The mATHENA inventory of free mobile Assistive Technology applications under the framework of Universal Design for Learning

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Assistive Technology

- *any item, piece of equipment, **software** or product system that is used to increase, maintain, or improve the functional capabilities of individuals with disabilities.*

- includes products and services to help people who have difficulty **speaking, typing, writing, remembering, pointing, seeing, hearing, learning,** walking, etc.

Key issues for AT

- Can be based on Design for All (D4All)/ Universal Design

- AT is incorporated as "accessibility options" in all operating systems of desktop/laptop PCs & mobile devices (tablets/smartphones) *{following D4All}*

- Requires accessibility of the content: web pages and e-files of documents *{following D4All}*

- World Wide Web Consortium (W3C): provides standards and tools for Web accessibility *{following D4All}*

- The major Word processors incorporate accessibility tools *{following D4All}*

Essential Components of Web Accessibility following D4All
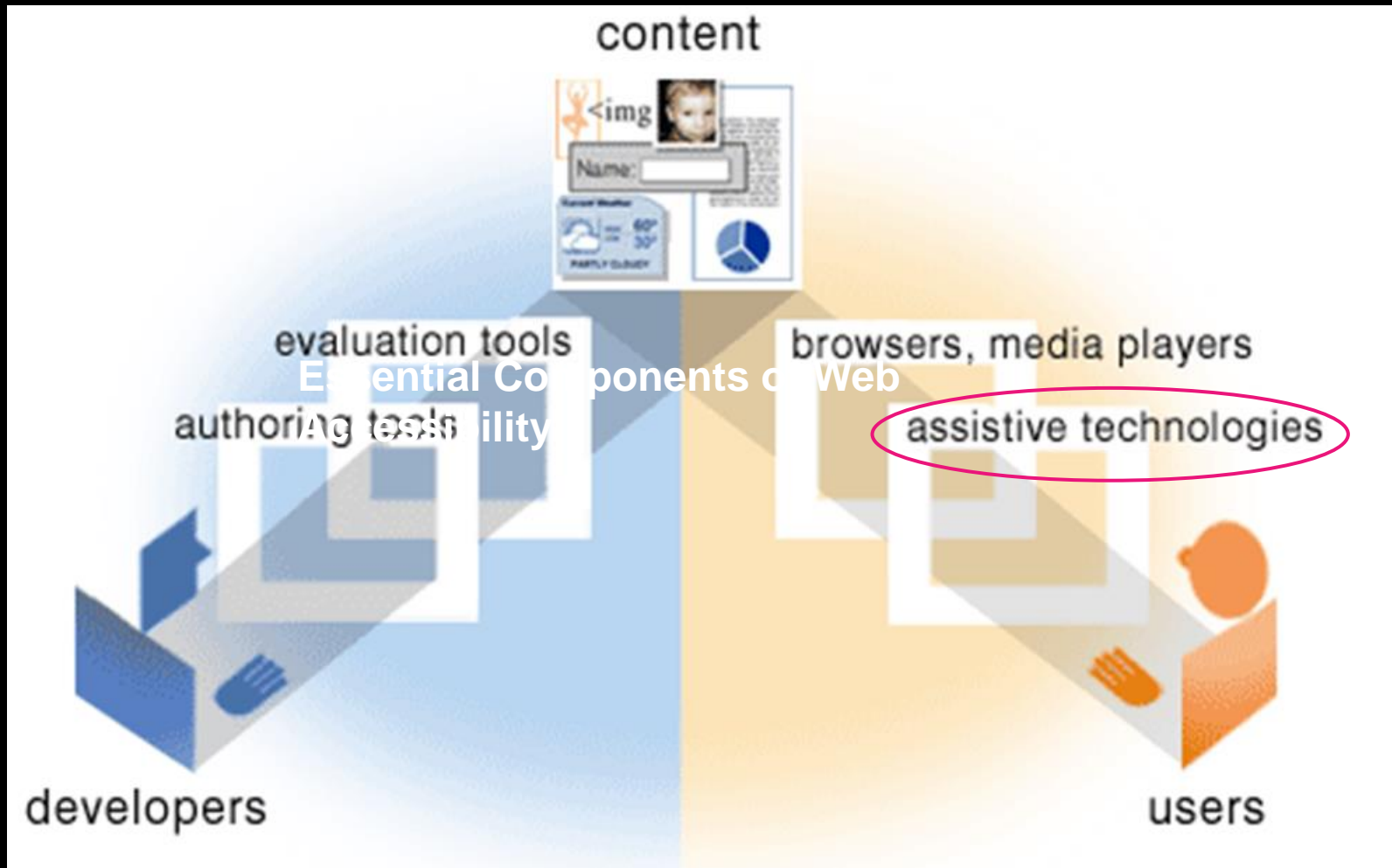
Key findings for AT

