



## **Project UNIALL: Accessibility of Higher Education for Students with Special Needs**

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### **Output 05: Case studies of Inclusive Higher Education in Europe**

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## **1. OUTPUT TASKS AND STRUCTURE**

The development of this Output 05 of the UNIALL Research was based on the idea that accessibility to Higher Studies for students with Special Needs is divided into several aspects, related to the physical environment, support services, information and communication systems, study materials. These are hardly all fully and thoroughly interpreted in European universities: more frequent is the case in which universities focus their efforts towards accessibility according to a hypothetical hierarchy between the aforementioned aspects, in relation to their own contexts and their own dimensions and organizational structures.

Therefore, the main task of this Output 05, whose activities were led from the working group of the University “G. d’Annunzio” of Chieti-Pescara, was to highlight good practices and success stories of inclusive higher education from Europe, describing innovative effective solutions at least in one or more “types” or better “aspects” of accessibility issues for each selected University.

In particular, in the first chapter of this report, are better described: the Output objective (that is which data were collected and why), the way how Universities and good accessible solutions were selected (that is the selection criteria of Universities/good solutions and the definition of data collection techniques), and finally the preparation for data collection (that is the definition of data collection forms).

### **1.1 Output objective**

The purpose of this output was to gather information about “accessibility” in European Universities and Schools for Higher education.

In fact, in its previous steps, the UNIALL research have already shown that access to Higher Education for students with special needs can be divided into several aspects related to the physical environment, to support services, to information and communication systems, to study materials. It has also emerged that different Universities put in practice these aspects in different ways (and with different results), in relation to their own contexts and their dimensions and organizational structures. So it has been possible to say, only hindsight, that for each of these aspects the best solutions in each country are represented by different universities.

Actually, in the previous steps of the Research, only the situations in the research Partners’ Countries (Slovak, Czech Republic and Italy) were analysed.

The present step intended to extend the field of investigation from the national borders of the three partners to a European dimension.

Through the selection of a limited number of Universities from different European countries, in fact, the Research tried to take stock of what is the level achieved in Europe related to the analysed issues.

In particular, this step limited to gather information, without any particular processing purpose other than to offer a first and quick look at some solutions that, thanks also to the different national legislative contexts, favor an inclusive accessibility to higher education.

In particular, this output was focused on data collection and description of:

- good practices of designing inclusive environment at selected universities,
- the systemic configuration for inclusion in the legislative environment,
- the processes of implementation of inclusive measures at universities in different European countries.

## **1.2 Case selection and determination of data collection techniques**

In the extension of the investigation to the European scale actually it seemed even more difficult to identify *a priori* what are the design best solutions of inclusive environments in an absolute sense.

The hypothesis was therefore to select some universities in Europe where it is plausible that the good examples of inclusive study environments could have been developed (on the basis of the political-legislative and socio-cultural context of the Countries and on the basis of the reputation of the single universities), in order to finally try to compare their features.

Each selected university has therefore been described through their general characteristics, as well as there has been an in-depth analysis of information (description, images, figures, etc.) relating only to one single issue (environment, services, information, Study materials) in which their representatives feel by themselves that they have developed the concept of accessibility in a more inclusive and successful way.

At the same time, brief information on the national strategies, as well as on the legislative structures (and their implementation processes) and on any possible national organizational structures have been collected directly from the representatives of selected universities. This in order to find possible relationships

between the described inclusive solutions and the favourable socio-political conditions in which such solutions have been made possible.

Based on the hypothesis, nine Universities/Higher Schools were selected on the base of the following selection criteria:

- n. 3 in the countries directly involved in the UNIALL Research:
  - 1 case in Slovakia (Slovak University of Technology in Bratislava)
  - 1 case in the Czech Republic (Palacky University Olomouc)
  - 1 case in Italy (Polytechnic University of Bari)
- n. 6 in other European countries, in particular divided into:
  - 2 cases in Scandinavian countries:
    - 1 in Sweden (Mid Sweden University)
    - 1 in Norway (NTNU\_ Norwegian University of Science and Technology)
  - 4 cases in other European countries:
    - 1 in Belgium (Hasselt University)
    - 1 in France (ESADSE\_Ecole Supérieure d'Art et Design Saint-Etienne)
    - 1 in Germany (KIT\_Karlsruhe University of Technology)
    - 1 in Greek (NKUA\_National and Kapodistrian University of Athens)

### **1.3 Preparation for data collection (definition of data collection forms)**

At this point the question was related to which information had to be collected and in which way to collect them (in order to have comparable data).

As far as data collection was concerned, it has been articulated in two successive steps , A and B:

**step A\_** Each University's contact person would have been asked to fill in a form (**Annex No.1**) in which, in addition to some quantitative data relating to his University, a brief description of the following types of information was also required:

**1. Accessibility of physical environment** (overall accessibility of outdoor and indoor environment for teaching and socialization, of furniture, of signage and way-finding system, of emergency evacuation, etc.)

**2. Accessibility and availability of the support services for students with SEN\_Special Education Needs** (counselling services, diagnostic centre, study support, assistance, sign language interpreting, etc.),



**3. Information and communication accessibility** (ICT systems, assistive technology, university web-pages, and AIS – academic information system),

**4. Accessibility of study materials** for students with sensorial impairments and students with specific learning disorders,

**5. Methods and tools for monitoring accessibility** (committees and assessment structures, tests and check-lists, etc.)

**6. Training activities on accessibility issues** (staff training or compulsory didactic activities included in the student's study plans related to "design for inclusion" - Universal Design, Inclusive Design, Design for All)

For each of these types of information, each University also briefly would have been asked to describe the relationships with their respective national legislative structures and the implementation processes/measures that have made it possible (this just listing the main reference laws and shortly describing, in a "captivating" manner, their contents and any specific elements of innovation).

**Step B\_** Afterwards, each University, through its contact person, would have been asked to deepen the description of at least one of the six types of accessibility issues that it felt to have been developed more than others and that could also be considered as a "good practice" on its national overview. This supplementary worksheet (**Annex No.2**) consisted of a more detailed descriptive text, referring to the main solutions adopted, accompanied by images (photos, figures, etc.).

For this reasons, two different Annexes were developed (see attached appendixes), with a specific structure for data collecting, as reported in the appendix to this document.

With reference to the data collection, it was decided to ask the representatives of each University to fill in the two Annexes without any particular indication for the structure of their descriptions (except with a general indication of the length of the texts to be inserted), to allow each to freely articulate the descriptive issues and their contents.

The result is an overall vision that, if not due to particularly effective criteria from the point of view of a possible and strictly comparative analysis, still is able to offer a sufficiently comprehensive picture of the good solutions adopted in reference to the different declinations of "accessibility" to higher studies.

## 2. COLLECTED DATA

The nine Universities chosen to be analyzed through the solutions they have adopted to facilitate access to higher education for students with special needs, have returned an interesting picture of opportunities to make higher studies more accessible. This both in reference to the different types of accessibility identified by the UNIALL research, and in reference to the individual solutions adopted, which in several cases are particularly innovative.

In particular, the nine universities have oriented the description of their accessibility solutions (that they considered by themselves to be more interesting) according to the following table:

		1. Accessibility of physical environment	2. Accessibility and availability of the support services for students with SEN <i>Special Education Needs</i>	3. Information and communication accessibility	4. Accessibility of study materials	5. Methods and tools for monitoring accessibility	6. Training activities on accessibility issues
Belgium	Hasselt University						
Czech Republic	Palacky University Olomouc						
France	ESADSE_Ecole Supérieure d'Art et Design Saint-Etienne						
Germany	KIT_Karlsruhe University of Technology						
Greek	NKUA_National and Kapodistrian University of Athens						
Italy	Polytechnic University of Bari						
Norway	NTNU_Norwegian University of Science and Technology						
Slovakia	Slovak University of Technology in Bratislava						
Sweden	Mid Sweden University						



In the following pages, in reference to the nine universities analyzed (listed in alphabetical order of their countries) are reported the contents collected through the two annexes, as they were freely filled by the contact persons of the universities, whose descriptions are sometimes also significantly variable in terms of length and details.

In particular, the contents are reported starting from the contents of the Annex 2 ("Good design practices for environments and services"), as it contains the description of the accessibility solution that everyone considered particularly interesting among those developed in recent years in their academic context. These contents are followed by those of Annex 1 ("Synthetic framework for accessibility of university environments and services"), which offers a description of the analyzed University, of the set of their activated accessibility solutions and, for each of them, a fragment of the national legislative framework that made their activation and development possible.



## 2.1 Hasselt University (Hasselt, Belgium)

### 2.1.1. Description of a good accessibility solution:

**Title:** *UD Living Lab*

**Category of accessibility:** training activities on accessibility issues.

Together with the partners PXL University College and Inter (expertise center on accessibility and Universal Design), UHasselt redesigned and rebuilt a typical 3-floor townhouse in the center of the city into a UD Living Lab ([www.woonlabo.be](http://www.woonlabo.be), also see Herssens, Nijs & Froyen, 2014). The UD Living Lab (485 m<sup>2</sup>) is an interactive demonstration house (264 m<sup>2</sup>), visitor center (156 m<sup>2</sup>) and research facility (including an open space laboratory of 65 m<sup>2</sup>) to showcase product applications and (interior) architectural solutions according to the principles of Universal Design. Researchers, experts, students, designers, constructors and users were all involved in the design process and several design elements were also designed on the site and at scale 1:1.

The UD Living Lab is open to the public and for professionals, but we also use the UD Living Lab to train and educate students (including phd students) and make them aware of both the importance of UD and how UD can actually be implemented. The specific type of didactic activities depend on the type (bachelor, master) and number of students and the specific course in which the activities are framed (e.g., design studio or research assignment for human sciences course). Some typical activities include:

- Guided visits through the lab to show and explain different UD solutions
- Simulation exercises in which students use tools to simulate certain disabilities (e.g., aging suit, glasses to mimic visual impairments, wheelchairs,...) and can interact with the environment to experience the possibilities (and difficulties) of the products and (interior) architectural elements that are present.
- Workshops with expert-users in the lab. For example, organising a cooking workshop with a team of expert-users (such as a blind person and a person with one hand) to investigate in depth on how to make the kitchen more accessible and useable and to sensitize our students to these issues (see Herssens & Spooren, 2015). This can also be coupled to an actual design assignment (co-creation). A recent example includes the design of a Universal Design drinking glass by students from the second bachelor year following a cooking workshop



with expert users, for which the students received a Cera Award for social innovation.

### **Why the solution can be considered innovative**

In order to achieve a more inclusive built environment, we believe it is essential for future spatial designers (architects and interior architects) to be familiar with the concepts of accessibility and Universal Design. In addition to introducing our students to these ideas in a conceptual, theoretical way, we make use of the Universal Design Living Lab, an interactive demonstration house designed according to the principles of UD, to not only show them a good example in real-life but also to have them really experience the advantages of such an environment themselves. Moreover, as a research facility the, UD Living Lab also provides our students the possibility to work together with other disciplines (e.g., physical therapists) and with user-experts to investigate aspects of Universal Design in more detail. As such, our students can acquire a much deeper and more intimate knowledge on the important issue of Universal Design.



## 2.1.2. Accessibility framework at Hasselt University

### Short description of the University and its locations

Hasselt University is a young university that has achieved enormous growth in the past four decades.

1973: The Limburg University Centre (LUC for short) – the predecessor of Hasselt University - officially opens to students in Diepenbeek, two years after the legal authorisation of the creation of an autonomous university institution in Limburg. LUC starts with six programmes: mathematics, physics, chemistry, biology, dentistry and medicine.

1991: Limburg Economic University College is integrated into LUC and becomes the Faculty of Economic Science (now the Faculty of Business Economics).

2002: LUC and Maastricht University jointly establish the Transnational University of Limburg (tUL) – an internationally unique partnership of two universities in two countries. The computer science, statistics and biomedical sciences programmes are organised under the tUL umbrella.

2003: LUC and the Limburg university colleges PHL and XIOS (which have since merged to form PXL University College) together form the Limburg University and Colleges Association (AUHL).

2004: The Bachelor's and Master's programmes in transportation sciences – the only ones of their kind in Flanders – are added to the curriculum.

2005: The Limburg University Centre is renamed Hasselt University, or UHasselt for short.

2008/2011: Hasselt University launches its Bachelor of Law degree, a collaboration with Maastricht University and KU Leuven. Three years later, a Master's programme in law follows.

2012: Hasselt University opens a second campus: the 'urban campus' in the centre of Hasselt. Hasselt Campus includes the Rectorate Building, the Law Faculty building and – right at the centre – the Oude Gevangenis (Old Prison). This is the place where law students attend classes and where new students must register.

2013: Four new programmes are introduced in Hasselt University in the academic year 2013-2014: architecture, interior architecture, engineering technology, rehabilitation sciences and physiotherapy.



At the same time, two new faculties are established: Faculty of Architecture and Art, Faculty of Engineering Technology. This increases the number of faculties from four (Business Economics, Medicine and Life Sciences, Law and Sciences) to six.

2014: Hasselt University establishes the School for Transportation Sciences and the Hasselt University School for Expert Education (UHasselt SEE).

2015: The Faculty of Business Economics launches the business administration programme.

Total students 6395

Total employees: 1296

Total students with: (2016\_2017): 420

Developmental disability: 348

- learning disability: 226
- ASS (autism spectrum disorder): 40,
- ADHD (attention deficit disorder): 79
- other: 3

Physical (including sensorial): 15

Chronic disease: 27

Psychiatric disease: 27

Multiple: 3

- Possible institutional documents related to accessibility:

Internal document (only in Dutch) (61 pages) named:

“Students in special circumstances. Guide in granting reasonable accommodations at education and exams”. Contents: Introduction, background, reasonable accommodations, procedures, target group, attestation, guidance, privacy and discretion, complaints and appeals.

- Most of information listed in this document can be get at the website page:

<http://www.uhasselt.be/UH/Special-facilities-for-students-in-special-circumstances/Functional-impairment-learning-disability.html>

**Short description of the main design solutions related to environments and services to facilitate the study to students with special needs**



### **a. Accessibility of physical environment**

**National legislative framework** (main laws and implementation processes):

Since the 1 March 2010, a new legislation on the accessibility of public buildings has been introduced in Flanders. From this moment on, accessibility has become a required element to be evaluated when applying for a planning permission. (<http://toegankelijkgebouw.be/Eng/tabid/371/Default.aspx>). As a Flemish organisation we are under these law.

**Main solutions adopted at Hasselt University:**

All the requirements of the law have been applied.

### **b. Accessibility and availability of the support services for students with SEN\_ *Special Education Needs***

**National legislative framework** (main laws and implementation processes):

Each institution of higher education in Flanders has the same framework but determines its organization. All students are entitled to equal educational opportunities. This is statutory in the following laws, decrees and treaties:

- Anti discrimination law (10-05-2007)
- Flanders equal opportunity law (10-07-2008)
- UN convention entitles people with disabilities (2-07-2009)
- Codex higher education article II 221 (11-10-2013)

New support model and funding article III 67 codex higher education (modified by Flemish law XXVII 8-06-2017) articles II 117 to 119, II 276 §3 and article III 67.

- Education, Examination and Legal position regulations Hasselt University 2017-18

**Main solutions adopted at Hasselt University:**

The UHasselt wants as much as possible an inclusive education system (Policy Diversity in Inclusive Education AUHL 2014-2019): The aim is to design and organize education in such a way that it is accessible to all students. In spite of the aspiration for inclusion, however, reasonable facilities remain in certain situations: where students with disabilities are experiencing thresholds that prevent them from participating in the education and exams in full and on equal terms.

The support service for students with special needs is integrated in the student coach office. There is one contact person (the care coordinator) responsible for the diagnostic and organising/coordinating facilities for students with disabilities (in cooperation with the other study coaches, student facilities (logistic) office, study career office, psychological assistance, and others... ).

A student who wishes to apply for additional support in the form of facilities for education and evaluations, can apply at any moment during the academic year (or before the academic year has started) and during his entire study. The application process is the following:

- In their electronic student file, students can find an application form they have to fill out, sign and deliver to the care coordinator. They also gather the necessary documents /certificates.
- The care coordinator will invite the student for a **meeting**. During this meeting an evaluation is made of the difficulties or problems the student is experiencing or expect to experience in attending classes and / or during exams, and of what type of coaching and facilities could help him with these problems.

Minimum facilities are facilities where all students with the same restriction within the UHasselt can appeal to and are not submitted to the Examination Board. This is the case, for example, for students with a learning disorder.

- The application and the proposal for extra facilities are - if necessary - submitted to the **Examination Board** of the relevant programme. The Examination Board determines whether the requested facilities are possible within the programme (taking into account the learning outcomes, subject related or practical feasibility and other factors) and decides on whether or not to grant these facilities.
- If the functional impairment is permanent, the student can make use of the facilities throughout his entire study career at Hasselt University on the basis of the submitted certificate(s). If the functional impairment is long-term, but not permanent, the student will need to apply for facilities annually in order to renew them; the certification will then need to be renewed annually.

