UKAT Tool Kit:  
A Functional Approach to Assistive Technology

Introduction to AT

University of Kentucky Assistive Technology Project

Department of Special Education and Rehabilitation Counseling

A collaborative research project with Kentucky Public Schools

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IDEAs that Work  
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Assistive Technology Information Sources
Public Laws

1973 - Section 504
Section 504 of the Rehabilitation Act (P. L. 93-103)

1988 - Tech Act
Technology-Related Assistance for Individuals with Disabilities Act (P. L. 101-336)

1990 - ADA
Americans with Disabilities Act (P. L. 101-336)

1990 - IDEA
Individuals with Disabilities Education Act (P. L. 101-476)

1997 - IDEA
Reauthorization of IDEA (P. L. 105-17)

2004 - IDEA
Reauthorization of IDEA (P. L. 108-446)
Public Laws:
1973 - Section 504

- A civil rights statute which provides that “No otherwise qualified individual with disabilities in the United States shall, solely by reason of his/her disability, be excluded from the participation, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance…” (29 USC 749).

- “Levels the playing field”- to eliminate impediments to full participation by persons with disabilities.
Public Laws:
1988 - Technology - Related Assistance for Individuals with Disabilities Act

- Under the provisions of this law, financial assistance was provided to states through competitive grants to plan and implement a consumer responsive system of technology services for individuals of all ages with disabilities.

- Defined assistive technology devices and assistive technology services, and identified them as part of the continuum of services for persons with disabilities.
Public Laws:
1990 - Americans with Disabilities Act (ADA)

- While Section 504 applies only to organizations that receive federal funding, ADA provides civil rights protection against discrimination to citizens with disabilities in private sector employment and access to:
  - public services
  - transportation
  - telecommunications
Public Laws:
1990 - Individuals with Disabilities Education Act (IDEA)

- Amendments to 94-142 renamed IDEA (P. L. 101-476)
- Definitions of AT devices and services were adopted:
  - **Assistive Technology Devices**
    - “Assistive technology devices means any item, piece of equipment, or product system, whether acquired commercially off a shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of children with disabilities.”
  - **Assistive Technology Services**
    - “Assistive technology service means any service that directly assists a child with a disability in the selection, acquisition, or use of an assistive device.”
Public Laws:
1990 - IDEA (continued)

Assistive Technology Services
Includes -

a. the evaluation of the needs of a child with a disability, including a functional evaluation of the child in the child’s customary environment;

b. purchasing, leasing, or otherwise providing for the acquisition of assistive technology devices by children with disabilities;

c. selecting, designing, fitting, customizing, adapting, applying, maintaining, repairing, or replacing of assistive technology devices;

d. coordinating other therapies, interventions, or services with assistive technology devices, such as those associated with existing education and rehabilitation plans and programs;
Public Laws:  
1990 - IDEA (continued)

Assistive Technology Services
Includes -

  e. training assistance for a child with or, if appropriate, that child’s family, and;

  f. training or technical assistance for professionals (including individuals providing education or rehabilitation services), employers, or other individuals who provide services to employ, or are otherwise substantially involved in the major life functions of children with disabilities. (IDEA, P. L. 105-17, Section 1401 (a)(26).
Public Laws:

1990 - IDEA (continued)

- School districts must ensure that assistive technology devices or services, or both, are made available to a student with a disability in order to receive a FAPE.

- Assistive technology must be provided as part of the student’s:
  - special education
  - related services or
  - supplementary aids and services as described on the Individual Education Program (IEP).

- AT devices or services must be considered for all students in the IEP planning process.

1997 - IDEA

- Addition of consideration component requires that AT devices or services must be considered for all students in the IEP planning process.

2004 - IDEA

- Maintained definition of AT

- Maintained AT consideration component in the IEP process.
Assistive Technology Continuum

Consider a range of AT from “no tech” to “high tech”. A “high tech” solution is not always appropriate.

High Tech

Incorporates sophisticated electronics or computers.

Photo showing one of two students who was identified with reading difficulties using a screen-reader software program to have text read to them. Using this software, they are also able to access definitions to words that are unfamiliar to them.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/BoysScrn.mov
Medium Tech

Relatively complicated mechanical devices, such as switches and wheelchairs.

The Big Mac Communication Aide is a medium tech, easy-to-use device that works by recording and then playing back a message that can be up to twenty seconds long.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/BigMac.mov
Assistive Technology Continuum

Low Tech

Less sophisticated than Medium Tech devices and can include items such as adapted spoon handles, non-tipping drinking cups, and Velcro fasteners.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/Absc.mov
Assistive Technology Continuum

“No” Tech

Solutions make use of procedures, services, and existing conditions in the environment without the use of devices or equipment.