- 57% of computer users are likely or very likely to benefit from the use of accessible technology.

- 44% of computer users use some form of accessible technology.

- Users seek solutions to make their computers easier to use, not for solutions based on their health or disability.

- Making accessibility options easier to discover and use will result in computers that are easier, more convenient, and more comfortable for computer users.

Forrester Research, Inc. study report for Microsoft

DAISY: Digital Accessible Information System

- DAISY Consortium was formed in May 1996 by talking book libraries to lead the worldwide transition from analog to Digital Talking Books for the blind

- **ANSI/NISO Z39.86** open standard for people with print disabilities (2005)

- **DAISY** standard merged with **EPUB** 3 (a free standard for general digital books and publications) towards making publications accessible for all (2015)

UDL and D4ALL

- The concept of Universal Design for Learning was inspired by the Design for All approach

- Universal Design or D4ALL calls for "the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design".

Integration of AT and UDL in the classroom: typical example 1

- AT: Specially considered for an individual student with a disability

- UDL: Used for a wide range of students

Tablets and screen readers are provided for all students who are reading below grade level in Mrs Stella's geography course. Peter has an orthopedic impairment and needs a specially designed switch to access his tablet.

Integration of AT and UDL in the classroom: typical example 2

- AT: Utilised by a student with a disability to meet the expectations for the curriculum determined by the IEP (Individualised Educational program) team

- UDL: make the curriculum accessible for students with diverse needs

All students in Mrs Stella's geography class may choose to take examinations on the computer or with paper and pencil. Penelope has a cognitive impairment and takes her modified geography test on her tablet.

Integration of AT and UDL in the classroom: typical example 3

- AT: Decisions about AT are made by special educators and the student's IEP team

- UDL: Decisions are made and implemented by general educators

Mrs Stella utilised the state course of study, state adopted texts and technology to design her UDL geography course. She provided multiple representations of course materials for students to be successful learners. Peter's and Penelope's IEP teams determined the goals and AT they would each need to be successful learners in Mrs Stella's geography class.

UDL and AT

- UDL is not a piece of software or technology, but it based a lot on the technology

- UDL will not eliminate the need for appropriate assistive technology for some disable students

- AT, accessibility options and accessible content benefit more learners

Mobile devices in learning

UNIVERSAL DESIGN FOR LEARNING (UDL)

A Placemat of Core Apps Serving Learning for All 2013 (Version 2)

Barbara Welsford, M.Ed., ATP, ADE bwelsford@eastlink.ca

Multiple Means of Representation of Information

Including students with LD with Reading Difficulties
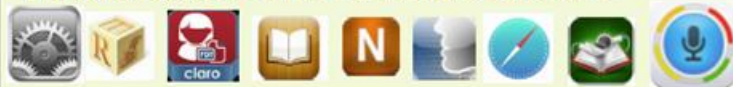
Including students with LD with Written Output Difficulties

Including students with LD with Executive Functioning Difficulties

Including students with Physical Disabilities

Including students with Vision Impairments

Including students with Hearing Impairments

Including students for Early Learning and/or Cognitive Delays / Communication Disorders

UNIVERSAL DESIGN FOR LEARNING

A Placemat of Core Apps Serving Learning for All 2013 (Version 2)

