

A.S. Drigas, L.G. Koukianakis, Y.V. Papagerasimou

“An electronic environment to support sight disabilities”

This article presents an electronic environment, which supports e-psychology activities for the needs of individuals with visual impairments, through the usage of Information and Communication Technologies (ICT) tools and services. E-psychology engages in activities such as teaching, learning, supporting, consulting, intervention and interview, aiming at enhancing the skills and smoothing the handicaps of these people. Through the efficient usage of ICT tools and services, such e-psychology environments, analyze and understand in full the handicaps of the visually impaired, achieving hence to cover both their special and communicative needs. This ensures their equal access to information, knowledge, education and employment. Moreover, this electronic environment complies with the “Design for All” and “Universal Accessibility” principles, rendering it user-friendly, flexible and adaptive. In addition, “Assistive” technology was embedded within the system to support the e-inclusion of this special group. Such technology includes Braille terminals, screen readers, screen magnifiers, speech synthesizers, and voice/audio input software. Furthermore, the environment supports both synchronous and asynchronous activities of teaching-learning via communicative and informative tools and services, which can be adapted to support various methods of teaching-learning. Finally, the environment supports self-study learning as well as teacher moderated study via audio conference usage.



26th
International
Congress of Applied
Psychology

July 16-21, 2006 - Athens, Greece

International Association of Applied Psychology
Hellenic Psychological Society - Association of Greek Psychologists

Under the aegis of the President of the Hellenic Republic, Mr. Karolos Papoulias

“An Electronic Environment to Support Sight Disabilities”

Authors:

Dr. Athanasios Drigas

Mr. Leyteris Koukianakis

Mr. Yannis Papagerasimou

Presentation by Mr. Yannis Papagerasimou

Net Media Lab - I.I.T. of N.C.S.R. “DEMOKRITOS”

<http://imm.demokritos.gr>



26th
International
Congress of Applied
Psychology

July 16-21, 2006 - Athens, Greece

International Association of Applied Psychology
Hellenic Psychological Society - Association of Greek Psychologists

Under the aegis of the President of the Hellenic Republic, Mr. Karolos Papoulias

“Subject”

**An electronic environment which supports
e-psychology activities for the needs of
individuals with Sight Disabilities through the use
of ICT tools and services**



26th
International
Congress of Applied
Psychology

July 16-21, 2006 - Athens, Greece

International Association of Applied Psychology
Hellenic Psychological Society - Association of Greek Psychologists

Under the aegis of the President of the Hellenic Republic, Mr. Karolos Papoulias

E-Psychology Activities

E-Psychology engages in activities such as:

Teaching - Learning - Support - Consulting - Intervention - Interview

Psychology studies state that individuals with visual impairments have their **other senses upgraded (touch & hearing)** which in a way replace & fill in for the lack of or low eyesight. Unfortunately though, the use of one of the aforementioned senses is not adequate enough. It is essential that the visually impaired use a combination of the alternative sensory routes for better results



**26th
International
Congress of Applied
Psychology**

July 16-21, 2006 - Athens, Greece

International Association of Applied Psychology
Hellenic Psychological Society - Association of Greek Psychologists

Under the aegis of the President of the Hellenic Republic, Mr. Karolos Papoulias

E-Psychology Environment Aims

- Analyze & understand in full the handicaps of the Visually Impaired through the efficient use of ICT tools & services in order to **enhance their skills & smooth their handicaps**
- Cover both their **special & communicative needs** by redirecting the information through other sensory routes (**touch & hearing**)
- Ensure their access to:

‘Information - Knowledge - Education - Employment’



**26th
International
Congress of Applied
Psychology**

July 16-21, 2006 - Athens, Greece

International Association of Applied Psychology
Hellenic Psychological Society - Association of Greek Psychologists

Under the aegis of the President of the Hellenic Republic, Mr. Karolos Papoulias

E-Psychology Environment

The e-environment complies with the following principles:

- **Design for All**
- **Universal Accessibility**

Through the use of **4 Special Access Methods & Assistive Technology**

In order to be:

User-Friendly - Easily Navigable - Flexible - Adaptive



26th
International
Congress of Applied
Psychology

July 16-21, 2006 - Athens, Greece

International Association of Applied Psychology
Hellenic Psychological Society - Association of Greek Psychologists

Under the aegis of the President of the Hellenic Republic, Mr. Karolos Papoulias

E-Psychology Environment (2)