The study career coach follows up on the **practical organisation of the facilities** (e.g. extending the length of an exam).

### **c. Information and communication accessibility**

**National legislative framework** (main laws and implementation processes):

See above under b.

**Main solutions adopted at Hasselt University:**

Information about accessibility and facilities to realise inclusive education is available on the website; public part and intranet.



Future students can already ask to receive additional information about studies with a disability at the UHasselt. During course days, information sessions and in brochures, students are informed that they can request facilities. Most of the students at UHasselt have facilities for a developmental disorder (dyslexia, ADHD, ASS), for this group most measures are worked out (The UHasselt currently has, for example, no blind / deaf students). For the other groups, tailor-made, ad hoc solutions are being worked out. For example:

Dyslexia: ability to use read-only software

ASS: Intensive study counseling, buddy system (fellow student as contact point for student with ASS).

#### **d. Accessibility of study materials for students with sensorial impairments and students with specific learning disorders**

**National legislative framework** (main laws and implementation processes):

See above under b.

In particular, we have the Flemish Contract: "Declaration of commitment for writing interpreters in education".

**Main solutions adopted at Hasselt University:**

A lot of study material is already offered digitally through the Blackboard learning environment. Students with dyslexia can also always request extra digital course material.

Students with dyslexia can use supportive software (Kurzweil, Sprint). Subject to permission, students may also record lectures.

#### **e. Methods and tools for monitoring accessibility**

**National legislative framework** (main laws and implementation processes):

See above under a and b.

In particular, in the Flemish region we have three different "councils":

- VLOR: Flemish Education Council
- VLIR: Flemish Interuniversity Council
- VHORA: Flemish Council University Colleges

Based on these organization, there are:

- VLOR manuel registration in higher education (2008)
- VLIR-VLHORA Charter registration students with special needs in Higher Education (2017).



**Main solutions adopted at Hasselt University:**

Regarding registration and monitoring, Hasselt University was an early adopter.

Since 2006 students with special needs are registered, and since 2008 all the Flemish guidelines (VLOR, VLIR-VLHORA) are strictly followed.

Moreover, according to buildings accessibility monitoring, In case of new buildings, UHasselt will follow its own design team. They have the expertise either at home or outside.

**f. Training activities on accessibility issues**

**National legislative framework** (main laws and implementation processes):

No specific legislation.

**Main solutions adopted at Hasselt University:**

-Different staff members are active in the network and expertise center for inclusive higher education (SIHO): <http://www.siho.be/about-us>

-In the educational professionalization Hasselt University places emphasis on the topic of inclusive education. Each academic year there is at least one module on this theme.

-The Faculty of Architecture and Arts has a lot of expertise on accessibility and UD and this is valorised in internal and external work- and steering groups and projects.



## 2.2 Palacky University (Olomuc, Czech Republic)

### 2.2.1. Description of a good accessibility solution:

**Title:** *Mapping accessibility of premises at Palacky University*

**Category of accessibility:** accessibility of physical environment.

The mapping is based on the aforesaid Methodology for Categorizing Accessibility of Buildings. Based on the accessibility, the methodology divides buildings into these categorized:

- A) accessible,
- B) partially accessible,
- C) non-accessible or accessible with difficulties.

Each of these categories has its **limits**, which are used to further categorized mapped premises into three groups based on their accessibility. The limits are derived from user experience, abilities of persons with various types of disability, technical standards of wheelchairs, and various compensation tools.

The categorization marks the overall accessibility of premises.

The decisive part of different types of buildings is the part which is in direct relation to its function. (The example might be a swimming pool, where not only the pool itself needs to be accessible, but also the cabins and surrounding facilities. However, the accessibility of tribune does not have to be the decisive factor for the overall evaluation of the building. The information on accessibility of related functions need to be part of the description.)

Information are processed in the form of structured text description of a building. All key data is written in the text. Based on the detailed information and the knowledge of his or her abilities each client can decide whether he or she is able to visit a particular building, or what aids or help will he or she need when visiting such buildings.

The methodology only serves to process information on the current accessibility status of premises. Adherence to a valid Ministry of Regional Development Decree no. 398/2009 Coll., on the general technical requirements ensuring barrier-free use of buildings is required when formulating proposals to adjust or remove identified architectonic barriers.



### **Accessible building Limits:**

- The whole or most of the building is accessible with at least one accessible entrance. Visits are possible without the need of appointments in advance.
- Ramps and rails (mobile or fixed) placed outside at the entrance or inside of the building have a maximum slope of 12.5% grade when their length 3m or less, 8% grade when their length is 9m or less. The width of fixed ramps is at least 110 cm.
- Doors and passages are at least 80 cm wide. This applies to the main part of double doors. The doorstep are no more than 2 cm in height.
- Self-operated lift is available to overcome height differences. The dimension of the lift are: door width 80cm, inner-cabin measurements: width 100cm x depth 125 cm. Premises with platforms are not evaluated as accessible.
- The building must have an accessible bathroom (WC type I.) if the premises have public bathrooms. Alternatively, if all the other requirements of accessibility are met, building must have one partially accessible bathroom (WC type II.). Surfaces and slopes of floors inside the building and in its immediate vicinities do not significantly complicate the movement on wheelchair.
- Additional information on individual aspects of accessibility are available in the supplementary text.

### **Partially accessible building Limits:**

- Only a part of building is accessible or the building does not meet the requirements of an accessible building.
- The description of unmet requirements is stated in the text.
- Ramps and rails (mobile or fixed) placed outside at the entrance or inside of the building have a maximum slope of 16.5% grade when their length 3m or less, 12.5% grade when their length is 9m or less. The width of fixed ramps is at least 110 cm.
- Doors and passages are at least 70 cm wide. The doorstep are no more than 7 cm in height.
- The minimum lift dimensions are: door width 70 cm, inner-cabin measurements: width 100 cm x depth 110 cm.



- The minimum platform measurements: door width 70 cm, transport area: width 70 cm x depth 90 cm. The load capacity information are available in the supplementary text.
- Bathroom accessibility is not a decisive factor. Due to current (non-)accessibility of premises in the Czech Republic, the requirement of accessible bathroom (WC type II.) in buildings with partial accessibility would result in reclassification of majority of these buildings into non-accessible category.
- There is a maximum of one step at the entrance to the building which is not in any way adjusted to the needs of mobility impaired students.

**Non-accessible building or Building accessible with difficulties Limits:**

- The access or movement in the premises is especially complicated (due to a combination of various reasons).
- Additional information on individual aspects of accessibility are available in the supplementary text.

**Source:** Methodology for Categorizing Accessibility of Buildings, POV, 2014

(<http://www.pov.cz/publikace/metodika-kategorizace-pristupnosti-objektu>)

**Why the solution can be considered innovative**

The selected area was chosen because of its current importance at Palacky University in Olomouc - it is mainly because the number of students with mobility impairment is constantly increasing on a number of UP faculties.

In 2016, CSSSN employees were trained by Prague wheelchair organization in Methodology for Categorizing Accessibility of Buildings.

The methodology is a result of cooperation of specialists in architectonic barriers from organizations and institution from around the Czech Republic. The reason behind this methodology is the fact that evaluation of building accessibility in accordance to current laws would mark most of the buildings as non-accessible, or "sort-of" accessible.



## 2.2.2. Accessibility framework at the Palacky University

### Short description of the University and its locations

Palacký University Olomouc is a university with a long-standing tradition. Founded in the 16th century, it is the oldest university in Moravia and the second-oldest university in the Czech Republic. Nowadays, it is a modern higher education facility with a wide range of study programmes and copious scientific and research activities. The eight faculties of Palacký University offer 332 Bachelor's, Master's, and Doctoral study programmes. Applicants may choose from a broad variety of programmes, ranging from theology, education, physical culture, sports, through the humanities, social sciences and arts, to natural, medical, and health sciences. The credit system at UP is fully compatible with ECTS – The European Credit Transfer and Accumulation System.

#### Statistical Data

- 20,928 students in accredited study programmes
- 332 accredited study programmes of various forms
- 84 accredited study programmes in various forms taught in foreign languages
- 27,338 applications for studies
- 4840 beds in UP dormitories
- 417,641 meals served to students in 2016
- 108,895 meals served to employees in 2016

- Total employees: 1 827 academic employees and 446 researchers
- Students with disabilities:

Categories of Disability	Students with Disability
Student with visual impairment – sight user	14
Student with visual impairment – user of touch/voice	6
Student with hearing loss – spoken language user	24
Student with hearing loss – sign language user	13
Impairment of lower limbs (paraplegia)	3
Impairment of upper limbs (fine motor skills)	21
impairment of lower and upper limbs	10
Specific learning disorder	94
Autism spectrum disorder	10
Disturbed communication ability	6
Other difficulties	31
<b>In total</b>	<b>232</b>

The following norms determine the status of students with special needs:

- Palacky University Study and Examination Regulation
- Palacky University Rector’s Directive on Applicants and Students with Special needs - the idea behind this directive is not to promote “positive discrimination” of the applicants and students with special needs but to eliminate any obstacles arising from medical conditions which might prevent applicants and students with special needs to take the entrance exams or study without restrictions. This directive adjusts the conditions of entrance exams for applicants with special needs and of study environment for students with special needs at Palacky University in Olomouc. According to this directive, applicants or students with special needs are those whose special needs arise from medical disabilities, specific learning disabilities, and chronic somatic or mental illnesses. Sensory, physical, and mental disabilities are considered to be disabilities if they last or are to last, in accordance to medical knowledge, at least for a year. The support for applicants and students with special needs is administered by a UP established Centre for Support of Students with Special Needs. The support is highly individualised based on the needs and disabilities of individual students.



- Statute of Centre for Support of Students with Special Needs

All regulations are accessible on UP website:

<https://www.upol.cz/pl/zamestnanci/predpisy/normy-a-vnitri-predpisy/>

<http://cps.upol.cz/sluzby/legislativa/>

## **Short description of the main design solutions related to environments and services to facilitate the study to students with special needs**

### **a. Accessibility of physical environment**

**National legislative framework** (main laws and implementation processes):

- Decree no. 398/2009 Coll., on the general technical requirements ensuring barrier-free use of buildings.
- Ministerial Regulation no. 268/2009 Sb., on the technical requirements of buildings
- ČSN EN 81-70 (27 4003) – Safety rules for the construction and installations of lifts
- ČSN ISO 9386-1 (27 4013) – Power-operated lifting platforms for person with impaired mobility - Rules for safety, dimensions and functional operation
  - Part 1: Vertical lifting platform
- ČSN ISO 9386-2 (27 4013) – Power-operated lifting platforms for person with impaired mobility – Rules for safety, dimensions and functional operation - Part 2: Powered stairlifts for seated, standing and wheelchair users moving in an inclined plane

#### **Main solutions adopted at Palacky University:**

The accessibility of UP premises varies mainly because some faculties are stationed in historical buildings. As a result, some premises are wheelchair accessible, while others are only partially accessible or not at all. The new buildings of Faculty of Science, Faculty of Physical Culture, Faculty of Law, and Sts Cyril and Methodius Faculty of Theology are fully accessible, while the new building of Faculty of Pedagogy is only partially accessible. Faculty of Medicine, Faculty of Arts, and Faculty of Health Sciences buildings are partially accessible as well. A number of premises are considered problematic in terms of accessibility, these include Computer Centre, University Library, Centre for Lifelong Studies, and premises where basic administrative acts are carried out (student and employee registration cards issuance).



The long-term vision is to make all university premises wheelchair accessible. Modifications and construction of bathrooms, doors, entrances, lifts, platforms, and ramps are already on the way in a number of buildings.

UP uses the aforesaid documents for mapping its premises. Methodology for Categorizing Accessibility of Buildings is used for the mapping. (Accessible at: <http://www.presbariery.cz/cz/ke-stazeni/category/6-publikace>).

The mapping priority was given to buildings with higher number of students with limited mobility.

## **b. Accessibility and availability of the support services for students with SEN\_ *Special Education Needs***

**National legislative framework** (main laws and implementation processes):

- Act No. 111/1998 Coll., on universities and amending other acts [link]
- Rules for providing support to public universities by the Ministry of Education, Youth and Sports, Appendix No. 3 Financing increased costs connected with the education of students with special needs. (This is a methodological guide, which is amended every year)

**Main solutions adopted at Palacky University:**

Palacky University in Olomouc has established a specialized university facility - Centre for Support of Students with Special Needs (hereinafter CSSSN) - which is a standalone unit within the UP Rectorate with its own statute (B1-12/2-HN), institutional rules, and rector's directive (B3-14/4-SR), which adjusts conditions of studies for applicants and students with special needs at Palacky University in Olomouc from the initiation of the admission process throughout the duration of their studies.

## **c. Information and communication accessibility**

**National legislative framework** (main laws and implementation processes):

- Act No. 155/1998 Coll., on communication systems of deaf persons
- Decree No. 64/2008 Coll., on the form of publishing information connected with public administration on the Web for persons with disabilities and Methodological guide for the Decree 64/2008 Coll.
- Directive (EU) 2016/2102 of the European Parliament and of the Council on the accessibility of the websites and mobile applications of public sector bodies

**Main solutions adopted at Palacky University:**

The accessibility of the listed systems is currently being administered in accordance with the aforesaid documents. Project Palacky University as a Complex Institution (2017–2021) is currently taking place at UP. The project will also encompass intensive work on the issue.

#### **d. Accessibility of study materials for students with sensorial impairments and students with specific learning disorders**

**National legislative framework** (main laws and implementation processes):

- Act No. 121/2000 Coll., on copyright and related rights
- Act No. 155/1998 Coll., on communication systems of deaf persons

**Main solutions adopted at Palacky University:**

The principles of accessibility of the study documents for students with sensory disability are described in the stated directive (B3-14/4-SR). Concurrently, Methodology of text adjustment for readers with visual impairments (Teiresiás, Brno, 2014) is applied as well. In accordance with the methodology, the edited documents are published with the help of UP Library in the section for users with special needs ([http://library.upol.cz/arl-upol/cs/index/?src=upol\\_us\\_cat-19](http://library.upol.cz/arl-upol/cs/index/?src=upol_us_cat-19)) and are accessible not only by students of UP but by public as well.

#### **e. Methods and tools for monitoring accessibility**

**National legislative framework** (main laws and implementation processes):

- Convention against Discrimination in Education
- World Declaration on Education for All
- Convention on the Rights of Persons with Disabilities
- European Disability Strategy 2010-2020: A Renewed Commitment to a Barrier-Free Europe
- National Plan for the Promotion of Equal Opportunities for Persons with Disabilities 2015—2020
- Decree No. 64/2008 Coll., on the form of publishing information connected with public administration on the Web for persons with disabilities and Methodological guide for the Decree 64/2008 Coll.
- Act No. 111/1998 Coll., on universities and amending other acts

**Main solutions adopted at Palacky University:**

A specialized employee deals with this area through methodical guidance. More intensive cooperation is planned within the project Palacky University as a Complex Institution. The project includes a detailed monitoring of accessibility and



subsequent formulation of steps required to diminish or at least mitigate the identified flaws or limits.

#### **f. Training activities on accessibility issues**

**National legislative framework** (main laws and implementation processes):

No specific legislation.

**Main solutions adopted at Palacky University:**

Palacky University organizes periodical trainings for academic and non-academic employees, as well as students. These trainings take place at least once a semester (i.e. twice a year). Currently there are courses organized in participation with Centre for Lifelong Studies at UP. In addition to short-term trainings/courses dealing with approaches to students with special needs, there are three long-term courses as well.

Short-term courses:

- University student with visual impairment
- University student with hearing impairment
- University student with mobility impairment and somatic illness
- University student with autistic spectrum disorder
- University student with mental illness
- University student with specific learning disorder
- University student with impaired communication skills and other difficulties

Long-term courses:

- Documents and study materials adaptation for students with visual impairment
- Basics in spatial orientation for students with visual impairment
- Communication with students with hearing impairment

Sources:

- <https://www.upol.cz/en/university/basic-information/>
- Legal documents defining studies for students with special needs at UP in Olomouc: <http://cps.upol.cz/wp-content/uploads/2017/09/Pravni-uprava-studia-studentu-se-specifickymi-potrebami-na-UP-v-Olomouci.pdf>



## 2.3 ESADSE (Saint Etienne, France)

### 2.3.1. Description of a good accessibility solution:

**Title:** *Accessible ESADSE-Cité du design*

**Category of accessibility:** accessibility of physical environment; Accessibility and availability of the support services for students with SEN\_ *Special Education Needs*

The Saint-Etienne Higher School of Art and design (ESADSE) is integrated to a specific environment: being merged with a Design center (Cité du design) organizing events and exhibitions, it welcomes visitors and must apply national rules concerning accessibility (buildings entrance, welcome desks, signage).

