stated to indicate preference. A reliable body movement is acceptable to indicate preference.
Access Methods

- **Single Switch Access**
  - A single switch is utilized to access a communication system or computer software

- **Dual Switch/Multi Switch Access**
  - 2 or more switches are used to access a communication device or computer software
Strategies for Success
Assistive Technology

• Use the assistive technology you have on a consistent basis.

• Have expectations of your students.

• Use a variety of tools to minimize the boredom factor.

• Provide access to the assistive technology in all environments and activities as needed.
Strategies for Success

Assistive Technology

• Use prompts as needed, but fade as quickly as possible to reduce prompt dependence.

• Provide adequate time for responding. Use time delay as needed.
Strategies for Success
Assistive Technology

Make It Fun and Motivating!!
Contact Information

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