SUMMARY

People with mobility impairments, visual, hearing, speaking and intellectual disabilities, often face barriers in accessing the Universities' built environment and services. Although the right to education is considered fundamental, the accessibility of educational institutions, and of higher education ones in particular, leaves a lot to be desired. The growing number of students with disabilities was helped in Greece by the implementation of the 3794/2009 law. This law allows students with disabilities to enter University schools in a percentage of 5% without taking the normal accession exams, makes the study of their needs essential.

In this paper an approach for the evaluation of the accessibility of the physical infrastructure and the educational process in Universities is presented. A brief introduction of the concept of disability is made and the notion of accessibility and its particular implications concerning higher education is presented. Following this, a methodology for assessing the accessibility level is presented which includes the evaluation of open spaces, buildings as well as the educational procedure itself. This was devised after the "tasks" (everyday activities students perform) and the associated to them "needs" were determined. These were divided into various subtasks, the problems students with disabilities face in each task were recognized and the particular requirements they have were categorized and presented. The determination of tasks, combined with in situ observation of the use of infrastructure, communication with experts specialised in accessibility as well as relevant literature led to the creation of structured checklists which were applied in the Aristotle University of Thessaloniki campus. These processes, and the results of the application of the devised methodology, are also presented in this paper.

Key Words: accessibility; Universities; methodology
PURPOSE OF THE STUDY

The purpose of this study was the development of a methodology for the evaluation of accessibility of Universities and its implementation at the Aristotle University of Thessaloniki (AUTh), Greece.

In order to examine the accessibility offered in educational premises, it was decided that two major issues should be examined.

The first one concerns the accessibility of the mobility chain and infrastructure for people with disabilities, as well as the provision of equal services. This means that the accessibility of open spaces, public transport, buildings, services and information provision should be examined too.

The second major issue is the accessibility of the educational process itself. This includes attending lectures, studying, taking exams, other assessment methods etc. [Naniopoulos and Tsalis, 2008; Christofi, 2005]

METHOD

People with mobility, visual, hearing or speech impairments often face barriers in accessing the Universities' built environment and services. Barriers include inaccessible physical environment, lack of relevant assistive technology, as well as inaccessible services, systems and policies.

The International Classification of Functioning, Disability and Health [ICF, 2001] defines disability as “the outcome or result of a complex relationship between an individual's health condition and personal factors, and of the external factors that represent the circumstances in which the individual lives”. Thus, disability results from an interaction between a non-inclusive society, environment and individuals.

It should also be noted that in the designing process the needs of people with restricted mobility (which includes pregnant women, small children, elderly people etc.) should be taken into account too. According to the Greek Ministry of Environment, Land Planning, and Public Works [MELPPW, 2003], people with mobility constraints reach around 48% of the total population.

It has already been mentioned that, in higher education, accessibility concerns both the transport chain and the educational process itself. To evaluate these, initially the needs of people with disabilities in the transportation system and the educational procedure were determined. This led to the creation of a task model which was constructed through communication with students with disabilities, associations of people with disabilities, in situ observation of the use of infrastructure, communication with experts specialised in accessibility as well as through relevant literature [DfT, 2002; 2007; RNIB,1995; TSRG,2005; GMEPW,2003; ADAAG,1992]. This process then led to the creation of structured checklists for accessibility evaluation of both the infrastructure and the educational procedure. The checklists were created so that the auditor would not have to be specialized in accessibility. [Tsalis & Naniopoulos, 2008]
The use of the lists facilitates the systematic identification of obstacles and evaluation of infrastructure in terms of their accessibility. Such a systematic approach for identifying and recording various obstacles, including their location, geometry and nature, is a fundamental prerequisite for developing proposals for their elimination.

The first checklist concerns open spaces (walkways and sidewalks, parking spaces, other outdoor facilities). For the field survey, the research area was subdivided into certain zones, in which all surfaces, facilities and equipment were coded and obstacles were marked on the maps. The following areas were examined:

- Main pedestrian walkways and sidewalks
- Secondary walkways and sidewalks
- Parking spaces
- Rest areas and other open spaces
- Recreation spaces
- Facilities and Equipment

The list includes various groups of “structural elements” which may function as obstacles, such as:
- “bridging” different levels
- surface of sidewalks/walkways
- walking routes
- equipment of sidewalks/walkways and signage (pedestrian crossings, bus stops etc.)
- access to public buildings
- organization of the environment etc.