#### 1. Signage system for more visibility

Orientation is an issue on the site, since the School and Cité du design are located on a vast area called “Manufacture creative district”, distributed on public pedestrian space amongst various buildings, part of them being former XIXth Manufacture renovated buildings (School workshops – sometimes open to the public for exhibitions- and administration), other being a 2009 flat and nice building (“la Platine”) but still with accessibility challenges and a mixed use.

La Platine building welcomes in the same time : a library for students and the general audience , a restaurant, exhibitions rooms, a large agora functioning as an entrance to the site, an auditorium and seminar rooms used both for lessons and public events. It is a unique, long, flat, glass building with several entrances on both sides of the parallelepiped, opening on the tram stop on one side, the creative district manufacture area (public space and several buildings dedicated to creative industries) on the other side. All this configuration can be quite puzzling for any people, even more for people with viewing or orientation troubles.

The building is surrounded by a ditch, designed by the architect to give the impression of a “floating” building. Each entrance of the building consists in a little bridge over the ditch leading to the door. These access can be quite dangerous for people with viewing trouble or just un-attentive people.

To answer these challenges, a more visible signage system and protections had to be adopted. But don't forget that the whole site combines some heritage (ancient building and public space) and copyrights (architects' new building copyright) constraints. Moreover, the Cité du design-ESADSE has to maintain a certain design quality standard. A massive signage system could not be used. It

also had to be rather cheap, public money being spent for these adaptations without extra large budget.

Even though ESADSE-Cité du design had these challenges, it also had resources. Being a design centre, Cité du design has designers in its team. Being an organizer of exhibitions and some special visits for impaired people, it has contacts with disability committees. Cité du design-ESADSE connected with the committee “tourism & disability” of the Region, which made a diagnosis on accessibility (checklist on access to various disabilities). Following their recommendation, simple and graphic solutions were adopted by the designer Noémie Bonnet Saint-Georges :

- guard lines in contrasting colors indicate the doors and the ditch surrounding the “Platine” building. The color is a bright, light green, corresponding to the colors of Cité du design
- larger signage system with more contrast has been added on the glass walls of the building.

The designer used the colors of Cité du design (green and white) and the structure of the walls, made with triangle-shape glass pieces. Directions are given by highlighting specific triangles, which become an arrow. Thus, a subtle but visible signage system has been created, respecting the quality of the building and the site.

The same designer, together with her colleague Eric Bourbon also designed welcome desks adapted to wheelchair heights as well as standing people height, with forms and colors integrated to the building environment.

Having designers on board helped to find smart solutions for some of the orientation and accessibility challenge of the ESADSE-Cité du design site. Of course, it did not resolve everything. adaptations were purely technological (lighting alarm ; classic podotactile bands). Signage on the Manufacture Creative district, a 12ha area with public services, research centres, creative industries, events, and evolutive uses building is still a very challenging issue. Also, when the site welcomes the Biennial with more than 100 000 visitors and dozens of exhibitions and meeting points, the signage system must be reinforced and reinvented, each time. But innovative resources are still present and growing, with the presence of tech companies, telecom ingeneering school , design students and professional, to propose more and more innovative solutions in the future.

## **2. Guided tours for the hearing/seeing-impaired**



The “Biennale Internationale Design Saint-Etienne” is visited by thousands of people. It is also realised by the ESADSE, as well as ESADSE students directly collaborate to the organization.

During the Biennale guided tours for the hearingseeing-impaired are organized.

In this case, apart from student and teacher who curated the exhibitions, the school incites students to get involved as tour guides too. Contemporarily, however, professional guides are hired for visitors with special needs (hearing impairment generally). These guides follow the same breifing as the students and work in close collaboration with them.

### **Why the solutions can be considered innovative**

ESADSE applies national rules concerning accessibility (buildings entrance, welcome desks, signage) in buildings which are part contemporary, part re-use of a XIXth century manufacture. Being in relations with designers, in most of the cases, ESADSE uses designers to invent the solutions to make these adaptations.

Moreover, another important reason why the accessible solutions can be considered innovative, for example referring to services for visitors like “guided tours” is just because of the collaboration between students and professional guides for visitors with special needs. This, in fact, promotes the awareness of everyone (students and visitors) on the issues of inclusion.



## 2.3.2. Accessibility framework at the ESADSE

### Short description of the University and its locations

Founded in 1803, the Saint-Etienne Higher School of Art and Design (in French : l'École Supérieure d'Art et Design de Saint-Etienne - ESADSE) is part of the 46 National Art Schools under the authority of French Ministry of Culture.

It has 350 students divided in 2 departments : Art and Design.

It offers a Bachelor and a Master both in Art and in Design. It also offer a Post Diploma in Design Research (1 to 3 years after the Master) which can be combined with a PdD in partnership with the University Jean Monnet of Saint-Etienne.

Actually, ESADSE is not an University but a higher school of art and design with only 350 students . Its scale and teaching context is very different from an University. The other specificity is that the school is combined to a design centre receiving visitors.

The success of the Biennale internationale Design Saint-Etienne organized by the Saint-Etienne Higher School of Art and Design since 1998 led to the creation of a research and innovation design center: the Cité du design, created in 2005 by the City of Saint-Etienne, the Saint-Etienne Metropole, the Rhone-Alps Region, and the State (Ministry of Culture). It is a platform for observation, creativity, teaching, training and research through design.

Since 2005, the Higher School of Art & Design and Cité du design Saint-Etienne are merged in the same organization. Since 2009, they are located in the same site: the former National Manufacture of Arms of Saint-Etienne, built in 1864.

On this 12 ha of former military area, LIN Agency (Finn Geipel & Giulia Andi) designed the concept of the Cité du design-Ecole supérieure d'art et design Saint-Etienne with:

- 3 renovated buildings from the Manufacture
- The clock building: 3 floors building for School and Design center administration + living studios for Post Diploma students
- The Pedagogical workshop building: 3 floors building for art and design project teaching + printing, digital, media facilities
- The technical workshop building: 2 floors building for making (groundfloor) and 2 classrooms (1st floor)

- 1 contemporary building: la Platine:1 groundfloor building for public exhibitions, library, restaurant, conference and meeting rooms for public use and School use.

The school also uses one of the former buildings of the Manufacture (groundfloor) for the Art Department

The "Manufacture" Area, location of the Higher School of Art & Design and Cité du design Saint-Etienne is now the creative district of Saint-Etienne: a campus for Universities, location for creative industries offices and local medias, kindergarten & primary school on the former industrial buildings of the Arm Manufactory. It is also a place for cultural events: first of it being the Biennale Internationale Design Saint-Etienne (in 2017: 100 000 visitors on the site) .

#### **Statistical Data:**

- Total students: 350
- Total of visitors: average 30000 visitors/year (without Biennial) for exhibitions, events, meetings etc.
- 100 000 visitors on the site in 2017 during the Biennale Internationale Design Saint-Etienne.
- Total employees: School (ESADSE): 60 employees; Design Centre (Cité du design): 40 employees.
- Total students with disabilities: In 2017: 2 students following adapted teaching schedule according to their disabilities: dyslexia + autistic spectrum. No physical or sensitive impaired students for years

Institutional documents related to accessibility:

- 11 Februray 2005 Law on handicap For the Universities (which we are NOT: 2007 Charter of Universities on handicap)

### **Short description of the main design solutions related to environments and services to facilitate the study to students with special needs**

#### **a. Accessibility of physical environment**

**National legislative framework** (main laws and implementation processes):

11 Februray 2005 Law on handicap: it states that all the "establishments receiving public" (buildings hosting activities open to any kind of audience) should be accessible, autonomously, to any people with reduced mobility. It means it



should be accessible to any impaired people ( wheelchair, visually impaired, partially deaf, cognitive troubles etc. + temporary mobility impaired, people with baby carriage etc. ).

**Main solutions adopted at ESADSE:**

- elevators in each buildings
  - ramp access to the surelevated doors
  - impaired adapted WC in each building
  - all the doors are large enough for a wheelchair
  - welcome desks height adapted to a wheelchair
  - signage in braille
  - podotactile lines on staircases and nailed line on the access path to the buildings
  - guard lines in contrasting colors indicating the doors and the ditch surrounding the “Platine” building
  - warning lights associated to the fire alarm
  - Free WIFI accessible for guests in the building and surroundings
- In the exhibitions:
- Seats available for people having difficulties to stay standing up
  - Attention given to the contrast, typography and height of pannels

**b. Accessibility and availability of the support services for students with SEN\_ *Special Education Needs***

**National legislative framework** (main laws and implementation processes):

11 February 2005 Law on handicap for the Universities (which we are not:  
2007 Charter of Universities on handicap)

**Main solutions adopted at ESADSE:**

- Support desk: with only 350 students there is no disability office/desk for students or real overall accessibility policy in the School (except compulsory accessibility in the buildings). The employee in charge of student life: asociative and cultural life, social assistance etc. has a mission of assistance for students with disabilities. To help disable students in their everyday life, she can address the preventive medicine and social assistance services of the University of Saint-Etienne (we are attached to these services for social and health issues).
- Teaching: adapted schedules for students with physical, cognitive or mental special needs. At the moment, there is no student with mobility or



sensitive disability. In case it happens, the school is small enough and the teaching is creative enough to imagine individual adaptation.

- In the exhibitions: special guided visits for deaf or partially deaf people in sign language are punctually organized. A special guided visit for visually impaired people in an exhibition dealing with light has been organized in 2015

### **c. Information and communication accessibility**

**National legislative framework** (main laws and implementation processes):

11 February 2005 Law on handicap

**Main solutions adopted at ESADSE:**

Inclusive visual design on ESADSE and Cité du design websites.

Description of pictures and videos displayed on the websites

### **d. Accessibility of study materials for students with sensorial impairments and students with specific learning disorders**

**National legislative framework** (main laws and implementation processes):

11 February 2005 Law on handicap

**Main solutions adopted at ESADSE:**

Adapted schedules for students with physical, cognitive or mental special needs. At the moment, there is no student with mobility or sensitive disability. In case it happens, the school is small enough and the teaching creative enough to imagine individual adaptation.

### **e. Methods and tools for monitoring accessibility**

**National legislative framework** (main laws and implementation processes):

- 11 February 2005 Law on handicap
- label "tourism & disability"

**Main solutions adopted at ESADSE:**

In 2011, the Cité du design had the intention to apply to the national label "tourism & disability". We asked for the help of the Saint-Etienne Metropolitan government committee for disability. They connected Cité du design with the committee "tourism & disability" of the Region, which made a diagnosis on accessibility (checklist on access to various disabilities). Several modifications have been made following this diagnosis:

- welcome desks height adapted to a wheelchair



- podotactile lines on staircases and nailed line on the access path to the buildings
- guard lines in contrasting colors indicating the doors and the ditch surrounding the “Platine” building
- larger signage system with more contrast
- warning lights associated to the fire alarm

#### **f. Training activities on accessibility issues**

**National legislative framework** (main laws and implementation processes):

11 February 2005 Law on handicap

**Main solutions adopted at ESADSE:**

Punctual conferences about Design for all, art and disability issues proposed for students. The employee in charge of student life asked for training course about disability management. It has not been considered as a priority training subject for the moment but the school is not closed to work globally on this matter in the future.

At Cité du design: the 2 people in charge of overall welcome of the public and educative activities had a 3 days training in 2011.

The educational activities manager trained internally and gave awareness about impaired visitors to the guides and educators. She organizes punctual visits in sign language. The training of the people at the reception desk has a time dedicated to the welcome of impaired people.



## 2.4 Karlsruhe Institute of Technology (Karlsruhe, Germany)

### 2.4.1. Description of a good accessibility solution:

#### **Title: *Accessibility Lab***

**Category of accessibility:** Accessibility and availability of the support services for students with SEN\_ *Special Education Needs*; Information and communication accessibility.

- Research in the Field of Assistive Technologies: The SZS (Study Centre for the Visually Impaired Students) is carrying out research on novel approaches to assistive technologies and new ways to information technology. For instance, the SZS investigates and develops web-based methods to semi or fully automated transfer of literature and tactile printing.
- Testing and Adapting of new Technical Devices: there are spatial and economic resources to test new technical devices within our lab. Smartwatches or tablets, for example, can be adapted to the needs of people with visual impairment. We also give manufacturers of assistive technologies an opportunity to present their new products.
- Accessible Laboratory and Working Environments: we can set up or simulate the equipment of laboratory or working environment for our students with visual impairment and adapt the environment to their individual needs.
- Laboratory for Tactile and 3D Printing: at our printing lab, we develop together with our students and the teaching staff of the KIT tactile and 3 dimensional teaching material to support our students with visual impairment. There are 3D printers with various printing technologies, printing volume and materials as well as several tactile embossers which can print up to A3 double-sided.
- Test platform for Research and Development: the Accessibility Lab is a place where researchers and developers can share their ideas about IT-based assistive technologies with potential users and experienced staff of the SZS.
- Knowledge Sharing by Training: we want to share our expertise with external educational institutions that support people with visual impairment by offering workshops and training courses. Key topics include procedures to



make documents and graphics accessible and how to use current and new assistive technologies.

### **Why the solution can be considered innovative**

Assistive technologies for people with visual impairment are very expensive and need a long lead time to be developed. Moreover, most of the laboratories and working environments in the STEM fields (science, technologies, engineering and informatics) are not accessible. Many new technologies of applied research, however, could facilitate the daily life of handicapped people.

The SZS aims to interlink research, teaching and support in the Accessibility Lab at the Karlsruhe Institute of Technology. We develop and test innovative accessibility concepts for persons with visual impairment.



## 2.4.2. Accessibility framework at the KIT

### Short description of the University and its locations

The Karlsruhe Institute of Technology (KIT) was founded in 2009. The KIT is the successor organisation of the University of Karlsruhe (TH) founded in 1825. The KIT has developed to a modern location of research and development in natural sciences, engineering, economics, social sciences and humanities which is organized in eleven departments.

### Statistic Data:

- Total students: 25.892 in 2016
- Total employees: 9.239 in 2016
- Total students with disabilities: German law does not allow statistics on the number of students with disabilities. However, according to a study of the German Student Union DSW (Deutsches Studentenwerk) 8% of the students have disabilities which is extrapolated to KIT's 1.750 students. The study showed the distribution of the impairments in the following way: 45% mental illness, 20% chronic somatic illness, 10% multiple impairments, 6% specific learning disability, 5% visual impairment, 5% other illnesses, 4% reduced mobility, 3% hearing impairment, 3% psychological and chronic somatic illness (rounding differences possible)

### Institutional documents related to accessibility:

- Results of a study regarding "studying with impairments in Germany" ([http://best-umfrage.de/wp-content/uploads/2016/01/english\\_summary.pdf](http://best-umfrage.de/wp-content/uploads/2016/01/english_summary.pdf))
- Key results of the above mentioned study ([http://best-umfrage.de/wp-content/uploads/2016/01/36\\_Studying-with-Impairments-DIN\\_A3\\_0.pdf](http://best-umfrage.de/wp-content/uploads/2016/01/36_Studying-with-Impairments-DIN_A3_0.pdf))

### Short description of the main design solutions related to environments and services to facilitate the study to students with special needs

#### a. Accessibility of physical environment

##### National legislative framework (main laws and implementation processes):

- Disability Equality Act (Gesetz zur Gleichstellung von Menschen mit Behinderungen), § 8 Herstellung von Barrierefreiheit in den Bereichen Bau und Verkehr.



- Recommendation of the German Rectors' Conference "University for all" in 2009 (HRK-Empfehlung „Eine Hochschule für Alle“ 2009): the aim is to allow equal opportunities and self-determined participation.
- Basic Law Section 3(3) (Grundgesetz §3 Absatz 3): No person shall be disfavoured because of disability.
- Framework Act for Higher Education (HRG) and the State University Law Section 2(3) of Baden Württemberg (Hochschulrahmengesetz und Landeshochschulgesetz § 2 (3): The universities shall ensure that students with disabilities are not disfavoured during their studies and that they can take part in the university courses preferably independently.
- Examination regulations of the study programmes at universities in Baden Württemberg shall include information about disability compensation for persons with disabilities.

**Main solutions adopted at KIT:**

A committee together with the disability representative are working together when students face barriers at KIT. They try to solve the problems as fast as possible by building new ramps for wheelchairs, power sockets in lecture rooms for students with visual impairment etc. On campus, there are two areas with way-finding systems.

Moreover, there is also a web-based database, which contains information about the accessibility of buildings and rooms at the KIT:  
<https://smartcampus.cm.tm.kit.edu/>

**b. Accessibility and availability of the support services for students with SEN\_ *Special Education Needs***

**National legislative framework** (main laws and implementation processes):

- Framework Act for Higher Education (Hochschulrahmengesetz)

**Main solutions adopted at KIT:**

At KIT, the disability representative offers counselling services and study support. Sign language interpreting is usually organized by the students themselves. The state bears the expenses.