Barbara Welsford, M.Ed., ATP, ADE   bwelsford@eastlink.ca
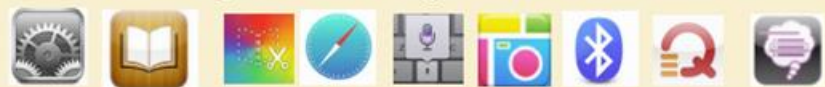
Multiple Means of Expression

Including students with LD with Reading Difficulties

Including students with LD with Written Output Difficulties

Including students with LD with Executive Functioning Difficulties

Including students with Physical Disabilities

Including students with Vision Impairments

Including students with Hearing Impairments

Including students for Early Learning and/or Cognitive Delays / Communication Disorders

UNIVERSAL DESIGN FOR LEARNING
A Placemat of Core Apps Serving Learning for All 2013 (Version 2)
Barbara Welsford, M.Ed., ATP, ADE   bwelsford@eastlink.ca

Multiple Means of Engagement

Including students with LD with Reading Difficulties

Including students with LD with Written Output Difficulties

Including students with LD with Executive Functioning Difficulties

Including students with Physical Disabilities

Including students with Vision Impairments

Including students with Hearing Impairments

Including students for Early Learning and/or Cognitive Delays / Communication Disorders

Rationale for mATHENA

- mobile app stores do not include a category for AT or a classification by disability

- information for each mAT app is not consistent

- no easy way to compare available mAT apps for a specific disability

- cost of mAT apps

  Online mAT software inventories or lists try to address these challenges

Existing Inventories for mAT apps

- **Special Needs Apps**   http://www.friendshipcircle.org/apps/

- **BridgingsApps**   http://bridgingapps.org

- **AppleVis**   http://www.applevis.com

- **Apps for AAC**   http://www.appsforaac.net/

- **AssistIreland**   http://www.assistireland.ie/

- **Low Vision Bureau**   http://www.lowvisionbureau.com

Main features of existing inventories for mAT apps

	a	b	c	d	e	f
Number of apps	357	1.515	150	300	70	326
iOS	YES	YES	YES	YES	YES	YES
Android	YES	YES	NO	YES	YES	NO
Free	YES	YES	YES	YES	YES	YES
Commercial	YES	YES	NO	YES	YES	YES
Searching filters	3	9	3	3	5	1
User rating	YES	YES	NO	YES	NO	YES
User comments	YES	NO	NO	YES	NO	NO
Other				only AAC apps	only for the visual impaired	

a: SpecialNeedApps, b: BridgingApps, c: AppleVis, d: AppsforAAC,
e: AssistIreland , f: LowVisionBureau

Crucial requirements for Inventories of mAT apps

i) to be developed in a systematic way,

ii) to include apps after a selection and evaluation process, preferable by experts in the field

iii) provide a consistent description of all apps

Methodology for the design and development of functional and reliable inventories of mAT apps

- *Search and locate mAT apps*
- *Download and install the apps*
- *Test and evaluate the installed mAT apps*
- *Create a consistent documentation for each app*
- *Design the facilities of the inventory*
  - Searching: a) by disability, b) by the operating system, c) by application category, d) using keywords, and e) alphabetically
  - Rating system and user comments
  - Follow Web Content Accessibility Guidelines (WCAG) 2.0 at least for the level AA of conformance

- *Update and maintain the Inventory*

the mATHENA Inventory of free mAT apps
http://access.uoa.gr/mATHENA

- follows he above methodology

- more than 200 different forums, websites, blogs, newsletters, application stores were explored for mAT candidate apps

- all the apps included in mATHENA have been tested by AT experts of the Speech and Accessibility Lab, University of Athens

mAT apps located, tested, and selected by applying the proposed methodology

	Number	%
Total mobile AT apps located	1.100	100,0
Applications not free of charge	380	34,5
Applications failed to run	35	3,2
Non-AT apps	190	17,3
Applications not supporting the English language	75	6,8
Applications finally selected for mATHENA	420	38,2