In total 408 points of interest are examined in the checklist.

In the second checklist, interior spaces of buildings are surveyed. The list includes various groups of “structural elements” of the buildings which may function as obstacles. The checklist created has a very analytical form in order to be easy to use, not only from designers, planners, and engineers but from the building’s employees and visitors as well. Thus, the data collected can be easily updated.

The checklist is composed of nine main sections with main headings as follows:

1. General information
2. Entrances (approach, stairs/ramps, doors)
3. Circulation (horizontal and vertical movement) with subsections for horizontal and vertical movement
4. Services/Equipment (restrooms, toilets, showers, service equipment)
5. Emergency cases (emergency exits, alarms and alert systems, evacuation)
6. Signage
7. Acoustics
8. Lighting
9. Closed spaces with subsections for educational/ academic /employee rooms and halls, classrooms, labs, studios, offices, etc.

In total 433 points of interest are examined in the checklist.
Finally, the access to educational procedure, consisting of teaching material, lecture organization, programming and equipment is evaluated. The checklist is based on the needs of students with disabilities in the educational procedure. and is focused on the educational procedure itself, thus it does not include topics related to physical accessibility. The following aspects of the educational procedure are examined:

- General services (medical services and specialists accessible, sport teams and training targeted to people with disabilities, all information concerning educational activities, books and other material provided in alternative forms, etc.)
- Attending lectures (possibility to use assistive technology in class, provision of sign language interpreter etc.)
- Assessment of the student’s knowledge of each subject (presenting essays and thesis in alternative formats, adaptation of terminology with the help of a sign language interpreter etc.)

In total 95 points of interest are examined in the checklist [Tsalis et al., 2008]

**RESULTS**

The methodology was applied in AUTh during 2009 – 2010 in the frame of the ACTUS project which was a collaboration between the Transport Systems Research Group of the Aristotle University of Thessaloniki in Greece and the University of Mersin in Turkey and financed by Central Finance and Contracts Unit (CFCU) which was established by a Memorandum of Understanding signed between EU Commission and Turkish Government. The same methodology was applied during a graduate thesis at the AUTh Civil Engineering Department. The Accessibility Office for People with Disability of AUTh assisted in both cases. In total 26 buildings and 4 kms. of routes inside the University campus were assessed with more than 500 points of interest identified. Individual assessment essays were created for each building and route and the obstacles identified were part of information provided on a GIS database. [Tsalis et al., 2009; Ismail Oglou et al., 2010]

Main objectives were:

- To obtain a clear picture of the existing problems and obstacles in the University campus open spaces and buildings.
- To apply the checklist developed in order to obtain a systematic view of the problems and obstacles concerning all categories of people with disability.
- To provide suggestions to the University’s authorities for the improvement of accessibility level based on actual facts.

Three teams were created, each one consisting of two students, and they received appropriate training concerning the application of the checklists. Two researchers supervised the students’ work, in collaboration also with the Accessibility Office for People with Disability of the Aristotle University of Thessaloniki. Data were collected in the field, using appropriate means (digital camera, measuring tape, slope meter etc.). Following, the data were used to prepare a relevant report.

1. Open spaces

The observations along the route were divided in the following categories:

- bridging different levels,
• ramps,
• surface of footways,
• obstacles,
• signing, etc.
In total, more than 4 km. of footways were examined inside the campus of the Aristotle University of Thessaloniki and the following problems were identified:
• 40 permanent obstacles
• 69 temporary obstacles
• 20 signing issues
• 17 ramps
• 28 different height levels
• 22 bad surface maintenance level

1.1 Ramps

A major problem at the Aristotle University of Thessaloniki campus is that many ramps at the sidewalks are occupied by illegally parked vehicles. This has led to the installation of obstacles that in some cases create more problems to the unhindered movement of people with restricted mobility. Most of the ramps are old and are not constructed according to the latest design guidelines. Furthermore, some height differences are not bridged by ramps at all.

1.2 Movement corridors

Footway is used as parking space in a significant part of the University's campus. A footway is available in parallel with the pavements where the cars park. However, this is not easily visible, thus confusing pedestrians. Furthermore, this footway is much narrower than the one reserved for parking vehicles. Tactile surface indicators are installed in some parts of the footway.

1.3 Obstacles

The most common temporary obstacles found are cars parked on the pavement. At several places movement on the pavement is impossible for people with restricted mobility. Other elements, such as erroneously placed garbage bins, flower-stands, extensive use of street furniture etc. also constitute obstacles.