Once a month, the disability representative offers a meeting place for students with disabilities. Two times during a semester, SZS offers meetings for students with visual impairment.

The former University of Karlsruhe created the Study Centre for the Visually Impaired (SZS) in 1993 from the pilot project "Informatics for the Blind - Studies

for Visually impaired People in Informatics and Economic Engineering" which had been supported from 1987-1992 by the German Ministry of Education and Research in Bonn and by the Ministry of Science and Research of the state Baden Wuerttemberg.

SZS supports and advises visually impaired students and prospective students in all study courses offered at KIT. The cross-disciplinary team continuously develops innovative and individual solutions for accessible studies, especially in STEM (science, technologies, engineering and informatics) fields. At SZS, KIT students have access to comprehensive state-of-the-art equipment and assistive technologies. SZS creates opportunities in order to exchange experience and provide access to our existing networks. Thereby, students with blindness or low vision get the opportunity to study in a self-determined and inclusive way at KIT and to find access to professional life. Together with the Chair of Computer Systems for Visually Impaired Students, SZS conducts research on Assistive Technologies and on new ways of getting access to STEM fields.

In 2010, KIT created the position of a disability representative for students with disabilities and chronic illnesses.

In 2011, KIT established a new professorship computing systems for students with visual impairment.

In 2016, SZS created an Accessibility Lab where new hardware and software are tested and adapted to the needs of the students.

### **c. Information and communication accessibility**

**National legislative framework** (main laws and implementation processes):

- Disability Equality Act (Gesetz zur Gleichstellung von Menschen mit Behinderungen), § 9 Recht auf Verwendung von Gebärdensprache und anderen Kommunikationshilfen , § 11 Verständlichkeit und Leichte Sprache
- Telecommunications Act (Telekommunikationsgesetz), § 45 Berücksichtigung der Interessen behinderter Endnutzer
- Regulation of the Use of Sign Language and Other Communication Aids in Administrative Procedures (Verordnung zur Verwendung von Gebärdensprache und anderen Kommunikationshilfen im Verwaltungsverfahren nach dem Behindertengleichstellungsgesetz)
- Regulation on Barrier-Free Information Technologies (Verordnung zur Schaffung barrierefreier Informationstechnik nach dem Behindertengleichstellungsgesetz).

**Main solutions adopted at KIT:**

The Study Centre for the Visually Impaired offers workspace for students with visually impairment. Assistive technologies, such as computers with screenreader, Braille display, and magnification solutions are available in a separate room. Moreover, there is a video magnifier, large screens for students with low vision, and multi-touch screens.

Additionally, SZS offers mobile devices to students with visual impairment if assistive technology fails temporarily.

In the Accessibility Lab, SZS aims at interlinking research, teaching and support at the Karlsruhe Institute of Technology. We develop and test innovative accessibility concepts for persons with visual impairment. Within the Accessibility Lab SZS offers:

- Infrastructure to develop new solutions for students with visual impairment
- Possibility to test innovative IT-based assistive technologies and to give advice on integrating accessibility features
- Platforms for companies and research institutes to cooperate and present innovative assistive technologies
- Training courses on creating accessible teaching material for staff of educational institutions

**d. Accessibility of study materials for students with sensorial impairments and students with specific learning disorders**

**National legislative framework** (main laws and implementation processes):

- Disability Equality Act (Gesetz zur Gleichstellung von Menschen mit Behinderungen)

**Main solutions adopted at KIT:**

The adaptation service of SZS is available for visually impaired students and their lecturers at KIT. The conversion is an adaption of study material based on the individual working technique of each individual student. The material is converted by SZS and made available to the students on a protected platform. The material can be downloaded and read on a computer with suitable software (e.g. screen reader or braille display) or printed (e.g. in Braille). Many graphics are also available in tactile form. SZS also creates and prints 3D-objects for the students using 3D printers.

Within the framework of disadvantage compensation written exams are individually modified based on the student's needs. SZS processes them



accordingly. Generally, written exams take place at SZS at the same time as the official exam and under the surveillance of a person nominated by the respective institute.

**e. Methods and tools for monitoring accessibility**

**National legislative framework** (main laws and implementation processes):

No specific legislation.

**Main solutions adopted at KIT:**

No specific solutions adopted

**f. Training activities on accessibility issues**

**National legislative framework** (main laws and implementation processes):

No specific legislation.

**Main solutions adopted at KIT:**

Currently, there are two courses regarding accessibility at KIT. Course Accessibility – Assistive Technology for Visually Impaired Persons takes place in the summer term and seminar Assistive Technology for Visually Impaired Persons takes place in the winter term.

The disability representative and SZS offer counselling regarding accessible lectures.



## 2.5 National and Kapodistrian University of Athens (Athens, Greek)

### 2.5.1. Description of a good accessibility solution:

**Title:** *The model of accessibility services of the NKUA*

**Category of accessibility:** All six categories of accessibility involved.

The model of accessibility services provided by the National and Kapodistrian University (NKUA) of Athens follows a student-oriented approach. It is based on the requirements' analysis of the students with disabilities during their studies. Moreover, this model influences their academic environment and the accessibility policy inside and outside the educational institution. The main pillar of this model is the "Accessibility Unit" which provides a number of supportive services, arranged in a three-tier architecture according to their "proximity" to the student: (i) accessibility services addressed directly to the student, (ii) accessibility services applied to the student's environment, and (iii) accessibility promoting services. Below is described the general overview of these logical layers (tiers) of the model, along with their services that are described in the next sections.

#### **1. Accessibility Services Addressed Directly to the Student (Tier 1)**

They are directly dealing with specific requirements of disabled students. They have an immediate impact on a number of their activities, namely:

- participation in the educational process,
- interpersonal communication with the fellow students, the professors, and the university staff,
- transportation and housing accommodation, and
- interaction with their academic environment (e.g. libraries, labs).

Tier 1 includes the following services:

1.1 Students' Needs Recording Service

1.2 Personal Assistive Technologies Service

1.3 Transportation Service

1.4 Accessible Educational Material Service

1.5 Psychological Counseling Service

1.6 Sign Language Interpreting and Video Relay Service

1.7 Volunteerism Service

## **2. Accessibility Services Applied to the Student's Environment (Tier 2)**

Services included in the second tier are related to adjustments made on the academic environment that are required to improve accessibility. These services, although not applied directly on the student, have a direct impact on student's participation in the educational process since they deal with physical access on university's facilities, training of volunteers and university staff, developing guidelines, and providing accessible libraries and labs. The student-oriented approach is still applicable in this layer in the sense that a lot of emphasis and priority on the students' needs is placed on the implemented services.

Tier 2 includes the following services:

- 2.1 Buildings' Accessibility Service
- 2.2 Accessible Libraries and Labs Service
- 2.3 Guidelines Service
- 2.4 Staff and Volunteers Training Service

## **3. Accessibility Promoting Services**

The third layer includes services that attempt to disseminate good practices and reach more people in the community. An effort is made to promote accessibility issues within the university community, the educational system, and even to other social groups outside the academic institution. This influence is achieved through a number of activities like web accessibility evaluations, meetings and events, know-how dissemination, and research projects. The third layer of the model includes services that attempt to disseminate good practices and reach more people in the community. An effort is made to promote accessibility issues within the university community, the educational system, and even to other social groups outside the academic institution. This influence is achieved through a number of activities like web accessibility evaluations, meetings and events, know-how dissemination, and research projects.

Tier 3 includes the following services:

- 3.1 Web Accessibility Evaluation Service
- 3.2 Events Service
- 3.3 Know-How Dissemination Service
- 3.4 Research Service



The Accessibility Unit of NKUA includes four departments:

- a) Electronic Accessibility (e-access),
- b) Structured Environment Accessibility,
- c) Transportation, and
- d) Psychological Counseling.

The permanent personnel that is currently employed in our Accessibility Unit (12 persons in total) includes: in the e-access department, one Electrical Engineer with an MSc in IT and one Computer scientist, both specialized in accessibility, one Digital Document Technician, one Sign Language Interpreter, and one Sociologist for supporting the VS; in the Structured Environment Accessibility department one Civil Engineer and one Mechanical Engineer, both boarded in the University's Technical Services offices for practical reasons; in Transportation department we have 3 drivers (and 2 specially modified Vans) and one secretary; finally, one Clinical Psychologist works in the Psychological Counseling department of the Unit.

### **Why the solution can be considered innovative**

The methodological designing of the services of the Accessibility Unit of NKUA critically takes into account both Design for All and Individual Accommodation approaches. We emphasise the important role of advanced ICT systems for the effective service organization, management and provision and we provide the necessary specific applications. The provided services include: recording of the needs of students, evaluation of students' abilities, provision of Assistive Technologies, accessibility of structure environment, transportation, psychological counseling, provision of accessible textbooks, training of the staff and the volunteers, developing guidelines, accessible workstations in libraries and labs, evaluation of websites' accessibility, structural arrangement of volunteer work for helping the disabled students, Video Relay Service and Sign Language Interpretation for deaf students, organizing seminars and meetings, dissemination of accessibility know-how.



## 2.5.2. Accessibility framework at the NKUA

### Short description of the University and its locations

- established in 1837
- Schools: 8 (Theology; Law; Economics and Political Sciences; Philosophy; Sciences; Health Sciences, Education, Physical Education and Sport Science)
- Departments issuing corresponding degrees: 33
- Bachelor Degrees offered: 33
- Postgraduate programs: 136
- University Research Institutes: 5
- University Hospitals: 2
- Departments under the auspices of the School of Health Sciences: 76
- University Laboratories: 210
- Libraries: 8 School libraries and 2 libraries belonging to the University Club
- Museums: the History Museum of the National and Kapodistrian University of Athens, the Historical Archive of the University, 13 thematic museums
- 238 buildings spread over the whole city of Athens.
- Total students:
  - Undergraduates: 39,088
  - Graduate students (Master): 11,479
  - Graduate students (PhD): 14,240
  - International Students: 5,654
- Total employees:
  - Professors (all ranks) and other teaching staff: 2,104
  - Administrative staff : 1,087
- Total students with disabilities:
  - Students with visual loss: 7
  - Students with hearing loss: 77
  - Students with motor disabilities: 215
  - Students with severe diseases: 742



Institutional documents related to accessibility:

- Internal Rules of Procedure NKUA:
  - article no. 100 specifies the role as well as the status of Accessibility Unit (AU)
  - article no. 5 specifies the organisational and administrative status of the AU
  - article no. 22 specifies the role of the AU in the organisation and execution of teaching
  - article no. 25 specifies the role of the AU for the examination arrangements
  - article no. 88 specifies the role of the AU for the registration of the students
  - article no. 90 specifies the role of the tutors of the students with disabilities in each Department and their relation with the AU
  
- Examination Arrangements for Students with Disabilities – Guidelines for the Proper Ways of Examination of Students with Disabilities: these guidelines are addressed to the members of Teaching and Research Staff and to the students with disabilities, in order for students with disabilities to integrate and attend the National and Kapodistrian University of Athens under equal conditions.
- without legal value: information brochure Accessibility Unit for Students with Disabilities of the National and Kapodistrian University of Athens (Greek only)

## **Short description of the main design solutions related to environments and services to facilitate the study to students with special needs**

### **a. Accessibility of physical environment**

**National legislative framework** (main laws and implementation processes):

- Act No. 4067/2012 General Building Regulations

**Main solutions adopted at NKUA:**

Department of Built Environment Accessibility (as a part of Accessibility Unit, see below) undertakes the following tasks and activities:

- ensures that the new buildings of the University of Athens that are under construction meet the accessibility standards;



- modifies the existing buildings to make them accessible (installation of ramps, lifts, handrails, accessible toilets, special signage for people with vision loss, low wall phone booths and water coolers, and parking spaces for disabled people);
- operates system of beeping sound (using a remote control) at the traffic lights and special navigation routes on sidewalks around the buildings of the University of Athens for people with vision loss.

Accessibility Unit also ensures Transportation Service for Students with Disabilities – The University of Athens has two special vehicles for transporting students with disabilities free-charge from their homes to the university and viceversa.

#### **b. Accessibility and availability of the support services for students with SEN\_ *Special Education Needs***

**National legislative framework** (main laws and implementation processes):

- Act No. 4485/4 August 2017 (Coll. 114A') "Higher Education Act" (Greek only).
- Act No. 4283/10 2014 (Coll. A/189), art. 7 on Establishment of National Policy Council on Education and other provisions (Greek only)
- National implementation of UN Convention on Rights of Persons with Disabilities, article 24 Education: Act no 4074/2012.
- Act. No. 4009 on Structure, operation, quality assurance of studies and internationalization of higher education institutions (Greek only).
- Act No. 3549, article 12,1 (support services for students with disability) on Reform of the institutional framework for the structure and operation of Higher Education Institutions (Greek only).

#### **Main solutions adopted at NKUA:**

There is an Accessibility Unit for Students with Disabilities officially founded and operating after the decision of the Academic Senate (February 23, 2006) and the decision of the Rector's Council (March 22, 2006). Its role has been defined and confirmed in Internal Rules of Procedure of NKUA. The mission of the Accessibility Unit (AU) is to actively realize coequal access to academic studies for students with different abilities and needs, through built-in environmental modifications, Assistive Technologies and access services. The basic tasks of AU follow the requirements of the students with disabilities:



- access to interpersonal communication with members of the academic community,
- access to the built environment of the university,
- access to the printed or electronic educational material,
- access to the board and the presentations in the classrooms,
- access to the exams/tests, and access to the information and the WWW content.

Another part of the provided services is Psychological Counseling for Students with Disabilities: psychosocial support and counseling to all Students with Disabilities. They can ask for support or help with some of the following problems: difficulties in social, interpersonal, and intimate relationships, academic difficulties and exam stress – training on study skills, low self-esteem, stress/ anxiety/ phobias, and other issues that hinder everyday functioning and academic adjustment.

### **c. Information and communication accessibility**

**National legislative framework** (main laws and implementation processes):

- Greek Constitution, article 5 (2): The article defines rights of all persons to have access to the information published in electronic form.
- National implementation of UN Convention on the Rights of Persons with Disabilities, Greek Law 4047, Coll. 88A, April 2012
- Ministerial Decision No. Φ.40.4/1/989 12 April 2012 (Coll. 1301 B'), Article 3 (vi), Suppl. I, § 7 on the Framework of the e-Government services.

**Main solutions adopted at NKUA:**

Department of Electronic Accessibility (as a part of AU) approaches the issue in all its complexity and takes responsibility for:

1. Assessment (Identification of special needs of students, Assign the appropriate Assistive Technologies to specific needs).
2. Personal Assistive Technologies (Proposal for appropriate Assistive Technologies, Configuration and training, Technical support).
3. Information Provision (Development and maintenance of the Accessibility Unit's web site, Organization of workshops and seminars, Production of brochures and leaflets).

4. Accessible workstations in academic libraries (workstations for persons with blindness, low vision, physical disability, and more general for the print-disabled or deaf persons).

5. Provision of accessibility expertise (Provision of accessibility tools and guidelines, Provision of accessibility specifications, Evaluation of Websites for accessibility).

6. Cooperation with higher education institutions (Exchange of experiences and know-how).

7. Research and development (Support of the Greek language in Assistive Technologies, Standardization Activities, Participation in collaborative research and development projects).

A few examples of the services provided:

- ATHENA Free AT Software Inventory and mATHENA platforms informing and providing persons with disabilities, their facilitators as well the professionals of the domain, with the available costless Assistive Technology (AT) solutions (Open Source or Freeware) In Greek and English.
- Video Relay Service: A service intended to be used by deaf students or hard of hearing and students without speech or with severe dysarthria and generally those who cannot use the phone for interpersonal communication. RS provides remote interpersonal communication in real-time with fellow students, teachers, and the administrative staff of the University.
- 36 Short and detailed Guidelines for the production of accessible educational content (in Greek).
- Accessibility tools and Guidelines: A set of documents including e. g. WEB content accessibility Guidelines, Braille system, The Nemeth system (Greek only)

#### **d. Accessibility of study materials for students with sensorial impairments and students with specific learning disorders**

**National legislative framework** (main laws and implementation processes):

- Ministerial Decision No. ΥΠΠΟ/ΔΙΟΙΚ/98546 24 October 2007 (Coll. 2065 B'): Reproduction of Copyrighted Work for the Benefit of the Blind and the Deaf-Mute and Extension of the Arrangement to the Other Categories of People with Disabilities.

**Main solutions adopted at NKUA:**

NKUA operates a system ERMOFILOS Accessible Academic Textbooks' e-Services for Students with Disabilities which aims to simplify, accelerate, automate and improve all stages of production and distribution of Accessible Digital Manuscripts developed by the e-Accessibility Unit for Students with Disabilities at the National and Kapodistrian University of Athens, following all obligations directed by national legislation. The system incorporates a comprehensive set of online services supporting the whole process of conversion and distribution of academic manuscripts in various accessible digital formats (according to the type of disability) for students who are print-disabled.