Comparison of mATT apps inventories

A	B	C	D	E	F	G	Details for each application
•	•	•	•	•	•	•	Application Name
•	•	•	•	•	•	•	Description
•	•		•		•	•	Manufacturer
•	•	•		•		•	Application Logo
			•			•	Version
•	•					•	Screenshots
						•	System Requirements for App
•	•		•	•		•	Download URL
•			•			•	Developer URL
			•			•	Add Comment
•						•	Languages

A: BridgingApps, B: SpecialNeedApps, C: AssistIreland , D: AppleVis,
E: LowVisionBureau, F: AppsforAAC, G: mATHENA

Comparison of mATT apps inventories

A	B	C	D	E	F	G	
							Inventory features
•	•		•	•		•	Search field
•	•	•	•	•	•	•	Filter Categories
		•				•	Filter Disability
						•	Only Free of charge Apps
•	•					•	Rating System
•	•		•		•	•	Alphabetical List of all Apps
•	•				•	•	Filter Operating System

A: BridgingApps, B: SpecialNeedApps, C: AssistIreland , D: AppleVis,
E: LowVisionBureau, F: AppsforAAC, G: mATHENA

http://access.uoa.gr/mATHENA

University of Athens Department of Informatics

Speech and @ccessibility Lab

National and Kapodistrian **University of Athens**
Department of Informatics and Telecommunications
Speech and Accessibility Lab

mATHENA: Free Assistive Technology Software Inventory for mobile devices (smartphones and tablets)

| Home | All applications | All disabilities | All operating systems | All software categories | Credits | Contact | Login |

Home

Search

General Filters

Disability

- ☐ Blindness [35]
- ☐ Motor Disability [0]
- ☐ Low Vision [91]
- ☐ Hearing Loss [179]
- ☐ Speech Disability [120]
- ☐ Dyslexia [0]

Operating System

- ☐ Android [247]
- ☐ iOS [144]
- ☐ MS-Windows 8 [0]

Category

mATHENA aims to inform and provide persons with disabilities, their facilitators as well as the professionals of the domain, with the available freeware Assistive Technology (AT) applications for mobile devices (smartphones and tablets). mATHENA is complimentary to the **ATHENA Free AT Software Inventory** for computers.

The AT software applications provided in mATHENA are presented in an organized and systematic way after they have been installed and tested in the Speech and Accessibility Laboratory, University of Athens. For each free AT software, the following information is given: application name, developer, version, AT category(ies), related disability(ies), description, operating system(s), installation procedure, settings and hints, download links, and a screenshot.

There are three ways to browse mATHENA:

- **Browse by Disability:** Lists the related applications based on the chosen disability (Speech, Hearing, Motor, Blindness and Low Vision).
- **Lists the applications by the operating system of the device that uses it (Android, iOS).**
- **Browse by Category:** Lists the applications by type of AT software category.
- **Show All Applications:** Lists the whole inventory's applications in an alphabetical order.

Search   🔍

General Filters

Disability

☐ Blindness [35]

☐ Motor Disability [0]

☐ Low Vision [91]

☐ Hearing Loss [179]

☐ Speech Disability [120]

☐ Dyslexia [0]

Operating System

☐ Android [247]

☐ iOS [144]

☐ MS-Windows 8 [0]

Category

☐ Augmentative and Alternative Communication [96]

☐ Book Reader [10]

☐ Braille [11]

☐ Clock - Calendar [1]

☐ Code Reader [5]

☐ Color - Contrast [4]

☐ Communication Code [2]

☐ Daisy [2]

☐ Deaf Community [3]

☐ Entertainment [19]

☐ Games [11]

☐ Hearing Test [3]

☐ Loud Sounds [3]

☐ Magnifier [14]

☐ Medical [10]

☐ Navigation / GPS [10]

☐ News [6]

☐ Note Taker [6]

☐ Notifier [4]

☐ Object Recognition [2]

☐ Screen Reader [2]

☐ Sign Language [80]

☐ Sign Language to Text [1]

☐ Sound Amplifier [24]

