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# eInclusion @ Cyprus Universities: Provision and Web Accessibility

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**Abstract**

This paper presents part of a work-in-progress that aims to discuss issues of accessibility in higher education regarding equal opportunities in the use and access of information and technology for students with disabilities in Cyprus. All Cypriot university Websites have been examined using accessibility evaluation techniques and the provisions made by the higher education officers for equal access to their university websites have been reviewed. The results showed that all university pages show accessibility problems, with the public ones having the least errors. With respect to provisions, results showed that internal regulations and policy of universities did not include any specific provisions for web or other technology accessibility.

**Keywords**

Web Accessibility; Higher Education; Provision; Evaluation

**ACM Classification Keywords**

H.5.1 [Information interfaces and presentation (e.g., HCI)]: Evaluation/methodology; K.4.2 [Social Issues]: Assistive technologies for persons with disabilities

**General Terms**

Design, Human Factors, Legal Aspects

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## Introduction

Accessibility to and of technology, especially in the internet era, implies different types of physical and digital design. These not only refer to specialized interface devices often referred to as assistive technology (AT), but also to the accessibility of the web itself [10]. Development of accessible technology is facilitated or impeded by policy as well as by the way any policy is transferred to awareness and practice. According to Kemppainen [5], interest in policy and legislation of technology and disability can be seen to have emerged in the 1980s. Published research usually concerns developments on a more general international and European level. However, in reality, developments in macro-level, aim to influence policy and practice at a micro-level (i.e. individual countries), in order to succeed change. Hence, it is also interesting to study this transfer, and how it can affect technology and disability legislation, development and awareness.

This paper is part of a greater work-in-progress research project examining access in higher education from the point of view of technology. The aim of the study is to examine how EU policies are incorporated into a small country's provision laws/guidelines and how are these implemented in the level of tertiary education. Universities and their websites that are not accessible may exclude people with disabilities from participation in educational, social and professional activities. Being a small country, Cyprus gives the opportunity to study in detail the whole island's university level institutions and examine if and how guidelines and provisions can become actual practice in order to promote educational and social inclusion in higher education.

## Background

Accessibility for information on the Web has been well regulated in the United States and the European Commission. The European approach to ensuring the availability of accessible information on public Web sites is encapsulated in the eEurope Action Plan 2002 which emphasises that, "Public sector web sites...must be designed to be accessible to ensure that citizens with disabilities can access information and take full advantage of the potential for e-government" [2]. University web sites play a crucial role in the day-to-day lives of students. Use of the Web is quickly becoming a required part of university life as they contain important information about academic resources, campus events, and administrative policies. Other accessibility studies [6, 4] found that universities were not compliant with the accessibility standards and usually simple issues were the most often failures.

Unfortunately the Cypriot legislature is not yet in line with the European action plan on the issue of web accessibility. There are no specific legislative or regulatory measures regarding eAccessibility for public or private websites in Cyprus [3]. However, Article 16 of the new EU Structural Funds regulations is expected to have an impact on eAccessibility and as Cyprus has signed the Convention, now Article 9 sets forth the obligation of the country to ensure accessibility to the Internet. However, since it is not a legislation, issues of accessibility and technology do not seem to be officially directed by the Cyprus government, at any level of education or other sectors [7].

As per inclusion in Cyprus, it was planned that within 2010, these sites would be further enhanced based on WCAG 2.0, level AA [3]. To our knowledge, only one previous study (in 2001) has analyzed Cypriot web sites

with respect to accessibility via automated testing on WCAG1.0 [10]. The results showed that the Cyprus websites, including academic websites, were ranked very low in terms of accessibility (only 20% of them were Bobby approved). Ten years afterwards, the present study, aims to investigate the accessibility of new technologies in universities, after Cyprus joined the EU where signed relevant conventions and documents. This paper focuses on web accessibility of universities against the WCAG2.0 and the provisions taken by these universities.

### Methodology

The study was conducted in two parts: Web Accessibility Evaluation and University Accessibility Provision. All seven (7) Cyprus Universities (3 public and 4 private) were selected to examine the current state of web accessibility in the Cypriot higher education system.

**Web Accessibility Evaluation** Our study methodology was based on the W3C Preliminary review for accessibility [8] and utilized both automated and manual tests in order to capture a broad range of accessibility issues: Graphical Browser Testing, Validation Testing and Manual/Expert Evaluation. The multi-method accessibility survey was conducted on 5 pages for each of the 7 universities websites: Homepage, Student Welfare, Departmental Page (Computer Science or other similar), News-Announcements and Library. Our primary goals were to identify the common and most important accessibility issues presented on university web pages. Due to the restricted paper format only the results of the evaluation of each university homepage will be presented.