#### **e. Methods and tools for monitoring accessibility**

**National legislative framework** (main laws and implementation processes):

- Act No. 3699/2008 Coll., article 34 – responsibility of Ministry of Education and Religious Affairs: operating rules of consultative bodies for monitoring accessibility of physical as well as digital environment at the educational institutions, including availability of accessible study materials.

**Main solutions adopted at NKUA:**

As far as the e-accessibility is concerned, the role of Department of Electronic Accessibility (AU) should be mentioned – Evaluation of Websites for accessibility is set as one of its main responsibilities.

As for the physical accessibility, there is Department of Built Environment Accessibility (AU) being responsible for that point.

#### **f. Training activities on accessibility issues**

**National legislative framework** (main laws and implementation processes):

- Act no. 3699/2008: Special Education of people with disability, article 2– Spec.ed.: aims to ensure to the students with disability accessibility both the physical and digital environment at educational institutions, incl. accessibility related services. Principles of Design for All should be reflected when educational program is being designed, and the assistive technologies should be available.

**Main solutions adopted at NKUA:**

The AU provides periodically Staff and Volunteers Training Services.



## 2.6 Polytechnic University of Bari (Italy)

### 2.6.1. Description of a good accessibility solution:

**Title:** *BE-free@campus* (Barriers and Exclusion-free at campus)

**Category of accessibility:** accessibility of physical environment.

The solution is a project developed at Polytechnic University of Bari for Android and iOS mobile devices with the aim of providing an assisted navigation system for disabled people within the university campus. It provides them with an assisted navigation system through the university buildings (spaces and environments). In fact, the smartphone application helps students with disabilities (and all other people) in orienting themselves in complex spaces, offering alerts related to accessibility at various levels of each university building. The App is completed by a map classifying accessibility to the School's facilities. The embedded routing engine takes advantage of the crowd-sourced OpenStreetMap (OSM) project, whose maps has been enriched with new tags providing accessibility data. The engine has been extended in order to provide multi-level indoor navigation.

The proposed framework provides the following features, as shown in Figure 1.

- A) Maps are loaded from the OpenStreetMap server.
- B) Maps are enriched with indoor accessibility tags and semantic annotations for POIs via JOSM editor.
- C) The mobile client includes a Mobile Augmented Reality (MAR) view for semantic-enhanced POI discovery.
- D) The mobile client includes an engine for indoor/outdoor accessibility-conscious navigation.

The application screenshots are shown in Figure 2. The routing engine was extended to support novel features: (i) indoor navigation in multi-level buildings; (ii) identification of accessible paths in a travel; (iii) accurate indoor positioning. Global Positioning System (GPS) may not work inside buildings due to lack of reliable reception of satellite signal. Wi-Fi access point trilateration is useful in indoor spaces, but it generally suffers from signal instability due to multipath propagation. Therefore, the tool complements Wi-Fi with the IndoorAtlas API, based on Earth's Magnetic Field (EMF) for indoor location discovery. Using IndoorAtlas, the smartphone performs measurements of magnitude and direction of the EMF affected by the local structures of the building, via the embedded



magnetometer. The whole campus environment was surveyed for collecting reference EMF values. This data acquisition process is simpler and more robust than other solutions such as inserting reflective tags on landmarks throughout a built space.

Finally, the navigation engine exploits the user profile to compute the most suitable path from the user position to the selected POI. The routing engine estimates time delay (in seconds) due to the accessibility level. For each route segment type (stairs, elevator, corridor), the corresponding nominal speed and priority can be specified. An obstacle defines a barrier and whether it can be passed by the user according to her disabilities. A penalty is modeled as an estimated time delay (in seconds) due to the barrier. Particularly, penalties are extracted from the user-specific mobility profile, taking into account the following cases: (i) user and POI are at different floors; (ii) user and POI belong to different buildings; (iii) POI has any accessibility issue. The route is automatically recalculated when the system detects the user is not following the suggested path. In case of unexpected obstacles, e.g., a locked door or out-of-order elevator, the user can report it through the GUI: the system backend infrastructure is alerted and can trigger a map temporary update as well as a maintenance intervention; meanwhile, the user's navigator calculates a new route to destination.

The MAR client is depicted in Figure 3. The approach is grounded on a general method for annotating OSM maps. OSM map entities are annotated to provide further location-based resource discovery, as well as indoor and accessibility information management. A user mobility profile contains the routing parameters weighted with respect to the user's disabilities. In addition to the mobility profile, each user has an interest profile modeling her preferences for POI discovery. It is a semantic annotation expressed with respect to a reference ontology useful for exploiting reasoning features enriching the MAR explorer. Outcomes are displayed as color-coded markers on the display adopted as device camera viewfinder; they correspond to the real direction and distance of each POI from the user. By touching a marker, the user can see result details, also in terms of missing and/or conflicting characteristics between her profile and the POI.

Future work includes: integration of reasoning and path calculation features in a single engine; deeper AR integration through computer vision technologies; speech-to-text support for voice-based queries; full voice directions during navigation to support visually impaired people.



### **Why the solution can be considered innovative**

The project proposes a novel framework and system for a mobile navigation assistant fit for the purpose of moving within a complex built space. Typical systems lack systematic information about accessibility Points Of Attention (POAs) such as entrances, stairs/elevators, sidewalks and obstacles, which are fundamental for barrier-free route planning for people with mobility impairments. The solution system provides the following innovative features: annotation of accessibility information in the crowd-sourced OpenStreetMap (OSM) cartography; semantic description of Points Of Interest (POIs); a mobile Augmented Reality (AR) user interface; a built-in routing engine with support for both outdoor and indoor positioning and navigation in multi-level buildings. A fully functional app was developed for Android and iOS mobile devices. Its effectiveness in POI discovery and accessibility-conscious navigation were tested in the campus of the Polytechnic University of Bari.



## **2.6.2. Accessibility framework at the Polytechnic University of Bari**

### **Short description of the University and its locations**

Polytechnic University of Bari is an Italian public university founded in 1990, when the well-established Faculty of Engineering and the newly-founded Faculty of Architecture, which at that time were both part of the University of Bari, were brought together. Later the Second Faculty of Engineering was created in Taranto. The Faculty of Engineering, which dates back to 1943, at that time only offered a Civil Engineering Degree Course. Over the course of time, degree courses in Electrical Engineering, Mechanical Engineering, Electronics Engineering, Management Engineering, Computer Science Engineering, Environmental Engineering and Building Engineering–Architecture, together with an Industrial Design Degree Course, were added.

Polytechnic University of Bari now offers a wide range of study opportunities, consisting in eight First Level Degree courses, eleven Second Level Degree courses and two Five-Year Second Level Degree courses, along with many Postgraduate courses and Ph.D.'s. Students are enrolled, in different locations in Bari (4 locations), Foggia and Taranto.

- Total students: approximately 11.000

- Total employees: approximately 600 (300 teachers and 300 administrative staff)

- Total students with disabilities:

89 students, of which: 11 with motor difficulty, 1 blind, 1 with difficulty in sight, 1 with hearing difficulties; 7 with specific Learning Disorders.

others are more or less affected by oncological and cardiac pathologies.

- No further institutional documentation related to accessibility is available

Most of information listed above can be get through the Polytechnic website, at the pages:

<http://www.poliba.it/it/didattica/disabilita-e-dsa>

<http://www.en.poliba.it/university/history>



## **Short description of the main design solutions related to environments and services to facilitate the study to students with special needs**

### **a. Accessibility of physical environment**

**National legislative framework** (main laws and implementation processes):

- Circular n. 4809 dated 19 June 1968 ("Regulations for ensuring the use of public buildings by the physically disabled and for improving access in general")
- Law n.13/1989 ("Measures for overcoming and eliminating architectural barriers in private buildings"), extended to public buildings, spaces and services with DPR n.503/1996
- MD n.76/2008 ("Guidelines for overcoming architectural barriers in areas of cultural interest").

**Main solutions adopted at Polytechnic University of Bari:**

The Polytechnic University of Bari has developed a project for the application "BE-free@campus" (Barriers and Exclusion-free at campus), which can be downloaded to smartphones. It provides disabled persons with an assisted navigation system through the spaces and environments of the School. The smartphone application assists students with disabilities (and all others) in orienting themselves on campus, offering alerts relative to accessibility to the spaces located on the various levels of its building. The App is completed by a map classifying accessibility to the School's facilities.

### **b. Accessibility and availability of the support services for students with SEN\_ *Special Education Needs***

**National legislative framework** (main laws and implementation processes):

- Law n.17/1999 (integrating law n.104/1992: "Framework law for the assistance, social integration and rights of handicapped persons")

**Main solutions adopted at Polytechnic University of Bari:**

In order to respond to the specific necessities of all its students (including those with "special needs"), The Polytechnic University of Bari, has implemented a "Disability Secretariat" that coordinates all activities for university students with disabilities and with LD. The Secretariat provides information on:

- deadlines and methods for requesting the economic benefits for students with disabilities (provided for by law);
- technological aids;
- tutoring services;



- mediation with teachers;
- support for international exchanges;
- personalized transportation service to reach the Politecnico sites.

#### **c. Information and communication accessibility**

**National legislative framework** (main laws and implementation processes):

See in output 01 mostly the following laws:

- Law n.4/2004 ("Stanca" law: "Measures favouring access to information tools by disabled subjects")
- DPCM 30 April 2008 ("Technical regulations disciplinating accessibility to didactic and educational instruments in favour of students with disabilities")

**Main solutions adopted at Polytechnic University of Bari:**

In the Polytechnic University of Bari, upon requests from students and/or teaching staff, actions of support and consultancy are available to identify the most suitable measures and aids for each individual case (in some cases acquired directly by the University, when budgeting allows, and loaned to students free of charge).

#### **d. Accessibility of study materials for students with sensorial impairments and students with specific learning disorders**

**National legislative framework** (main laws and implementation processes):

- Ministerial Decree 12 July 2011 ("Educational Rights of Alumni and Students with Specific Learning Disorders")

**Main solutions adopted at Polytechnic University of Bari:**

the Polytechnic University of Bari offers to students with special needs some facilitations for the acquisition of teaching material, also through a simple and generic photocopy service of the reference texts.

#### **e. Methods and tools for monitoring accessibility**

**National legislative framework** (main laws and implementation processes):

No specific national legislative regulations have been developed, but the CNUDD (National Council of University Delegates to Disability-Related Issues, recognized in 2001 as a national body for the coordination and guidance of actions in favour of students with disabilities) provides general indications for the



preparation of appropriate and standardised services inspired by shared principles of integration of students with disabilities.

**Main solutions adopted at Polytechnic University of Bari:**

Monitoring, as a control activity on the correct application of laws and good practices, is mainly done by the Rector Delegate to Disability. He participates in the work of the CNUDD (National University Conference of Disabled Delegates), which in its guidelines further specifies what the law provides. In particular, he sets himself as a constant point of reference for the University for disability issues, coordinating both the activity of the Department's referents and their responsible presence in the University, and the activities of the staff of the Disability Office.

Anyhow, no specific monitoring tools have been developed at Polytechnic University of Bari.

**f. Training activities on accessibility issues**

**National legislative framework** (main laws and implementation processes):

No specific national legislation has been developed on training activities on accessibility issues. All initiatives are promoted and developed on a voluntary basis.

**Main solutions adopted at Polytechnic University of Bari:**

The "Disability Secretariat" coordinates promotional and awareness-raising activities for university students with disabilities and with LD. In particular, it provides information on initiatives on these specific issues promoted or developed at the Polytechnic, also in collaboration with local public and private entities.

No specific compulsory didactic activities related to "design for inclusion" are included in the student's study plans.



## 2.7 Norwegian University of Science and Technology (Trondheim, Norway)

### 2.7.1. Description of a good accessibility solution:

#### **Title: *Accessibility solutions at NTNU***

**Categories of accessibility:** accessibility of physical environment; methods and tools for monitoring accessibility; training activities on accessibility issues.

#### **1. Accessibility of physical environment at NTNU**

Planners have been aware of accessibility when creating university buildings of Norwegian University of Science and Technology (NTNU) in the 1970s.

One of the examples is the University Centre at Dragvoll in Trondheim, which has received a number of awards for its architecture. The architecture competition in 1971 was won by Henning Larsen Architects Office in Copenhagen. The project was based on a new concept of glass-covered “streets”, and was built in 1978. Later, this concept was very popular in Nordic countries, because of energy aspects, good maintenance during winter, and also providing natural meeting places. The facility provides a good basis for implementing the seven principles of Universal Design. In relation to the principle of equal opportunities for use, the entrances to the building are via the accessible automatic doors and a number of lifts are centrally placed in the “streets”. With no need for long detours to reach the destination and with clear signs, the principle of simple and intuitive use and easily comprehensible information is well handled. The principle of good sizes and space for access and use is enhanced by the wide “streets”, which serve as a meeting place as well. The information desk and computer stations are furnished at a height suitable for users in a wheelchair. All auditoriums are adapted for users in a wheelchair to be able to sit with the others students.

NTNU in Trondheim, Business School (2014, Architect: Rambøll), is an example of the new building in university campus in Trondheim. This building was built in accordance with the Universal design principles that are implemented in Norwegian legislation. The entrance is easy to find by people with visual impairments thanks to the glass door marking and tactile paving, as well as the tactile orientation plan, which is situated at the entrance hall. Navigation and wayfinding within the building is very good, because of the atrium type of the

layout, which helps to identify all floor levels and main areas. Moreover, the glass walls of the seminar rooms offer good visual contact within the building. The furniture reflects the user diversity, as there are various height levels of the tables and information services in the circulation areas of the building.

NTNU in Gjøvik, Student Centre (G-bygget, 2006, Architect: Futhark) was created by transformation of a laboratory building (from 1960s) into a university centre, which consists of student services, library, canteen and meeting places. The solution has a conscious relationship with the existing building, utilizing and refining its qualities. Most changes are carried out inside the building, but a construction of volumes added to the building's southern façade forms a new entrance part. The entrance is good articulated and visible thanks to the tactile paving and contrast marking of the glass doors.

NTNU in Gjøvik, Building-A was renovated in 2015 by Industribygg. The concept of the building renovation was based on implementation of the Universal Design principles, such as the accessibility, easy orientation and use of the building for people with various disabilities. Wide corridors, glass walls, colour contrasts and good signage provide easy movement and wayfinding within the building.

## **2. Methods and tools for monitoring/testing accessibility**

The Norwegian Research Laboratory for Universal Design, NTNU in Gjøvik, is the largest of its kind in Europe. At the laboratory, all matters related to vision, hearing and mobility with regard to buildings, outdoor areas, transport and design are studied.

The laboratory was established in 2010 and is fully equipped for research in different scientific areas. Amongst others, the laboratory offers facilities for studying our senses – such as hearing and vision, full-scale testing, workshops, rapid prototyping as well as traditional model building. These facilities make it possible to carry out research and lecturing in both theoretical and practical levels. The interdisciplinary research, moreover, brings forces from the department of health and social sciences, design/architecture, building construction technology, ICT/smart home technology, media technology, etc. together towards a common goal: a universally designed society.

This laboratory has conducted various tests of the design criteria related to the building code, especially the aspects of accessibility that are tested with statistically qualified research methods. Some of the results from the laboratory

test have been implemented in the revision of the Norwegian building code in 2015.

The laboratory consists of three main parts:

- Full Scale Lab
- The lecture room
- Human Senses Lab

Full Scale Lab is equipped with building elements for various types of construction. This experimental setup provides a unique possibility to conduct full-scale experiments, both interior and exterior wise. For example, the lab provides the possibility to test minimum widths and maximum slopes on a ramp indoor by simulating various outdoor climates – an arrangement that undoubtedly makes randomized tests more efficient.

The lecture room is the knowledge-exchange hub of the lab. The room is equipped to host 24 people and is frequently used for lectures, demonstrations and meetings. The experiments conducted in the full-scale lab is directly transmitted to the room via a wall cube, which gives other researchers and students the possibility to observe without disturbing the activity going on in the lab.

The Human Senses Lab conducts research on issues related to vision and hearing – in relation to the principles of Universal Design. The lab is designed so that both visual and auditory experiments can be performed in different conditions.

### **3. Training activities on accessibility issues**

Sustainability, innovation and Universal Design are the three important, strategic focus areas in education and research at NTNU. With the objective of implementing this strategy in education, all second-year bachelor students at NTNU in Gjøvik (about 700 students) do a mandatory twenty-four hour activity called “Idelab 24” in cross-professional teams. Students from three departments are mixed in about 120 groups, each containing two students from health science, two from information & technology, and two from the engineering & management department.

NTNU in Gjøvik also offers courses on Universal Design in the curriculum of the third year of bachelor programs, for example:

- “Universal Design and welfare technology” (15 ECTS) within the Occupational Therapy Program,
- “Universal Design” (10 ECTS) within the Technology Design and Management Program.