☐ Speech Recognition [0]

☐ Speech to Sign Language [3]

☐ Speech to Text [62]

☐ Subtitled Videos [1]

☐ Text Communication [2]

☐ Text to Sign Language [26]

☐ Text to Speech [53]

☐ Translator [17]

In this section, we list the AT applications by the type of AT software category. **Choose your AT software category.**

Filters for All Categories

Disability

- Blindness [35]
- Motor Disability [0]
- Low Vision [91]
- Hearing Loss [179]
- Speech Disability [120]
- Dyslexia [0]

Operating System

- Android [249]
- iOS [143]
- MS-Windows 8 [0]

Apply filters   Clear

Augmentative and Alternative Communication [97]	Text to Speech [53]	Book Readers [10]	Braille [11]	Clock-Calendar [1]	Code Readers [5]
Color-Contrast [4]	Communication Codes [2]	Daisy [2]	Deaf Community [3]	Entertainment [20]	Games [11]
Hearing Test [3]	Loud Sounds [3]	Magnifiers [14]	Medical [10]	Navigation / GPS [10]	News [5]
Note Taker [6]	Notifier [4]	Object Recognition [2]	Screen Readers [2]	Sign Language [80]	Sign Language to Text [1]
Sound Amplifier [24]	Speech Recognition [0]	Speech to Sign Language [3]	Speech to Text [62]	Subtitled Videos [1]	Text Communication [2]
Text to Sign Language [26]	Translator [17]	Typing-Keyboards [0]	Voice Activation [0]	Voice Output [2]	Web Navigation [1]

National and Kapodistrian **University of Athens**
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Speech and Accessibility Lab

mATHENA: Free Assistive Technology Software Inventory
for mobile devices (smartphones and tablets)

| Home | All applications | All disabilities | All operating systems | All software categories | Credits | Contact | Login |

Home ▸ Search Results

Start Prev 1 2 3 4 Next End

Page 1 of 4

Access Note

Rating: Not Rated Yet
☆☆☆☆☆

AFB AW **Access World**

Rating: Not Rated Yet
☆☆☆☆☆

Anxiety Free

Rating: Not Rated Yet
☆☆☆☆☆

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Home | **All applications** | **All disabilities** | **All operating systems** | **All software categories** | **Credits** | **Contact** | **Login**

Home ▸ Browse by Disability ▸ Blindness ▸ Audiobooks

Audiobooks

Back to:

Rating: Not Rated Yet

Webpage: https://itunes.apple.com/us/app/audiobooks/id311507490?mt=8

Developer: Cross Forward Consulting, LLC

Filters for All Disabilities

Operating System

☐ Android [0]
☐ iOS [32]
☐ MS-Windows 8 [0]

Category

☐ Augmentative and Alternative Communication [0]
☐ Book Reader [4]
☐ Braille [7]
☐ Clock - Calendar [0]
☐ Code Reader [0]
☐ Color - Contrast [2]
☐ Communication Codes [0]
☐ Daisy [2]
☐ Deaf Community [0]
☐ Entertainment [10]
☐ Game [3]
☐ Hearing Test [0]
☐ Loud Sounds [0]
☐ Magnifier [1]
☐ Medical [4]

Description

Edition
6.0.1

Category
Book Readers

Description
Audio Books is a podcast library for visually impaired people who are using iOS devices. If user don't have time for an audiobook, he can listen to a Podcast instead. Podcasts are like your own personalized radio station, proving a steady stream of topical, fun episodes to enjoy. Needs registration befora using this.