The tools used to follow the steps described on the W3C Review for accessibility [8] were the Web Developer<sup>1</sup> and

<sup>1</sup>Web Developer-<http://chrispederick.com/work/web-developer/>

Juicy Studio Accessibility<sup>2</sup> Firefox plugins. In addition, the aDesigner<sup>3</sup> tool was used as a disability simulator which shows how the content is accessible and usable by the visually impaired. It also shows a number of errors based on WCAG2.0 but because most of the guidelines need manual check it only notifies the Web developer of the possible number of errors including the ones that need human check. For the *Validation Testing*, each university homepage's XHTML<sup>4</sup> and CSS<sup>5</sup> codes were tested using the respective W3C validation services. For each page tested the number of errors was recorded. The *Expert Evaluation* was based on the 4 principles of WCAG2.0 [9]: 1. Perceivable, 2. Operable, 3. Understandable, and 4. Robust. Each of the principles were examined based on the WebAIM checklist<sup>6</sup>. It is important to clarify here that only the guidelines that can be checked manually without the need of a user were examined and presented in this paper. Further evaluation is planned for the next stages of the project.

**University Provisions** Data about accessibility provisions was collected through interviews with officers of student affairs and welfare department of each university. Interview questions focused on existing provisions and regulations about equal web and other technology access for all students. Some officers directed these questions to the Information Service Technology departments.

### Results

**Web Accessibility** The evaluation revealed that none of the Cypriot universities passed all the tests performed since all demonstrated accessibility errors. Tables 1 and 2

<sup>2</sup>Juicy Studio Accessibility-<http://juicystudio.com/>

<sup>3</sup>IBM aDesigner <http://www.eclipse.org/actf/downloads/tools/aDesigner/>

<sup>4</sup>XHTML Validator <http://validator.w3.org>

<sup>5</sup>CSS Validator <http://jigsaw.w3.org/css-validator>

<sup>6</sup>WebAIM <http://webaim.org/standards/wcag/checklist/>

list the results for the graphical and automatic evaluation for the university homepages respectively.

**Table 1:** Graphical Browser Test Results

Page	TurnOff Images	TurnOff Sound	Change FontSize
Univ 1**	AP*	N/A*	Fail
Univ 2**	Fail	N/A	Fail
Univ 3**	AP	N/A	Fail
Univ 4	Fail	N/A	Fail
Univ 5	AP	N/A	Fail
Univ 6	Fail	N/A	Fail
Univ 7	Fail	N/A	Fail

Page	Grayscale	No mouse	Scripts
Univ 1	Fail	Fail	Fail
Univ 2	AP	Fail	Fail
Univ 3	Fail	Fail	Pass
Univ 4	Fail	Pass	Pass
Univ 5	Fail	Fail	Fail
Univ 6	Fail	Fail	Fail
Univ 7	Fail	Fail	Fail

\* AP- Almost Pass, N/A - NonApplicable; \*\*Public University

The graphical evaluation showed that all universities fail to meet some of the most basic accessibility, such as ALT text, absolute font size and scripting errors. Some pages Almost Passed (AP) the test for the missing ALT text, meaning that the page requires some minimal work to be accessible and pass. For example, there were only a couple of images that did not provide the alternative text. In addition, the information and text was overlapping when the user would increase the font size. Navigating without mouse failed mainly because the user was traversing in “blind” as it was not shown where the user was located on the page and also there were a lot of hidden information.

**Table 2:** Automatic Tool Results

University	XHTML	CSS	Colour Contrast	aDesigner*
Univ 1	175	11	20	118 (16)
Univ 2	4	2	37	109 (9)
Univ 3	14	0	55	95 (1)
Univ 4	32	6	14	96 (7)
Univ 5	146	344	53	tool error
Univ 6	299	error	26	244 (27)
Univ 7	6	3	20	72 (8)

\*The parenthesis lists the number of errors that the tool can automatically identify without the need of human check

The automatic testing also showed that the university homepages do not comply to the accessibility regulations. Table 2 lists the number of errors that each test generated. Only Univ 3 passed one of the tests (CSS), and this was a public university with the least information compared to the other pages. According to the automated testing, all of the Cypriot universities’ homepages were non-compliant with WCAG. It is important to note that passing or failing automated testing does not mean that a page meets all the WCAG’s accessibility requirements, since there are guidelines that need to be human judged. However, it is indicative of whether a page is close to be accessible or meets some standards.