1.4 Signage

At many routes a Tactile Ground Surface Indicator (TGSI) has been placed in the recent years according to the guidelines of the Hellenic Ministry of Environment, Land Planning and Public Works. Actually, both the slightly different types suggested by the Ministry through the years have been installed at the campus. Poor workmanship at certain points and some obstacles next to the TGSI, constitute hazards for people with restricted vision.

In general, signing is not sufficient. As the campus covers a large area and includes many facilities, clear information is required to help the orientation of visitors.
of the signs are not placed appropriately, creating obstacles while other signs have become an object of vandalism. [Tsalis et al., 2009; Ismail Oglou et al., 2010]

2. Evaluation of buildings

In total, 26 buildings were assessed comprising:

- 94 entrances,
- 35 external ramps,
- 13 internal ramps,
- 47 elevators, of which 7 were suitable for use by people with disability,
- 65 staircases,
- 150 toilets,
- 11 toilets for use by people with disability, and
- 9 platform lifts.

2.1 Parking spaces

14 parking spaces are designated for use by people with disability. In some cases, where there are two or more designated spaces, an embarkation area 1.5m wide was created between them. There is clear signage with yellow markings, a sign depicting the International Symbol of Accessibility, and, in certain cases, the whole parking space painted blue.

2.2 Approaching the buildings

In some cases, the route from the parking spaces to the buildings’ entrance is too long (>35m), while various obstacles were observed on the approach route of some buildings. There are no tactile surface indicators installed to help people with sight problems. At some buildings, the height differences between the approach route and the building’s main entrance are covered only by stairs. Poor workmanship and obstacles can be observed at various routes.

2.3 Ramps

The main problem identified was that some of the ramps have slopes that are not built according to Greek national guidelines, making them difficult to be used autonomously by a wheelchair user. There is a lack of proper equipment concerning handrails, tactile signage etc.

2.4 Entrances

Most of the main doors of the buildings assessed have aluminum frames with glass panels. In general, double doors have 1.8m to 3.0m width, while single door leaves are between 0.8m and 1.4m wide. In most cases, there is no color contrast between the doors and their surroundings, thus their identification is difficult for people with sight problems. There are various kinds of doorknobs used, not all of them easy to use for people with restricted arm movement. Automatic doors are rather scarce.

2.5 Horizontal movement
All buildings assessed have a large hall after the main entrance where an information desk (not always accessible) can be found. From the entrance hall there is access to elevators / platform lifts or staircases. Various permanent and temporary obstacles can be found, including plants, fire extinguishers, benches etc., which may become dangerous to people with sight problems.

2.6 Vertical movement.

Accessible elevators can only be found at three of the assessed buildings. As accessible were identified elevators that have automatic doors, dimensions larger than 1.10m. * 1.40m., buttons in Braille, handlebars and audible announcement of floors. In general, there is a lack of proper signage and color contrast between the elevators and their surroundings. Stair-lifts are only implemented at staircases where there is a free width of 1m. even when the lift is in use. However, in general, it’s not always easy to contact the person responsible for operating the lift and, due to their characteristics, these are not frequently used.

2.7 Services

Only 11 accessible toilets have been identified at the University, while there are 150 toilets available to the general public. Some of the designated toilets do not meet the accessibility criteria. There is an information desk at all the assessed buildings, not always accessible.

2.8 Signage

In general, the buildings’ signage is inadequate and does not help orientation. Signs exist mainly at the halls’ entrances to clarify their use. The signs used do not have the same format, and many of them suffer from reflections. There are some guiding signs, but no orientation maps are available. No Braille signage is available.

2.9 Emergency cases

At all buildings there are fire safety studies which include plans for evacuation in case of an emergency. However, these plans do not take into account the needs of people with disability and many emergency exits of the buildings are not accessible. There are audible and visual alarms available though.

2.10 Acoustics, illumination

Acoustics are satisfactory at all the buildings. The level of noise obviously depends on the number of students present. Illumination is considered adequate. [Tsalis et al., 2009; Ismail Oglou et al., 2010]

3. Educational process

In general, AUTh lacks provisions in the educational process that would facilitate students with disabilities. Classrooms lack assistive technology and books are not always available in alternative formats. Only one sign language interpreter is available for the whole campus who cannot meet the needs of all students. A
keyboard with refreshable Braille display for the use of PC by a vision impaired person is available in the central library. [Tsalis et al., 2009; Ismail Oglou et al., 2010]

DISCUSSION AND USE OF RESULTS

No particular problems were noted in the implementation of the methodology by the researchers. The methodology developed can provide a tool that could be applied to Universities at a wider level. Consistent accessibility policy, creation of accessible infrastructure and the close cooperation among the University’s community authorities (the Accessibility Office, the University’s Social Committee and student’s organizations) can lead to an holistic approach on improving accessibility.