This sample of a “No” tech solution shows a boy with limited use of his arms eating his lunch in a cafeteria aided solely by the use of his “dexterous” feet that hold a fork with ease.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/TroyeatQ.mov
Application of Human Function Model

• Identifies factors that should be considered in making decisions about assistive technologies and how these factors relate to each other.

• Provides direction for those making referrals, conducting assessments, providing consultation, and developing IEPs.

• Guides decisions about instructional strategies and delivery of services.
Human Function Model

Evaluation and Feedback

Personal Changes

Select Functional Response

Personal Perceptions

Explore Options

Analyze Functional Demands

Personal Resources

External Supports

Environment and Context
Functional Areas Enhanced Through Assistive Technology

Existence

Communication

Body Support, Protection and Positioning

Travel and Mobility

Environmental Interaction

Education and Transition

Sports, Fitness and Recreation
Existence

Problems in Existence are associated with the functions needed to sustain life.

Possible Solutions:

• Adapted utensils
• Dressing aids
• Adapted toilet seats
• Toilet training
Existence

Adapted Utensils

Photo of a boy with limited use of his arms and hands, eating with a flexible long-handled adapted fork.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/Fork.mov
Existence

Adapted Hairbrush

Photo of a boy with limited use of his arms and hands, using an adapted long-handled hairbrush.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/brush.mov
Communication

Problems in Communication are associated with the functions needed to receive, internalize, and express information, and to interact socially.

Possible Solutions:

- Hearing amplifiers
- Captioned video
- Speech aids
- Sign language training
- Picture boards
- Pointers

- Writing and drawing aids
- Alternative input and output devices for computers
- Speech/language services
Communication

Communication Board

Photo of a boy answering questions presented by the teacher, by pointing to icons on a communication board.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/PctrCom2.mov
Communication

Dynamic Display

Photo of the use of a Dynavox, a voice output communication device with a dynamic display. Two screens are shown: a personal screen that is used to provide information about the user; and a calculator screen that is used to help complete math problems.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/LndDyn.mov
Communication

Braille Printer

Photo of a boy with visual impairments practicing his spelling words by reading them in Braille and then typing them into Duxbury, a Braille translation program. The assignment is then printed on a Braille printer that also provides a print copy for the teacher.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/HydnCP.mov
Communication

Communication Device

Photo of an augmentative communication device for written and verbal communication called a Liberator.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/Lib.mov
Communication

Communication Software

Augmentative communication demonstrated using the software program called Speaking Dynamically. The software can be loaded onto a laptop computer, and accessed by using a head mouse. In this demonstration, a boy is shown with a small device on the tip of his nose that controls the head mouse.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/MthSks2.mov
Body Support, Protection and Positioning

Problems in Body Support, Alignment and Positioning are associated with the functions needed to stabilize, support, or protect a portion of the body.

Possible Solutions:

- Prone stander
- Furniture adaptation
- Support harness
- Stabilizers
- Slings
- Head gear
- Physical therapy services
Body Support, Protection and Positioning

Wheelchair Supports

Photos of a wheelchair that has been designed with a sophisticated system to properly align and support the body. All back supports are on hinges and covered in foam. The supports are custom fitted to the curves in the back, which increases airflow. Other supports inhibit abnormal reflexes.

View or listen to the movie go to: [http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/WhlChrSptQ.mov](http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/WhlChrSptQ.mov)
Body Support, Protection and Positioning

Rocking Chair

Photo of a boy using a custom-built rocking chair for use as an alternate to a wheelchair. This chair is custom fitted with body supports and a motor, which makes it self-rocking. It was built by engineering students as a class project.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/RckngChr.mov
Body Support, Protection and Positioning

Per Mobil

Photo of a Per Mobil wheelchair. This chair can be used for more than just travel. It allows users to reposition their body throughout the day. To relieve pressure sores, users can lay back in the chair or stand up. Standing provides the opportunity to weight-bear, improving leg strength and preventing contractures.

View or listen to the movie go to: [http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/Purr.mov](http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/Purr.mov)
Travel and Mobility

Problems in Travel and Mobility are associated with the functions needed to move horizontally or vertically.