The manual evaluation was based on the authors’ expert knowledge of accessibility evaluation. In order to provide a coherent evaluation, the evaluators used the WebAIM checklist. Table 3 lists the guidelines evaluated and the results for each of the university homepages. Some of the most common failures were the lack of the language identification in the XHTML, the missing ALT text or the need of null alt text so the images can be skipped when they are decorative. In addition all universities used absolute measurements and no label elements for form

Table 3: Manual Evaluation Results

WCAG 2.0 Guidelines	Univ 1	Univ 2	Univ 3	Univ 4	Univ 5	Univ 6	Univ 7
Guideline 1.1 Text Alternative	Fail	Fail	AP	Fail	Fail	Fail	Fail
Guideline 1.2 - Time-based Media	Fail	Fail	N/A	N/A	Fail	Fail	N/A
Guideline 1.3 - Adaptable	Fail	Fail	AP	Fail	Fail	Fail	AP
Guideline 1.4 - Distinguishable	Fail	Fail	Fail	Fail	Fail	Fail	Fail
Guideline 2.1 - Keyboard Accessible	Pass	Fail	Pass	Fail	Fail	Fail	Fail
Guideline 2.4 - Navigable	Fail	Fail	Fail	Fail	Fail	Fail	Fail
Guideline 3.1 - Readable	AP	Fail	AP	Fail	Pass	Pass	Fail
Guideline 3.2 - Predictable	Pass	Fail	AP	AP	AP	Pass	Pass
Guideline 4.1 - Compatible	Fail	Fail	Fail	Fail	Fail	Fail	Fail

control. Some pages also did not use proper headings nesting which makes it difficult to traverse using assistive technologies (AT). As the table shows, Univ 3 is the only homepage evaluated that Passed or Almost Passed the accessibility testing.

**University Provisions** Interviews and documentation data analysis showed that two of the three public universities did not form their own regulations for the support of students with disabilities. Their policy and practice is based on the current legislation of the Ministry of Education and Culture and the Ministry of Labour and Social Insurance. The rest of the universities do have their own regulations as internal policy. These include some provisions for physical and cognitive accessibility as well as access to technology. The officers mentioned that the universities' internal policy refers to the following types of technology accessibility: (i) AT on loan and/or by other organizations (ii) AT in libraries (mainly for VI) (iii) No web accessibility provisions

All provisions described in the universities internal regulations are extracted from the N13(I) of 1999 Education Act, which has not been modified since 2001[1]. Based on the Education Act, no special indication is made

about accessible internet and other accessible and/or AT, or to any newer European or other conventions and guidelines, such as e-Inclusion plan, WCAG 2.0, eEurope Action plan 2002 or the latest version of the convention and N8(III) of 2011 Law. All interviewees mentioned that their provisions are focused on issues of physical access (mobility) and facilitations in exams, mostly regarding the support by personal assistants.

As the accessibility evaluation showed, there is no indication regarding web accessibility provision in any of the universities' written policy. During the interviews only one of the interviewees of a public university has mentioned the provision of accessible websites. The rest of the participants mentioned that they do recognise the need of accessible websites and some of them referred to characteristics such as colour contrast and simple design. However, when asked if their university has taken into consideration any accessibility issues, responses included: "I do not know", "there was no need till today", "there is no special design taken into account for students with special needs to our university's website".

The only participant that referred to web accessibility characteristically mentioned that "our website is designed

according to WCAG 2, AA. There are also efforts for readable and clear content for any materials uploaded by instructors, through the MIS department who is responsible for this". It is worth mentioning that this particular university is offering distance learning courses and the web accessibility results showed that this was the only university that had the most Pass or AlmostPass scores (Univ 3, Table 3).

### Discussion and Conclusions

Access and equity in higher education is a complicated discipline related to social, economical, technological and political developments in a country. The results of this work-in-progress demonstrate that none of the Cypriot universities follows accessibility regulation for their websites but also there is no provisions for web accessibility. The web accessibility failures are common to all the universities and are missing alternative text, use of absolute measurements (sizing and fonts), colour contrast, errors in coding making the content incompatible with AT, the content is unstructured, there is information hidden, missing and difficult to find.

As shown from the automatic testing, the number of errors on each page is positively related to the number of information, visual elements and flash object of the page which shows that the more visually oriented a page is the more accessibility errors generated. The websites of the private universities are less accessible as they use flash elements for visual attraction and for marketing purposes.

A preliminary interpretation of findings about policy and design may lead to considerations about lack of awareness of both the designers and developers as well as the competent university agents who define the specifications and requirements of each university's website. This

project will continue by conducting further user evaluations using university students with and without disabilities. Training will also be provided to involved agents in the form of information and awareness days. In this way, the universities will be informed on the improvements that need to be done on their websites but also for the provisions that need to be reformed based on all students' needs.

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