Languages
English

Operating System Compatibility
iOS 6.0 or later

Installation
Via iTunes

☐ Game [3]	
☐ Hearing Test [0]	
☐ Loud Sounds [0]	
☐ Magnifier [1]	
☐ Medical [4]	
☐ Navigation / GPS [3]	
☐ News [3]	
☐ Note Taker [0]	
☐ Notifier [0]	
☐ Object Recognition [2]	
☐ Screen Reader [1]	
☐ Sign Language [0]	
☐ Sign Language to Text [0]	
☐ Sound Amplifier [0]	
☐ Speech Recognition [0]	
☐ Speech to Sign Language [0]	
☐ Speech to Text [0]	
☐ Subtitled Videos [0]	
☐ Text Communication [0]	
☐ Text to Sign Language [0]	
☐ Text to Speech [0]	
☐ Translator [0]	
☐ Typing - Keyboard [0]	
☐ Voice Activation [0]	
☐ Voice Output [0]	
☐ Web Navigation [0]	

Apply filters Clear

Operating System Compatibility

iOS 6.0 or later

Installation

Via iTunes

Screenshot

The easiest way to enjoy Podcasts yet.

Devices in which we tested the application

iPhone 5s, iPad Air 2

iOS Yes

Compatibility with Greek language No

Android No

Reviews

There are yet no reviews for this app.

Submit Review Be the first to write a review...

First: Rate the product. Please select a rating between 0 (poorest) and 5 stars (best).

★★★★★

Now please write a (short) review....(min. 100, max. 2000 characters)

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Home | **All applications** | **All disabilities** | **All operating systems** | **All software categories** | **Credits** | **Contact** | **Login**

Brighter and Bigger

Back to:

Rating: Not Rated Yet

Webpage: https://itunes.apple.com/us/app/brighter-and-bigger/id452483657?mt=8

Developer: Kazunori Asada

Filters for All Disabilities

Operating System

- ☐ Android [0]
- ☐ iOS [91]
- ☐ MS-Windows 8 [0]

Category

- ☐ Augmentative and Alternative Communication [0]
- ☐ Book Reader [10]
- ☐ Braille [10]
- ☐ Clock - Calendar [1]
- ☐ Code Reader [5]
- ☐ Color - Contrast [4]
- ☐ Communication Codes [0]
- ☐ Daisy [2]
- ☐ Deaf Community [0]
- ☐ Entertainment [18]
- ☐ Game [11]
- ☐ Hearing Test [0]
- ☐ Loud Sounds [0]
- ☐ Magnifier [14]
- ☐ Medical [10]

Description

Edition
2.0.1

Category
Magnifiers

Description
Brighter and Bigger is a magnifying glass suitable for low vision people, who have problems recognizing items or texts. Using the device camera you can read small letters in printed text. This app can magnify up to 20 times the text. It is easy to use and accessible with VOICEOVER.

Languages
English, Japanese

OperatingSystem
Requires iOS 5.0 or later

Installation
via App Store

☐ Magnifier [14]
☐ Medical [10]
☐ Navigation / GPS [10]
☐ News [6]
☐ Note Taker [0]
☐ Notifier [0]
☐ Object Recognition [2]
☐ Screen Reader [2]
☐ Sign Language [0]
☐ Sign Language to Text [0]
☐ Sound Amplifier [0]
☐ Speech Recognition [0]
☐ Speech to Sign Language [0]
☐ Speech to Text [0]
☐ Subtitled Videos [0]
☐ Text Communication [0]
☐ Text to Sign Language [0]
☐ Text to Speech [1]
☐ Translator [0]
☐ Typing - Keyboard [0]
☐ Voice Activation [0]
☐ Voice Output [2]
☐ Web Navigation [1]

Apply filters   Clear

Installation
via App Store

Screenshot

Devices in which we tested the application
iPad Air 2, iPhone 5s

iOS   Yes

Compatibility with Greek language   No

Android   No

Reviews

There are yet no reviews for this app.

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First: Rate the product. Please select a rating between 0 (poorest) and 5 stars (best).

⭐⭐⭐⭐⭐

Now please write a (short) review....(min. 100, max. 2000 characters)

Characters written: 0

Submit Review

Future plans

- to extend mATHENA by adding more languages, such as German and Spanish

- to include apps related to new innovations in mobile technologies, both in hardware (e.g. smartwatch) and software that can benefit the disabled and elderly

- Use mATHENA in the framework of UDLnet validation phase

http://access.uoa.gr/mATHENA

Thank you !