The e-psychology environment supports:

- Both **synchronous** & **asynchronous** activities of teaching - learning through informative and communicative tools & services, which can be adapted to support various methods of teaching - learning
- **Self-Study** learning as well as **teacher moderated** study via audio conference usage



**26th
International
Congress of Applied
Psychology**

July 16-21, 2006 - Athens, Greece

International Association of Applied Psychology
Hellenic Psychological Society - Association of Greek Psychologists

Under the aegis of the President of the Hellenic Republic, Mr. Karolos Papoulias

Assistive Technology

The environment incorporates assistive technology to support the e-inclusion of the visually impaired. Such technology includes:

- **Braille Terminals:** Hardware which displays a large percentage of what is displayed on the screen & which is refreshed very often as the user moves on the screen
- **Screen Readers:** Software program that reads the content of the screen aloud to the visually impaired user
- **Screen Magnifiers:** Software program that magnifies a portion of the screen
- **Speech Synthesizers & Voice/Audio Input Software:** Both work in conjunction with graphical desktop browsers



26th
International
Congress of Applied
Psychology

July 16-21, 2006 - Athens, Greece

International Association of Applied Psychology
Hellenic Psychological Society - Association of Greek Psychologists

Under the aegis of the President of the Hellenic Republic, Mr. Karolos Papoulias

E-Psychology Environment Special Access Interfaces

The e-psychology environment is based on **multiple access interfaces** to make it user friendly & easily navigable for the visually impaired individuals, in order to ease their integration to ICT. The **4 Special Access Interfaces** are:

- Interface for Audio Navigation
- Interface for Common Citizens
- Graphics Enlargement Interface
- Interface for Braille Terminal or Screen Reader



**26th
International
Congress of Applied
Psychology**

July 16-21, 2006 - Athens, Greece

International Association of Applied Psychology
Hellenic Psychological Society - Association of Greek Psychologists

Under the aegis of the President of the Hellenic Republic, Mr. Karolos Papoulias

Main Interface of the E-Psychology Environment

Multi-Purpose E-Environment for People With Sight Disabilities Main Interface



Interface for
Audio Navigation



Interface for
Common
Citizens



Graphics
Enlargement
Interface



Interface for
Braille Terminal or
Screen Reader



26th International Congress of Applied Psychology

July 16-21, 2006 - Athens, Greece

International Association of Applied Psychology
Hellenic Psychological Society - Association of Greek Psychologists

Under the aegis of the President of the Hellenic Republic, Mr. Karolos Papoulias

Interface for Common Citizens

The non-disabled interested users may navigate through the information of the e-environment through columns of links as happens in a normal web portal. In particular, this interface is mainly addressed to the **trainers** as well as the **family members of the visually impaired users**. This page consists of four units namely:

- The unit "**Technology**", which contains information about technological supportive tools for individuals with visual and mobility impairments.
- The unit "**Information**", which contains information that interests disabled people.
- The unit "**Organizations**", which contains information about all the institutions and organizations related with disabilities in Greece
- The unit "**Multimedia**", which contains educational and recreational material for both the disabled people as well as their trainers.

Multi-Purpose E-Environment for People With Sight Disabilities

			
Technology	Information	Organizations	Multimedia
▶ Braille Terminals	▶ Bibliography	▶ Epikoinonia	▶ Video
▶ Supportive Tools	▶ Magazines	▶ Ammimoni	▶ Video on Demand
▶ Screen Readers	▶ Hellenic Links	▶ Institutions	▶ Audio Books
▶ Special Browsers	▶ Foreign Links	▶ Schools	▶ Music Links
	▶ Medical Guide		▶ Teleconference
			▶ DataBase

 **Demokritos**
National Centre for Scientific Research



Interface for Audio Navigation

The visually impaired individual is navigated through **audio messages** (Real Audio) to **audio information** only. The navigation through the pages is realized by pressing the keys according to the instigation of the corresponding audio message. The keys that are used are:

- “**enter**” to return to the main interface
- “**space**” for returning to previous pages
- “**1-9**” for the navigation through the pages

Once the interface is loaded, an audio welcome and navigation message is heard.