Possible Solutions:

- Wheelchairs
- Scooters
- Hoists
- Cycles
- Ambulators
- Walkers
- Crutches
- Canes
- Orientation and mobility training services
Travel and Mobility

Wheelchair Transfer

Photo of a girl in a wheelchair equipped with a hydraulic lift, which allows her to reach the floor independently for play activities. The chair can also be raised up to give the occupant a clear view above a crowd.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/RtofloorQ.mov
Travel and Mobility

Walker

Photo of a boy using a rolling walker which allows him to independently maneuver through his school and classroom.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/walker.mov
Travel and Mobility

Precane

Photo of a preschool girl with deteriorating eyesight using a pre-cane device. She uses this device to learn to first push the tool and to use it as a guide before learning to use a standard cane. This cane is weighted with a backpack to add stability.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/precane.mov
Environmental Interaction

Problems in Environmental Interaction are associated with the functions needed to perform activities across environments.

Possible Solutions:

- Use of switches to control equipment
- Remote control devices
- Adapted appliances
- Ramps

- Automatic door openers
- Modified furniture
- Driving aids
- Rehab Engineering services
Environmental Interaction

Adapted Light Switch

This photo shows a boy using an adapted light switch to turn on and off the light in a room. The adaptation gives the boy a larger area to grab and allows him to easily reach the device from the normal height of his wheelchair.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/ItswtchQ.mov
Environmental Interaction

Reacher

Photo showing a girl using a reacher, which is a low-tech device used to grab and retrieve an object that has fallen to the floor, out of normal range of her wheelchair.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/Rchr.mov
Education and Transition

Problems in Education and Transition are associated with the functions needed to participate in learning activities and to prepare for new school settings or post-secondary environments.

Possible Solutions:

- Adapted instructional materials
- Educational software
- Computer adaptations
- Assistive technology

- Community-based instruction
- Creative arts therapy
- Other related services
Education and Transition

Photo of a boy learning to use a Braille n’ Speak with the assistance of a vision teacher. It will take several years for him to become proficient with the device and the Braille code necessary for him to operate it. He currently uses the device to complete short writing assignments, but will eventually use this device to take notes in class.

View or listen to the movie go to: [http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/Brl&Spk.mov](http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/Brl&Spk.mov)
Education and Transition

Money Overlay

Photo of two students sharing an Intellikeys keyboard with an overlay designed for the software program they are using to learn about money. This alternate keyboard overlay provides a visual representation appropriate to their learning style.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/IntellQ.mov
Footmouse

Shows a boy using his computer aided by a foot mouse. He uses his left foot to control the direction of the cursor and his right foot to click. With this adaptation and an on-screen keyboard, the user will have access to most software programs.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/footmouse.mov
Adapted Scissors

Photo of a boy with limited use of his hands and arms, using adapted scissors to complete an art project. This low-tech solution makes cutting an easier task because the scissors are spring-activated and use pressure from the whole hand.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intromovies/scissC.mov
Education and Transition

OnScreen Keyboard

Photo of a boy using an on-screen keyboard that allows keys to be accessed with point and click of a mouse instead of requiring dexterity of multiple fingers striking the keys.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/Onscrn.mov
With instructional adaptations a boy who is blind is able to participate in all curriculum areas with his peers in an inclusive classroom. When other students complete their assignments with a pencil, he is able to write his assignments with the use of a Braille Writer. His reading book is Braille and he can listen to stories on tape with his peers.

View or listen to the movie go to: [http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/HydnRead.mov](http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/HydnRead.mov)
Sports, Fitness and Recreation

Problems in Sports, Fitness and Recreation are associated with the functions needed to participate in individual or group sports, play, hobby and craft activities.

Possible Solutions:

• Modified rules and equipment
• Special Olympics
• Adapted aquatics
• Braille playing cards
• Switch-activated camera
• Adapted physical education services
Sports, Fitness and Recreation

Water Skiing

Photo of a woman waterskiing using adapted water skis that allow her to participate from a seated position.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro_movies/waterski2Q.mov
Sports, Fitness and Recreation

Playing Cards

Two boys with limited use of their hands play cards with the use of several low-tech adaptive devices. They use an automatic shuffler to shuffle the cards. They use card-holders rather than hold the cards by hand. One of the boys card-holder sits on a blue dice mat, a material that helps to prevent objects from sliding.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/S&Jcds.mov
Sports, Fitness and Recreation

Switch-Activated Game

Photo showing a group of girls playing a board game on a playground. One of the girls who cannot speak or walk, is able to activate the battery-operated game by pressing a switch that is attached to her wheelchair.

View or listen to the movie go to: http://natri.uky.edu/assoc_projects/ukat2/at_intro/movies/Mkndra2.mov
Credits

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