The evaluation’s results were disseminated to the Accessibility Office for People with Disability of the Aristotle University of Thessaloniki and the Social Committee in order to pinpoint actions for the improvement of the University’s accessibility. The Accessibility Office for People with Disability of AUTh has already used these results in various accessibility improvements, such as the construction of 12 accessible toilets and the planning of 15 more, the planning of constructions about the horizontal and the vertical accessibility and the accessibility of open public spaces.

CONCLUSIONS

The methodology developed, through its successful implementation in AUTh, proved its validity and aspires to provide a tool that could be applied to Universities at a wider level. The following problems were identified in AUTh:

- The large number of buildings of the campus of the Aristotle University of Thessaloniki makes the creation of a network of completely accessible facilities quite a difficult challenge.
- There are many deficiencies at the buildings, mostly at the older ones.
- In general, there is a lack of proper signage and many maintenance issues.
- There is a severe lack of infrastructure regarding the free movement of people with disability.
- The extensive illegal parking of vehicles hinders pedestrian movement.
- Actions that have taken place, rather recently, for the improvement of accessibility (introduction of TGSIs, creation of accessible parking spaces, exemplary accessibility infrastructure) have significant results.

Figure 1: Good practice examples at AUTh University campus
The following main suggestions were made to the University’s authorities in order to improve the accessibility level offered:
- The facilitation of the Accessibility Office for People with Disability with the provision of the necessary personnel and resources as well as the creation of an accessibility policy would be fundamental in improving AUTh’s accessibility.
- A basic network of accessible routes connecting all the facilities should be created the soonest possible and next this should be further expanded.
- At least two accessible elevators and toilets should be created at all the buildings.
- Signage should be improved, including maps, tactile signage, signs with pictograms, use of Braille, where appropriate, etc. Illumination and colour contrast should be also improved.
- An emergency evacuation plan should be created focused on the needs of people with disability.
- Prohibition of parking and imposing of penalties such as the removal of entry permission in case of illegal parking.
- Regular maintenance and checking of existing infrastructure should be implemented.
- Removal of obstacles, examination of street furniture and replacement, where necessary with more appropriate one
- Assistive technology, material presented in alternative forms, sign language interpreters, accessible cultural halls etc. should be available to students in order to ensure their equal participation in the educational process and the social activities

As a result of the above, the following are currently under implementation:
- The new Rectorate considers all the above and has established two sub-committees within the Social Committee, one dealing with the accessibility of the physical environment and one dealing with the accessibility of the educational procedure.
- Furthermore, a Rectorate decision has been made that at least 3% of the annual budget of the Public Investments Programme for AUTh will be allocated each year for accessibility improvement interventions, until the Campus becomes accessible.
- After that decision, a coherent accessibility strategy is followed that gradually addresses four main accessibility problems:
  - The construction of at least one accessible toilet per building.
  - Horizontal accessibility: mainly through the construction of ramps
  - Vertical accessibility: through the construction of accessible elevators.
  - Open public spaces: where the proposal of the Accessibility Office is the transformation of the whole Campus to a “woonerf” zone.
Currently, the first phase of this strategic approach is about to be achieved.
- High priority is placed on the creation of accessible toilets, particularly at schools where there is at least one wheelchair user student.
- A special transport service has been established. This services 21 students with restricted mobility, 11 of which are wheelchair users. The service uses 2 accessible buses and operates Monday to Sunday between 07:30 and 23:00.
- A society of voluntary students to assist students with disabilities has been established.
• The University authorities consider to establish a special “task force” of professors and external specialists to undertake together with the Accessibility Office the work of preparation of studies and application of works and systems for a real promotion of accessibility in the University. As they state, sustainable environmental planning and accessibility for all are the main pillars of their policy.

All the above, show that the first serious step towards an accessible university should be the identification of the accessibility problems and obstacles through a scientific approach similar to the one presented above. This first crucial step has as a result both the rise of awareness about the problem and also a first guide on what the following steps should be.

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