NTNU in Trondheim, the National Coordinator of Accessibility in Higher Education (Universell) in Norway, has coordinated a European funded project (Erasmus+ Programme): Universal Design for Learning in Higher Education – License to Learn (UDLL) in 2014-2016. This project has investigated and challenged the role of the students, the teachers, the student support services and management and policy makers in implementing Universal Design in Higher Education. One of the project outputs is a publication: “Universal Design for Learning. Best Practice Guideline.”

### **Why the solution can be considered innovative**

The Norwegian University of Science and Technology (NTNU) is a leader in the field of accessibility to higher education in Norway. This university is also the National Coordinator of Accessibility in Higher Education (Universell) and provides information and networking for all universities in Norway.

The Norwegian Research Laboratory for Universal Design, as a part of NTNU in Gjøvik, is a unique laboratory for research and studies on the relationship between humans and the built environment. This laboratory is the largest of its kind in Europe. At the laboratory, all matters related to vision, hearing and mobility with regard to buildings, outdoor areas, transport and design are studied.



## 2.7.2. Accessibility framework at the NTNU

### Short description of the University and its locations

The Norwegian University of Science and Technology (NTNU) is the largest university in Norway, with a history dating back to 1910, and a tradition going back to 1767 - the Royal Norwegian Society of Sciences and Letters (DKNVS).

The university offers several Bachelor's and Master's degree programs in the natural sciences, social sciences, teacher education, humanities, medicine and health sciences, economics, finance and administration, as well as architecture and the arts. NTNU's social mission is to create knowledge for a better world and deliver solutions that can change and improve everyday life. Two researchers employed at NTNU have received Nobel Prizes: May-Britt Moser and Edvard Moser (2014).

NTNU is headquartered in Trondheim, with campuses in Gjøvik and Ålesund. NTNU has eight faculties in addition to units such as the NTNU University Museum and the NTNU University Library:

1. Faculty of Architecture and Design (AD)
2. Faculty of Humanities (HF)
3. Faculty of Information Technology and Electrical Engineering (IE)
4. Faculty of Engineering (IV)
5. Faculty of Medicine and Health Sciences (MH)
6. Faculty of Natural Sciences (NV)
7. Faculty of Social and Educational Sciences (SU)
8. Faculty of Economics and Management (OK)

- Total students:

- 40 181 registered students in 2017
- 3460 international students in 2017
- 3335 registered students in further education programmes and experience-based master's in 2016
- Total employees: approx. 6 900 full-time equivalent staff
- Total number of students with special educational needs: 2 800 students with special needs (7%) – mostly students with learning difficulties (e.g. Dyslexia)

Institutional documents related to accessibility:



- Læringsmiljø for studenter med funksjonsnedsettelse Handlingsplan 2013-2017 (Learning Environment for Students with Disabilities Action Plan 2013-2017).

### **Short description of the main design solutions related to environments and services to facilitate the study to students with special needs**

Norway is one of the leaders in implementing the accessibility and Universal Design principles into the legislation and governmental programmes (e.g. national strategies and action plans). The process has started since the mid 1960-ties. In 1976, the Norwegian building regulations were revised concerning the accessibility and usability of the public buildings.

Early after the creation of the Universal Design principles (1997, USA), Norway started testing this concept in 1998. The first action programme for Universal Design was completed in 2002-2004. The next Action Plan 2005-2009 (Plan for Universal Design in Key Areas of Society) helped to implement Universal Design in the building legislation in 2008.

In January 2009 (revised in 2013), the Anti-Discrimination and Accessibility Act (the Act relating to a prohibition against discrimination on the basis of disability) came into force, which ensured the implementation of Universal Design in all areas of society. This act defines Universal Design as: “the design or the adaption of the main solution in the physical world, including information and communication technology (ICT), in such a way that it can be used by as many people as possible.”

The universities and university colleges have to respond to the act, including the following areas:

- Buildings and outdoor areas should be universally designed.
- ICT solutions (e.g. websites, e-learning systems and pedagogical apps) must be universally designed.
- Students with disabilities shall have a right to suitable individual accommodation of the place of learning, teaching, teaching aids and examinations to ensure equal training and education opportunities.

The implementation of the Anti-Discrimination and Accessibility Act was also supported by the Action Plan 2009-2013: Norway Universally Designed by 2025.

In 2013, Norway ratified UN Convention on the Rights of Persons with Disabilities (UNCRPD), which is the basic legislative document for ensuring the rights of all people with disabilities.

At present, Norway has the Action Plan for Universal Design 2015-2019 with the aim to create “a society in which everyone can participate”. This action plan highlights that Universal Design benefits both individuals and society. Also, the importance of education and work is emphasized. One of the priorities in the action plan is Universal Design of information and communication technology (ICT).

#### **a. Accessibility of physical environment**

**National legislative framework** (main laws and implementation processes):

- Circular T-5/99E Accessibility for All (1999) consists of two parts: Part 1. Accessibility and Planning, written by the Ministry of the Environment, addresses how accessibility in the physical surroundings and the interests of people with disabilities can be safeguarded and promoted by means of planning in accordance with the Planning and Building Act; Part 2. The requirement for access to buildings - exemptions and dispensation, written by the Ministry of Local Government and Regional Development, deals with the statutory requirement for accessibility laid down in section 77 of the Planning and Building Act, which defines the requirements regarding the usability of buildings. A central issue in both parts of this circular is the principle of Universal Design, the aim of which is to ensure that everybody is able to use the same physical solutions to as great an extent as possible, in terms of buildings, outdoor areas and modes of transport. The purpose of the circular is to underline the importance of ensuring that the principle of Universal Design is ascribed priority in the building authorities' treatment of applications for planning permission and approval of completed buildings. Correct application of the rules will render society more accessible and promote fulfilment of the objective of employment and social participation for people with disabilities.
- The Planning and Building Act (1997, revised in 2008) specifies the requirements for accessibility in section 77. In 2008, the term “accessibility” was replaced by “Universal Design” as a main goal to achieve overall accessibility, usability and safety for all people. Universal design is about

everybody being able to use a building or an area. The key word is “everybody”.

The more detailed rules regarding accessibility and Universal Design can be found in the

- Regulations on technical requirements for building works (Technical Regulations, TEK10) set by the Ministry of Local Government and Regional Development in March 2010.

Several national standards for universal design have been published in Norway:

- NS 11001-1:2009 Universal design of building constructions - Part 1: Buildings open to the public (published in English).
- NS 11001-2:2009 Universal design of building works - Part 2: Housing (published in English).
- NS 11005:2011 Universal design of developed outdoor areas - Requirements and recommendations (in Norwegian only).
- NS 11010:2011 Accessible tourist destinations - Registration of priority requirements and recommendations (published in English).

#### **Main solutions adopted at NTNU:**

Sustainability, innovation and Universal Design are the three important, strategic focus areas in education and research at the Norwegian University of Science and Technology (NTNU).

Since 2003, NTNU is the National Coordinator of Accessibility in Higher Education in Norway (Universell), which provides networking and useful information at the website ([www.universell.no](http://www.universell.no)) to make higher education more accessible to students with disabilities. From 2007, the National Coordinator has conducted several national projects on Universal Design:

- Universal Design as a tool to make an inclusive learning environment
- Universal Design as a theme in the curriculum (What does e.g. an architect student learn about universal design?)
- Accessible literature and study materials

NTNTU (Universell) is the Norwegian representative in the European Higher Education Accessibility Guide (HEAG) project, and was active in the establishment of the Nordic Network for Disability Coordinators (NNDC).

The Norwegian Research Laboratory for Universal Design in Gjøvik, as a part of the Norwegian University of Science and Technology (NTNU), is a unique laboratory for research and studies on the relationship between humans and the

built environment. This laboratory has conducted various tests of the design criteria related to the building code, especially the aspects of accessibility that are tested with statistically qualified research methods.

**b. Accessibility and availability of the support services for students with SEN\_ *Special Education Needs***

**National legislative framework** (main laws and implementation processes):

Since 1999, all higher education institutions (HEIs) in Norway are required to have a contact person for students with disabilities, and also an action plan to make each HEI more accessible. This requirement was introduced by the Ministry of Education, partly as a response to the development of a national policy of inclusiveness in all parts of the society. In accordance with overall national policy - to make each person part of the community, services for students with disabilities should be integrated within the services to all students; it means that support services supposed to be a natural part of the student counselling services – inclusive to all students.

Higher Education Act – The Act relating to universities and university colleges (2005) clearly defines that the HEIs are responsible for the overall accessible learning environment, which also includes students with special needs. This act specifies that the learning environment should follow the guidelines of Universal Design; this includes buildings and outdoor facilities, but also teaching materials.

Accessible learning environment in HEI includes: student counselling services, physical/technical accessibility and adaptation of exams. All HEI in Norway have student counselling services. The Technical Division of the HEI is responsible for accessibility of the buildings and outdoor areas.

Since 2005, all HEIs in Norway are also obliged by law to have a learning environment committee composed of both staff and students, which is responsible for the overall learning environment of the institution.

**Main solutions adopted at NTNU:**

Services for students with disabilities at NTNU are integrated within Student Services Division in line with national inclusive policy in Norway. The main idea is that: “disability shouldn't prevent you from studying what interests you and what you have the ability to achieve.” NTNU offers various support services for students with special needs, for example:



1. Mentoring
2. Reading room (work stations) accommodations
3. Borrow audio or Braille textbooks
4. Sound Recordings
5. Help with taking notes
6. Delayed deadlines/extra time
7. Follow-up meetings
8. Courses for students with dyslexia
9. Study techniques and motivation
10. Mastering exams

### **c. Information and communication accessibility**

**National legislative framework** (main laws and implementation processes):

In Norway, accessibility and Universal Design of information and communication technology (ICT) is being mandated by the Regulation regarding Universal Design of ICT solutions, which came in force in July 2013. This was an important milestone for ICT accessibility in Norway. By ICT solutions, the regulations specify two kinds of ICT:

- Web solutions, such as websites and mobile applications.
- Self-service machines, such as vending machines, ticket machines, ATMs and payment terminals.

The legislation operates with two deadlines for when websites must comply with the regulations:

- July 2014: All new websites are subject to the law. When the contract for design and development of the website is signed after July 1, 2014, the website is considered new ICT.
- January 2021: The regulations apply to all ICT solutions - both new and existing websites. Websites that do not undergo substantial changes in design and programming before 2021 are considered existing ICT until January 1, 2021, when all websites must comply.

The Norwegian Authority for Universal Design of ICT is an inspectorate responsible for supervising and administrating the regulations and uses an array of instruments and actions authorized by the legislation. The Authority is a part of the Agency for Public Management and eGovernment (Difi) in Norway. Through the website the Authority provides guidance on how to understand the legal

requirements and how to make ICT solutions universally designed in accordance with the law.

**Main solutions adopted at NTNU:**

No specific solutions are adopted, unless those required by law.

**d. Accessibility of study materials for students with sensorial impairments and students with specific learning disorders**

**National legislative framework** (main laws and implementation processes):

In the Norwegian Digital Agenda: ICT for a simpler everyday life and increased productivity, the government has stated that accessibility and Universal Design is considered a prerequisite for successful digitization. The Government's ICT policy has two main objectives:

- A user-centric and efficient public administration.
- Value creation and inclusion.

Norwegian Library of Talking Books and Braille (NLB) is a library for people and students with problems reading printed text. NLB works to ensure that everyone has equal access to literature and information. NLB is a state library under the Norwegian Ministry of Culture. The library offers a free, nation-wide service. NLB produces and lends out electronic and braille books to students who are blind, visually impaired and others with problems reading ordinary text. Many of NLB's borrowers have dyslexia, but there are also efficient for students with ADHD and Asperger syndrome. Books from NLB are free of charge. NLB's book collection consists of 19,000 talking book titles and 7,000 titles in braille. NLB produces around 1,100 new talking books and 400 titles in braille each year.

**Main solutions adopted at NTNU:**

The University Library NTNU offers audio versions or Braille versions of textbooks and study materials. The University Library can help students with sensorial impairment to convert text books/study materials into audio books at scanning stations.

Students whose disabilities make it physically difficult for them to write can get help with taking notes in classes. The helper - who is also a student - takes notes for such student. It's possible to make recordings of classes if professor has given permission beforehand.

#### **e. Methods and tools for monitoring accessibility**

##### **National legislative framework** (main laws and implementation processes):

According to Antidiscrimination and Accessibility Act (2009), all enterprises in Norway (including higher educational institutions) are required to implement Universal Design and provide reasonable adjustments to assure that students with special needs have equal access to higher education. HEIs are obligated to report about activities and progress in these matters to the Ministry of Education and Research.

In addition, this act is monitored by the Equality and anti-discrimination commission (LDO, [www.ldo.no](http://www.ldo.no)), and a student can without any costs address a complaint about discrimination to the commission. In case of a complaint, the LDO will collect information about the specific case, and make a statement about whether or not discrimination has taken place. The student can bring the case to the court of law if a HEI that has been found guilty of discrimination does not take remedial measures.

##### **Main solutions adopted at NTNU:**

The Norwegian Research Laboratory for Universal Design, NTNU in Gjøvik, was established in 2010. This laboratory has conducted various tests of the design criteria related to the aspects of accessibility. The laboratory offers facilities for studying our senses – such as hearing and vision, full-scale testing, workshops, rapid prototyping as well as traditional model building. The interdisciplinary research, moreover, brings forces from the department of health and social sciences, design/architecture, building construction technology, ICT/smart home technology, media technology, etc. together towards a common goal: a universally designed society.

#### **f. Training activities on accessibility issues**

##### **National legislative framework** (main laws and implementation processes):

The first national project focused on training and educational activities on Universal Design was organised by the Norwegian Building Research Institute and funded by the Norwegian State Housing Bank in 1997-2002. The aim of the project was to reinforce the integration of Universal Design into the courses offered by schools, colleges and universities, including relevant health education, technological and design education in Norway (e.g. architects, urban planners, designers, engineers, occupational therapists and managers of the building trades). The goal was to achieve that subjects relevant to Universal Design will be

included in the curriculum of the schools and universities by the end of 2001. This project has also contributed to making the term Universal Design widely known in Norway.

NTNU (Universell) as the National Coordinator of Accessibility in Higher Education in Norway organizes an annual conference for employees working with Universal Design and disability matters. The national coordinator established a working group (together with others HEIs in Norway) to raise awareness on disability and accessibility issues and to enhance HEI staff development. Since 2007, the national coordinator organizes two annual forum meetings between employees in higher education.

**Main solutions adopted at NTNU:**

NTNU in Trondheim participated in the first national project on Universal Design in 1997-2002, which was focused on implementation of the Universal Design courses into the curriculum of Norwegian universities:

- NTNU in Trondheim, School of Architecture: the course module on Universal Design was developed and implemented in curricula in 1999. The course has been made compulsory for second year students of architecture from the year 2000.
- NTNU in Trondheim, Faculty of Product Design: Universal Design was first introduced as a specialist subject (1999), but has later become an integrated part of the teaching (2000) of ergonomics, industrial design and product design at the NTNU.

NTNU in Gjøvik, School of Public Health

The first Nordic Master courses on Universal Design in Public Health (Occupational Therapy) started in 2006.

NTNU as the National Coordinator of Accessibility in Higher Education in Norway (Universell) has coordinated Erasmus+ Programme: Universal Design for Learning in Higher Education – License to Learn (UDLL) in 2014-2016. This project has investigated and challenged the role of the students, the teachers, the student support services and management and policy makers in implementing Universal Design in Higher Education. This project aimed to demonstrate how Universal Design for Learning (UDL) can be the best solution to develop an inclusive learning environment, and a higher quality of learning to benefit of all students. One of the project outputs is a publication: “Universal Design for Learning. Best Practice Guideline.”



## **2.8 Slovak University of Technology (Bratislava, Slovak)**

### **2.8.1. Description of a good accessibility solution:**

#### **Title: *Accessibility solutions at FA STU***

**Categories of accessibility:** accessibility of physical environment; training activities on accessibility issues.

At STU Bratislava there is a wide range of accessibility solutions, mostly referred to two categories: accessibility of physical environment and training activities on accessibility issues.

#### **1. Accessibility of physical environment at STU Bratislava**

FA STU's address is Namestie slobody 19, Bratislava, in the vicinity of the Government Office of the Slovak Republic. With its character and comprehensive solution, this building can be considered as one of the top works of the Slovak architect Emil Belluš. Its architectural and spatial concept, overall technical equipment, details and the range of materials used, as well as their high technical and craftsmanship, are great evidence to this.

Like many works of modernist architecture, this building is characterized by a monumental entrance with a stackable staircase and a dominant representative space of the entrance hall (with a height over two floors) which enters the right and left wing of the building through multi-level spaces in front of the main staircases.