You Are In The Audio Navigation Interface

If You Wish To Return to the
Main Interface With The Access Interfaces
PRESS SPACE

If You Wish To Get Informed On
Technologies for People With Sight Disabilities
PRESS 1

For General Information PRESS 2

If You Wish to Get Informed on
Organizations for People With Sight Disabilities
PRESS 3

For Audio Books PRESS 4



26th International Congress of Applied Psychology

July 16-21, 2006 - Athens, Greece

International Association of Applied Psychology
Hellenic Psychological Society - Association of Greek Psychologists

Under the aegis of the President of the Hellenic Republic, Mr. Karolos Papoulias

Graphics Enlargement Interface

Through the installation of a special Flash Player plug-in, the user may enlarge both the graphics and the text. The enlargement process, which is given sonically by navigating the user to the corresponding interface, is realized by right clicking the mouse and choosing zoom in. This interface's capability is due to the special design of the web pages using the **Macromedia Flash 5** tool. This interface offers almost all the information of the common interface except for some multimedia applications, which could not be used by severe cases of visually impaired individuals.

Multi-Purpose E-Environment for People With Sight Disabilities

Technology Information Organizations Multimedia

- ▶ Braille Terminals
- ▶ Supportive Tools
- ▶ Screen Readers
- ▶ Special Browsers
- ▶ Bibliography
- ▶ Magazines
- ▶ Hellenic Links
- ▶ Foreign Links
- ▶ Medical Guide
- ▶ Epikoionia
- ▶ Ammimoni
- ▶ Institutions
- ▶ Schools
- ▶ Video
- ▶ Video on Demand
- ▶ Audio Books
- ▶ Music Links
- ▶ Teleconference
- ▶ DataBase

 **Demokritos**
National Centre for Scientific Research



**26th
International
Congress of Applied
Psychology**

July 16-21, 2006 - Athens, Greece

International Association of Applied Psychology
Hellenic Psychological Society - Association of Greek Psychologists

Under the aegis of the President of the Hellenic Republic, Mr. Karolos Papoulias

Interface for Braille Terminal or Screen Reader

Multi-Purpose E-Environment for
People With Sight Disabilities

Technology Links

[Braille Terminals](#)

[Supportive Tools](#)

[Screen Readers](#)

[Special Browsers](#)

Information Links

[Bibliography](#)

[Magazines](#)

[Hellenic Links](#)

[International Links](#)

The information that the user finds is the Common and Graphic Enlargement Interfaces is in **plain text format with a large font** in order to be able to easily use either a Braille Keyboard or a Screen Reader. This is because the graphics impede the use of the aforementioned tools and hence, it is essential to have a **simple environment**. In addition, this interface contains all the information of the Common Interface and has been designed in such a way, in order to collaborate with a **Hellenic Screen Reader** and a **Braille Terminal**, which serve the educational needs of the visually impaired by accessing the network environment.



**26th
International
Congress of Applied
Psychology**
July 16-21, 2006 - Athens, Greece

International Association of Applied Psychology
Hellenic Psychological Society - Association of Greek Psychologists

Under the aegis of the President of the Hellenic Republic, Mr. Karolos Papoulias

Pilot Project

- Developed and Designed within the **National Framework for Disabled Individuals**
- **First e-psychology environment in Greece** - No other competitive product that incorporates multiple ways of supported navigation to e-content exists in the Hellenic Market
- Collaboration with the Hellenic Organization for the Greek Blind Individuals '**Faros**' for the design of the e-environment
- Pilot implementation for **3 months**
- Distinguished among disabled user communities during a National Conference as a **unique concept project**
- Positive experiences and reviews by the visually impaired users due to the number of provided access methods



Conclusions

With the aid of ICTs communication is possible for a visually impaired individual

Need to:

- Fully understand the handicaps of the visually impaired people
- Adapt technology to the needs of the visually impaired people
- Choose most appropriate and suitable technologies depending on the nature of their disability

In order to:

- Make the visually impaired active members of the Information Society
- Cover their special & communicative needs
- Ensure their equal access to: Information - Knowledge - Education - Employment



26th
International
Congress of Applied
Psychology

July 16-21, 2006 - Athens, Greece

International Association of Applied Psychology
Hellenic Psychological Society - Association of Greek Psychologists

Under the aegis of the President of the Hellenic Republic, Mr. Karolos Papoulias

“An Electronic Environment to Support Sight Disabilities”

Authors:

Dr. Athanasios Drigas

Mr. Leyteris Koukianakis

Mr. Yannis Papagerasimou

Presentation by Mr. Yannis Papagerasimou

Net Media Lab - I.I.T. of N.C.S.R. “DEMOKRITOS”

<http://imm.demokritos.gr>