##### **1.1. Methods and tools for monitoring accessibility**

The FA STU building was built between 1947 and 1950 and was refurbished in the 1980s. It has a rectangular ground plan, a double-tract layout, is five-storey with two underground floors. On the right wing of the building there are two lifts connecting all the floors of the building, however, in the left wing of the building there was a lift which ends on the second floor. From the point of view of ensuring accessibility, several major problems needed to be addressed. The first step was to carry out the accessibility monitoring conducted by CEDA FA STU.

The basic prerequisite for successful monitoring is a well-prepared access audit check-lists. The aim is that all spaces and facilities should be usable



independently by users with disabilities (as much as possible) since a well-designed environment reduces the need for assistance services. The assessment process was conducted in three phases: (1) Training the members of the Assessment Committee, (2) On-site survey and fill the Access Audit Check-lists, (3) Elaborating the Final Report and recommendations to remove barriers. Consultations with users and employees are useful methods of regularly reviewing and assessing how successfully their needs are being met and what their requirements for new projects or developments might be. Therefore, the Evaluation Committee was composed of different user groups: coordinator for students with specific needs, university investment manager, students with SN (with physical, visual and hearing impairments) and expert on Design for All.

The Final Report "*Report on the state of accessibility of spaces and services for students with specific needs at STU*", highlighted deficiencies in accessibility, together with detailed recommendations for modifications or improvements how best these could be overcome. When drawing up the Final Report, it was necessary to take into account several factors that affect movement, comfort and safety of all students. Final Report was divided into three parts:

1. Evaluation in terms of the independence, movement and use of buildings,
2. Evaluation in terms of way-finding system and access to information,
3. Assessment of safety and evacuation.

On the basis of the monitoring carried out, the FA STU identified the following major accessibility shortcomings:

- There are stairs before the main and side building entrances;
- The entrance hall is multi-level, it is necessary to overcome 6 steps on the way to lifts;
- The lift in the left wing of the building does not connect all the floors;
- There are 3 stairs before entering the main lecture hall / auditorium;
- There is no way-finding system for people with visual impairment;
- Evacuation of people with disabilities is not resolved.

Due to the fact that the FA STU building is a National Cultural Heritage building, it was recommended to choose such solutions that do not interfere with the heritage and aesthetic value of the building (according requirements of the Regional Cultural Heritage Office).

## **1.2. Main entrance to the building**

Complying with the Design for All principles, it is preferred to ensure accessibility to the building through the main entrance; the accessibility to the building through the side entrance can only be done in exceptional cases. In the case of FA STU, the solution to this problem was all the more complicated in that it was necessary to preserve the original appearance of the main entrance to the building. In front of the entrance, it was not possible to install a ramp or install a wheelchair Stair-lifts (1) because the stair landing in front of the entry door is not wide enough for safe manoeuvring of the person on the wheelchair and (2) is contrary to "Design for All" principles. The only suitable solution was to construct a lift in the entrance area. The new lift was built in a shaft, which was used to transport of coal into the boiler room in the past. However, the problem was the insufficient shaft dimension and it was therefore necessary to increase the lift shaft by means of the water jet cutting method, so as not to damage the statics of the entrance space and so as not to damage the original tiles on the facade. At present, there is a lift in the entrance area which has made accessible the entrance hall (with the reception) and the 1st underground floor, where there are common spaces and research laboratories. Through this underground floor there is accessible connection to the lifts in the left and right wing of the building by the new ramps.

## **1.3 Vertical and horizontal communications**

As mentioned above, the problem was inaccessible connection of the entrance hall to the lifts located in the left and right wing of the building. There was a need to overcome several height levels between the entrance hall and lifts. In order to preserve the heritage and aesthetic value of the entrance spaces, it was not possible and not acceptable for everyone to install stair-lifts in these areas (pillars as well as the entrance doors to the rooms along the staircase spaces are the obstacle). The ramps would be very long. The only possible solution was the accessible connection through the 1st underground floor (1st UF). The existing height differences in the underground floor were overcome by means of the ramp system. In this space the ramps do not act disturbingly, they are completing the interior character of the exhibition and social space (the original boiler-room), where students of architecture like to gather together and finish it according to their own ideas in the spirit of "industrial style". In the future, there is an idea of setting up a snack bar in this common space.

**Existing lifts** in the building did not meet accessibility requirements. The dimensions of the lift were inadequate and the lift equipment did not meet the standards of accessibility. The lift in the left wing of the building ended on the 2nd floor, so the lift was completely rebuilt. It was necessary to extend the lift shaft up to the 4th floor. In the right wing of the building, one lift shaft will be enlarged at the next stage in the place of the existing chimney which has not been used for a long time (due to the change to central heating). New lift construction has provided access to all the classrooms, including entrance to auditoriums in the left wing of the building. As the lift shaft is located near the foyer in front of the auditorium, the problem has been resolved by the fact that the new lift is passable and also stops on the auditorium level. In this level, there are reserved seats for the students in wheelchairs in the upper row of auditorium. Unfortunately, we have not yet been able to make accessible the lower level of the auditorium, where the stage for the lecturer is located. However, this problem can also be solved in the future and made available through the 1st underground floor.

At present, new lifts are equipped with the Design for All principles, e.g. the control panel is in accessible height also for people on the wheelchair, the buttons are marked with Braille and embossed letters, and there is an acoustic system announcing the lift position.

**Hallways** in the building are at the same time major evacuation routes, so individual fire segments needed to be separated by a fire-safety door. The original doors had a high door threshold and did not meet the increased standards for fire safety of buildings, so the doors needed to be replaced by their replicas with a higher fire resistance standard. For the same reasons, glazed walls with doors to specialized classrooms on the first floor were replaced by replicas. In order to exclude the existence of high door thresholds, magnetic / falling door thresholds were implemented. There was no need to modify the entrance doors into individual classrooms, since the doors were threshold-free and wide enough.

#### **1.4 STU Support Center**

In the FA STU building, the STU Counselling and Support Center was established, providing services to students with SN. The premises of the center are located near the study department on the ground floor and consist of two specialized classrooms, a consulting-technical room, a storage for compensatory aids and an accessible toilet.

**Specialized classrooms** are equipped with a sound amplification system (built-in induction loop) and other learning premises with a portable inductive loop. Classrooms are equipped with flexible seating and table furniture; students can choose chairs with or without armrests or chairs with folding table, classic and height-adjustable tables are available. Various furniture elements respect individual student demands and also allow for greater flexibility of spatial layout depending on the type of event.

In the consulting-technical room, a counselling center is set up which provides, in particular, individual counselling to students with specific needs (e.g. disabilities and health problems, psychological problems, learning difficulties, etc.). This room has a storage facility for the assistance and compensation aids that students can borrow. Equipment of the center includes aids for printing and production of learning and way-finding aids, such as print of embossed pictures, embossed labels, texts in Braille.

### **1.5 Way-finding in the building**

The layout of the building is clear and the way-finding in the building is not problematic for the students. The main stairs in the left and right wing of the building are well-recognizable in the entrance areas. In order to improve the way-finding of the students and the visitors of the University, a way-finding plan is arranged as embossed, while the descriptions of the departments and classrooms are embossed and Braille. The main classrooms and premises of the STU Counselling and Support Center have, alongside the entrance door, Braille labels indicating the purpose of the room.

### **1.6 Evacuation of students with specific needs**

The evacuation plans have been updated as part of the FA STU building accessibility adaptation project in accordance with the specific needs and capabilities of students. On the main escape stair landings and on the loggias (in case of fire), there are places reserved for students waiting for evacuation assistance. Evacuation chairs are located in both wings of the building and in the area of escape staircases. Students with SN receive special training (as well as responsible staff) to learn how to evacuate and who is responsible for organizing evacuation. Students with visual impairment have available the embossed evacuation plans of the building.

## **2. Training activities on accessibility issues/ Design for All/ Universal Design**

The FA STU in Bratislava has taught the subject of Universal Design (originally Barrier-Free Design) since 1995. The author of the idea of teaching universal design at the FA STU was Assoc. Prof. Maria Samova, who gained valuable experience at research fellowships at TU in Helsinki-Otaniemi, Finland (1985) and especially during a research program at the Adaptive Environment Center in Boston, USA (1994). At this institute, she gained basic knowledge of universal design and immediately after her return to Slovakia, she succeeded in implementing the subject "Universal Design" (UD) in the curriculum, which has been taught in the field of architecture and urbanism as a compulsory subject in Bachelor degree of study up to the present day.

In 2008, the Research and Training Center "**CEDA - Center for Design for All**" was established at the Faculty of Architecture, specializing in the creation of an inclusive environment, reflecting the latest research findings in Universal Design/Design for All/Inclusive Design. The CEDA members apply the results of research to the teaching process not only within the subject of the UD but also in other subjects such as the Typology of Residential and Public Building or Atelier Studio. They also provide education for the general public in lifelong learning. They have published several publications and textbooks that focus on the design of various types of buildings in accordance with the principles of Design for All. They also collaborate on the building legislation and participate in the creation of government programs related to the implementation of provisions of the ratified CRPD in Slovakia. Moreover, they provide consultancy or cooperate on the project documentation of buildings in accordance with the Design for All principles.

### **2.1. Universal Design subject teaching**

The aim of the UD subject is to teach students of architecture and urbanism to build buildings and public spaces that take into account the diversity of future users and emphasize the quality of the user environment. The methodology of teaching the UD subject is based on the results of the research, but also on the specifics of the social environment of the Slovak Republic. To date, it is necessary to combat prejudices and limited knowledge of the claims and abilities of people with disabilities. Therefore, one of the priorities of the UD subject is to draw students' attention to the demands of different users among others disabled people and seniors, and to form social feelings and positive students' attitudes towards inclusion and active aging. As a part of the teaching, there are various



sensitization exercises, discussions with various groups of users, including people with disabilities, presenting students their willingness and ability to succeed in the labor market, research or Paralympic sport. The aim is to convince our students that accessibility of environment, products, services and information is a very important tool in the process of social inclusion and participation of persons with disabilities in society and also to explain that the creation of an accessible environment needs to be seen in several contexts: (1) as a human rights principle under the CRPD, (2) in the context of a socially sustainable society, in accordance with the principles of inclusion and participation of discriminated population groups, (3) in the context of an economically sustainable society, by means of measures that will allow persons with disabilities an access to economic opportunities.

Another important part of the UD subject is teaching the typological principles of creating accessible buildings and public spaces as well as the provisions of building legislation. Architectural design is in practice closely linked with typology and building legislation and the basic rule is that - what is not stipulated in legislation, is not performed in building practice, if so, it is performed very rarely. Although the legislative rules restrict and hinder the architect's "creative breakthrough," in the society awareness at the present time, they are the only tool to reach at least a satisfactory state of accessibility.

Students are also actively engaged in the current research process related to Universal Design / Design for All. In solving practical assignments, students are drawn to real situations that occur during the preparation and creation of project documentation of buildings. The aim of the methodology of research-related teaching is the application of the Universal Design / Design for All principles on every stage of the design process - from urban and landscape planning to the creation of architectural concepts and projects of a building. A fundamental role in designing is the requirement for participatory planning. These teaching methodology is based on the UDL-Universal Design for Learning principles, by using multiple means of representation, expression and the active engagement of students, including active acquisition of knowledge by "learning by doing".

The basic prerequisite for the successful mastering of the subject of the UD is the preparation of the **semester project (SP)**. Students can choose the SP under the UDL principles according to their own preferences and individual abilities. The outputs of SP are creative works which are interesting for students, they are often very innovative, imaginative and humorous. SP can be elaborated individually or

in a team, can be handwritten with graphics using sketches, graphic software, or as a video-document.

Examples of SP assignments:

- **Philosophical and ethic topics** - the aim is to express humanistic message of the UD/ DfA, mediation of life stories and experiences of users, create interesting videos or posters to sensitize the public, etc.
- **Practical topics** – the aim is to carry out on-site surveys, post-occupancy evaluation or access audits of the built environment, to make proposals for improving this environment, and to express progressive visions, etc.

The results of the SP work can be presented by students according to the UDL method in a variety of forms of their choice - in writing, by power-point presentation, by poster, or by screening of the film followed by a discussion.

### **Why the solutions can be considered innovative**

In order to increase the access of students with specific needs (SN) to study at the Slovak University of Technology (STU) in Bratislava and to fulfil the provisions of the Higher Education Act, two development projects were implemented by the Centre of Design for All (CEDA FA STU) at STU:

1. Pilot Project: "Creating learning conditions for students with SN at the Slovak University of Technology in Bratislava" - the objective of the project was to perform a monitoring of the accessibility of all STU buildings and to elaborate a methodology of the monitoring physical barriers in a higher education environment that would be applicable to all Slovak universities.

2. Pilot Project: "Elimination of architectural, informational and way-finding barriers at the Slovak University of Technology" - the aim of the project was to implement investment plans related to the provision of accessibility for the faculty buildings and student dormitories of STU according to the principles of Universal Design/Design for All.

Based on the implementation of these development projects, the conditions for students with specific needs were improved in the following areas:

- creating an accessible university environment of seven STU faculties and STU Rector's Office building;
- providing accommodation in accessible environment of the student dormitory STU;



- improving access to information and learning material in STU's academic (faculty) libraries in accessible form and increased the information on study for students with SN;
- improving conditions for way-finding, independent and safe movement of students with sensory impairments at the premises of STU faculties, and creating evacuation plans for students with disabilities for potential health and life-hazardous situations;
- improving availability of support services for students with specific needs; the STU Support Centre for Students with SN, which is also a training and consulting centre, was created in accordance with this objective - the STU Support Centre provides training for the creation of an inclusive educational environment through the Universal Design /Design for All method in the light of the UN Convention on the Rights of Persons with Disabilities (CRPD).

In this case study, the accessibility adaptations of the Faculty of Architecture STU are described in more detail. This building was chosen due to the fact that the building of the STU Faculty of Architecture (FA STU) is the Slovak National Cultural Heritage building, and in the case of its conversion into accessible environment, it was necessary to take into account the requirements of the Regional Cultural Heritage Office. The STU Support Centre for Students with Specific Needs was also set up at this building.



## 2.8.2. Accessibility framework at the STU

### Short description of the University and its locations

Slovak University of Technology in Bratislava (STU) is a modern research and education institution. It follows the 250-year-long history of Mining Academy in Banska Stiavnica, where the foundations of education connected to practice were laid. STU offers technical education and research in mechanical and civil engineering, computer science, architecture, chemistry, food and material technology.

According to the world ranking, STU is the best technical university in Slovakia and, according to the European Research Ranking - ranking of European institutions in the success of research projects, STU has the best score in Slovakia. Annually, approximately 13,000 students study both at seven faculties and at the STU Management Institute. The university provides three levels of study: Bachelor, Master (Ing.) / Master (Mgr.) and Doctoral study programs. STU also offers lifelong learning programs and MBA studies in collaboration with TU Wien.

- Total students: 13 228 (October, 2016)
- Total employees: 2560 (September, 2017)
- Total students with disabilities: 59 registered students with specific needs at STU (October 2017):
  - 1 student with visual impairment,
  - 4 students with hearing impairment,
  - 4 students with physical disabilities,
  - 27 students with learning disabilities or autism,
  - 23 students with chronic / mental illness or health impairment.

### Short description of the main design solutions related to environments and services to facilitate the study to students with special needs

#### a. Accessibility of physical environment

**National legislative framework** (main laws and implementation processes):

The basic documents defining the roles and measures to ensure progress in the protection of the rights of persons with disabilities in Slovakia are:



- The UN Convention on the Rights of Persons with Disabilities (UNCRPD) and the "National Program for the Development of Living Conditions for Persons with Disabilities 2014-2020" which define basic tasks related to, for example, the accessibility of the environment and education for people with disabilities.
- Document of the Government of the Slovak Republic - Program Declaration of the Government of the Slovak Republic for the years 2016 - 2020, in which the Government undertakes to take measures to support higher education of students with specific needs (SN) and the establishment and development of support centres for students with SN.
- Decree of the Ministry of the Environment on Building Act No. 532/2002 Coll. laying down the details on general technical requirements for construction and on general technical requirements for buildings used by persons with reduced mobility and orientation. Part IV. of the Decree sets out basic requirements for the creation of an accessible environment. Under the provision, all buildings intended for use by the public, including school buildings and students' dormitories, must be accessible. Performance of the provisions is assessed in the construction procedure. The details and requirements for the accessible solutions of the premises are set out in the annex to the Decree.

#### **Main solutions adopted at STU:**

At the Faculty of Architecture STU, the Centre of Design for All (CEDA FA STU) was set up in 2008, dedicated to research, education and consulting in the field of inclusive environment and products in accordance with the Design for All / Universal Design principles. The Centre is a member of the international organization "EIDD - Design for All Europe".

The accessibility provisions of the building legislation were implemented in the construction of new STU buildings as well as in the new research laboratories. The existing buildings were continually made accessible to meet the requirements of building legislation in the area of physical accessibility.

Nowadays, there are accessible classroom premises at all STU faculties. The physical environment of existing buildings, including the listed buildings, has been made available through two development projects:

1. Creating the conditions for study for students with specific needs at the Slovak University of Technology in Bratislava (2013)



- The aim of the project was to identify architectural and way-finding barriers in all buildings of faculties and student dormitories. Identification was through accessibility surveys. At the same time, recommendations were developed for making of the objects accessible for all students.

2. Elimination of architectural, orientation and information barriers at the Slovak University of Technology in Bratislava (2015-2017)

- The goal of the project was to remove existing barriers. In the form of investment projects, the architectural barriers in the buildings of Rector's office, 6 faculties and 1 student dormitory were removed.

#### **b. Accessibility and availability of the support services for students with SEN\_ *Special Education Needs***

**National legislative framework** (main laws and implementation processes):

- Government Document of Slovak Republic - Long-term Plan for Education, Research, Development and Other Creative Activities for the University Education for 2016 - 2021, which provides for one of the basic priorities for the coming years to ensure accessible and diverse higher education, underlining the need to promote active policies to remove barriers to access to higher education and developments towards the diversity of the system. It is very important to create conditions for students according to their needs (flexible organization of study, study methods allowing students to study in time according to the student's possibilities, availability of support services, etc.), emphasizing the need for barrier-free process and universal accessibility.
- Act No. 131/2002 Coll. on Higher Education Institutions (Higher Education Act) - Higher Education Institutions are obliged to create, as specified in the Higher Education Act (Article 100, paragraph 1), since 1 January 2013 "A universally accessible academic environment by also creation of appropriate learning conditions for students with specific needs (SN) without decreasing the requirements for their study performance".

Students with SN are entitled to support services, such as specific learning resources and individual learning approaches (Section 100, paragraph 4), under the Higher Education Act. To provide adequate support for the study of students with SN, coordinators or support centres (Section 100, paragraph 7) operate at higher education institutions. The role of methodological, knowledge and coordination centres with national competence is fulfilled under the Act on Higher

Education by Specialized Teaching Centres set up at the Comenius University in Bratislava and the Technical University in Kosice (Section 100, paragraph 8). The Act on Higher Education also stipulates that, in order to financially ensure the appropriate conditions for the study of students with SN, the public higher education institution creates a financial fund to support the study of students with SN. More significant systematic financial support from Ministry of Education, Science, Research and Sports of the Slovak Republic started to be provided in 2015 in the form of a grant to provide support services to students with SN. The individual types of specific student needs are grouped and for each group a grant amount is determined. The university is provided with funds depending on the number of students with SN in the group registered in the Central Student Register. The use of funds is bound to provision of support services to students with SN.

- Decree of the Ministry of Education, Science, Research and Sports of the Slovak Republic No. 458/2012 Coll. on minimum requirements of a student with specific needs. This Decree sets out minimum spatial and material requirements and other claims related to the study of students with disabilities, however, the Decree does not provide a more detailed overview of the requirements of particular groups of students with SN.

#### **Main solutions adopted at STU:**

- **Rector's Directive No. 5/2013-SR:** Coordinator for Students with Specific Needs at the Slovak University of Technology in Bratislava: The Directive stipulates uniform principles for the creation of personal, material, organizational and other prerequisites for the creation of a universally accessible academic environment and corresponding study conditions for STU students and applicants with SN, without reducing the requirements for their study performance and in accordance with the principles equal treatment. Main tasks and competences of the coordinator:
  - (a) actively participates in identifying student applicants with SN,
  - (b) assesses the specific needs of applicants and students, recommends a range of relevant support services and participates in their support,
  - (c) ensures cooperation with STU staff, university workplaces and STU facilities,
  - (d) provides guidance to students in the provision of support services and coordinates these services for them,

- (e) makes an annual proposal to use funds to support students' learning, in particular to provide material and technical aids.
  
- **Rector's directive No. 3/2017-SR** Rules for the allocation of accommodation to students in STU accommodation facilities: Pursuant to this Directive, accommodation in the accessible premises of the student dormitory is preferably provided to students with physical disabilities of lower limb, if the place of residence of such a student is more than 20 km from the place of study.

Since 2018, the STU has established a Counselling and Support Centre for students with specific needs. At the same time, the ambition is to act as a nationwide educational centre in the field of physical / architectural accessibility of the university environment.

### **c. Information and communication accessibility**

**National legislative framework** (main laws and implementation processes):

- **Act No. 275/2006 Coll. on Information Systems of Public Administration**, stipulates mandatory requirements for accessibility of websites.
- **Act No. 211/2000 Coll. on Free Access to Information**, empowers persons with sensory disabilities to request public institutions to provide information in accessible formats. Communicating with each other and communicating with hearing persons is guaranteed to the deaf people through the interpreter in the sign language also by Act No. 149/1995 Coll. on the Sign Language for Deaf People and Act No. 448/2008 Coll. on Social Services.

#### **Main solutions adopted at STU:**

Information and communication barriers are gradually eliminated at the STU due to the development project "Elimination of Architectural, Orientation and Information Barriers at the Slovak University of Technology in Bratislava", which was implemented in the years 2015-2017.

The accessibility of the STU website as well as the accessibility of the Academic Information System has been tested as part of the "*UNIALL - Accessibility of Higher Education for Students with Special Needs*" (Erasmus + Program, KA2 Strategic Partnerships in Higher Education) project.



At present, the accessibility of the University's Web sites is being gradually implemented, but so far, the Academic Information System has not been made accessible to students with visual impairments as it is bound by a contract with the system's creator. At present, the STU is working with the system's creator to provide a new system which will also be accessible to these students.

#### **d. Accessibility of study materials for students with sensorial impairments and students with specific learning disorders**

**National legislative framework** (main laws and implementation processes):

- Decree No. **458/2012 Coll. on minimum requirements of a student with specific needs**, sets out the minimum spatial and material requirements and other claims related to the education of students with disabilities and difficulties. The Decree sets out requirements for the provision of accessible physical environment and of materials for studying in accessible form for students with sensory disabilities and students with learning disabilities – e.g. preparation of lectures and exercise assignments documents.

**Main solutions adopted at STU:**

At present, faculty coordinators provide help with the provision of learning materials, and from 2018 this activity will also be carried out by the STU Counselling and Support Centre, which gradually provides technical equipment for embossed printing and digitization of learning materials.

#### **e. Methods and tools for monitoring accessibility**

**National legislative framework** (main laws and implementation processes):

There are no guidelines on accessibility monitoring in Slovak legislation. However, Systems for monitoring accessibility of academic environment created by specialized staff are used in practice:

1. Monitoring on physical accessibility in the university environment was created and carried out by the Centre for Design for All (CEDA), Faculty of Architecture STU in Bratislava. Slovak universities can carry out monitoring in cooperation with this centre, two publications which serve as a manual have been published.

2. Monitoring on information accessibility was created and carried out by the Centre for Support of Students with SN, Faculty of Mathematics, Physics and Computer Science, University of Comenius in Bratislava.

The objective of accessibility assessments is to identify existing barriers and develop recommendations for the removal of architectural, information and orientation barriers so that all users / students can move in the university environment in the future without the need for the assistance of other person (according to individual capabilities).

**Main solutions adopted at STU:**

Physical accessibility of the STU environment was monitored within the framework of the development project "*Creating the conditions for study for students with specific needs at the Slovak Technical University in Bratislava*". For the purpose of assessing physical accessibility, assessment check-lists were created to monitor the accessibility of all faculties and student dormitories of STU, as well as the spatial orientation ability of students with visual impairment in these buildings. The output of the project was the assessment report prepared separately for each faculty, as well as for all student dormitories. At the end of the assessment reports, recommendations were issued for the gradual removal of architectural and orientation barriers.

**f. Training activities on accessibility issues**

**National legislative framework** (main laws and implementation processes):

According to Higher Education Act (§ 100, paragraph 8), two special pedagogical workplaces are set up in Slovakia to support teaching students with SN. The workplaces fulfil the role of methodological, knowledge and coordination centres and are set up at:

- a) Comenius University in Bratislava,
- b) Technical University of Kosice.

These centres have been carrying out training and consultation activities for coordinators for students with SN since 2010.

From 2018, the Centre for Students with SN at the Slovak Technical University in Bratislava will be in operation. It will provide training and consulting activities in the field of monitoring and removing architectural and way-finding barriers at universities.

Currently, the national document: "*National Action Plan for Creating an Accessible Academic Environment and Corresponding Conditions of Learning of Students with Specific Needs*" is in approval process. The action plan has one of its objectives - to take steps to improve the training, education and financial reward of experts in the field of assistance technologies and support services.



**Main solutions adopted at STU:**

STU in Bratislava, under the guidance of the University Coordinator for Students with SN, regularly organizes trainings for the coordinators of all STU faculties. The training is focused on the application of the legislation and the STU Directive in this area, especially in relation to assessing the specific needs of students and providing support services and assistance technologies.

The Centre for Design for All - CEDA FA STU has been providing the public nationwide with accredited education and guidance on the creation of an inclusive environment and products since 2008. As part of the training of future architects and urban planners, CEDA staff members have been teaching the compulsory subject " Universal Design " at the Faculty of Architecture at STU since 1995.



## 2.9 Mid Sweden University (Sundsvall, Sweden)

### 2.9.1. Description of a good accessibility solution:

**Title:** *Accessibility solutions at Mid Sweden University*

**Categories of accessibility:** accessibility of physical environment; methods and tools for monitoring accessibility; training activities on accessibility issues.

#### 1. Accessibility of physical environment at Mid Sweden University in Sundsvall

The campus of Mid Sweden University in Sundsvall is situated near the city centre. The heart of the campus “Åkroken” was rebuilt in 1997. Swedish architectural studio Arken won the design competition with the project based on the concept “university as a town” with traditional patterns of alleys and squares, bridges and landing-stages (Fig. 1). The studio Arken has won two International Awards for this project – in 2008 the Belgian Prix Rotthier for Best New Campus and in 2005 the American CNU Charter Award, which is one of the world’s most prestigious urban planning prizes.

The historic buildings were incorporated into the new layout with new buildings, which also follow the tradition of old warehouses (Fig. 2a,b). The main building “Mälthuset” consist of the library, restaurant, reception, and “Fälldinsalen”- the largest lecture hall on campus. All buildings are fully accessible, including the historic buildings that were adapted to provide equal access to all students and employees of Mid Sweden University.

The layout of the campus is easily readable, providing simple and intuitive use and orientation, in accordance with the seven principles of Universal Design. The entrances to the buildings are accessible at the same level with pathways, without any obstacles. Covered glass spaces between buildings serve as circulation and socializing areas with lifts, bridges, seating and relaxing places (Fig. 3a). The library and learning spaces, including auditoriums, are fully accessible for users in a wheelchair.

Building of the Department of Industrial Design, Mid Sweden University in Sundsvall is an example of the new building in university campus, which follows the tradition of old warehouses (Fig. 3b). This building is universally accessible for all students, as well as connection with old building is accessible by the lift platform situated at the stairs (Fig. 4b).

Navigation and wayfinding within the building is very good also for people with visual impairments, because of the tactile paving, which leads from the entrance door to the circulation areas (lifts and stairs). Moreover, the colour contrast (combination of red, white and grey colours) of the walls, floors and doors provides easy orientation for people with low vision. The concept of the “space visibility” is also evident thanks to the transparent glass walls, which help people with hearing impairments to predict what is happening in the space, but also this solution provides the natural light in corridors. The furniture reflects the user diversity, as there are adjustable height levels of the tables in classrooms.

## **2. Methods and tools for monitoring/testing accessibility**

The Design Research Lab at Mid Sweden University in Sundsvall provides educational and research activities focused on design for inclusion – Design for All. The Lab is located in the Building of Department of Industrial Design. The aim of the Lab is to conduct research and testing on how different design solutions can affect various users, including people with disabilities.

The Lab consists of two parts: (1) User stage, and (2) Control room with several measurement tools. The User stage is a cubic room, which serves for evaluation of design concepts with users in virtual space. Three walls of the room serve as projection walls for three video-projectors. Visual data can be combined with audio and smell stimulus to create virtual reality and simulate different design situations. This space is also used for video recording of user’s behaviour responding to virtual environment. The Control room serves for arranging and controlling visual performances, as well as for data collecting and analysing.

The Lab uses a variety of tools and methods to monitor and measure user’s behaviour, especially new tools for physiological measurement of neural (emotional and cognitive) responses. These tools include, for example: galvanic skin response (GSR), electrocardiograph (ECG), and electroencephalograph (EEG). These tools measure brain activity, heart rate and hand sweat of the users showing their emotional reactions to different stimuli. The measurements and analyses of physiological values are combining with other methods of observations, interviews and questionnaires to obtain complex data for design process.

## **3. Training activities on accessibility issues / Design for All/ Universal Design**

The international Master’s Programme in Industrial Design - Design for All was established by Professor Lena Lorentzen at the Department of Industrial Design, Mid Sweden University in Sundsvall, in 2010. This programme is closely

connected with the abovementioned multidisciplinary research activities of the Design Research Lab.

The programme is focused on the development of humanistic and sustainable design solutions by the innovative methods, which take the human diversity into account throughout the design process. Design for All perspective is taken into consideration when creating products, environments, systems and services.

The programme consists of the following courses:

- User-Centred Design - focused on the solutions for human well-being by analysing the needs of the user groups, their mental and physical reactions to different design solutions;
- Sustainable Design – emphasising the long-term environmental, social and economic impact of design solutions;
- Creativity and Problem-Solving Methodologies – applying the methods to understand the problem and find the relevant design solutions;
- Aesthetics;
- Research Process;
- Project I and II;
- Form and Light;
- Multidisciplinary and International orientation;
- Master Thesis

### **Why the solution can be considered innovative**

Mid Sweden University is working for equal opportunities of all people, as stated in institutional document: “The equality of all human beings is an obvious and basic value in all activities at Mid Sweden University.” Therefore, university is a good example of inclusive practise in higher education, covering also universal accessibility of physical environment and training activities related to design for inclusion.

The campus of Mid Sweden University in Sundsvall is fully accessible, including the historic buildings that were adapted to provide equal access to all students and employees of Mid Sweden University. The Design Research Lab at Mid Sweden University in Sundsvall provides also educational and research activities focused on design for inclusion – Design for All. The Lab is a member of the European Institute for Design and Disability (EIDD) – Design for All Europe.



## 2.9.2. Accessibility framework at the Mid Sweden University

### Short description of the University and its locations

The history of Mid Sweden University dates back to 1842 when the teacher's and nautical education started in Härnösand. Later, the University College of Sundsvall/ Härnösand and the University College of Östersund were founded in 1977. These two university colleges were merged and became a full status university in 1993.

Mid Sweden University offers a wide variety of study programmes and courses, as well as research activities. Mid Sweden University is located in the middle of Sweden and consist of two campuses: Sundsvall and Östersund. The main educational focus at Campus Sundsvall lies within the Natural Sciences, Technology, and Media, but it is also possible to study within the areas of Social Sciences and Health Sciences. The study programmes at Campus Östersund are focused on the Social Sciences, Natural Sciences and Technology. Courses are also offered within the Health Sciences and Social Work.

Campus Sundsvall is situated near the city centre. The concept of the campus was to create "school as a town". The heart of campus "Åkroken" is built as a small town within the city, with historical patterns of alleys and squares, bridges and landing-stages. The old buildings were incorporated into the new layout. The new buildings also follow the local tradition of the old regional warehouses. In 2005, "Åkroken" won the Charter Award, which is one of the world's most prestigious town architecture prizes. The high round house "Mälthuset" consist of the library, restaurant, reception, and "Fälldinsalen"- the largest lecture hall on campus.

#### **Statistic data:**

- Total students: 13598 students from Sweden and 441 international students (in the academic year 2015/2016)
- Total employees: 1026 employees at Mid Sweden University in 2016
- Total number of students with special educational needs (SEN): approx. 340 (2,4 %) students with SEN (mostly students with Dyslexia)

Institutional documents related to accessibility:

- EQUAL OPPORTUNITIES ACTION PLAN 2014-2016, Reg. No. MIUN 2014/879: "Mid Sweden University should be a seat of learning and a work place free from discrimination and harassment and where differences are

made full use of to both support the individual's possibilities to work or study and to develop the activities of the university".

- WORK FOR EQUAL OPPORTUNITIES. The purpose of this document is to spread knowledge about the meaning of discrimination, harassment and victimization, and about our preventive efforts.
- STRATEGI FÖR VERKSAMHETENS FÖRUTSÄTTNINGAR. Reg. No. MIUN 2012/1612

In Sweden, the national goals of the accessibility policy are diversity, full participation and equal opportunities for all people. One of the government initiatives was an action plan: "From Patient to Citizen – a national action plan for disability policy", which was adopted in 2000.

The Swedish Government ratified the UN Convention on the Rights of Persons with Disabilities (UNCRPD) in 2008, which is legally binding. Therefore, Sweden has committed to ensuring that national legislation does not discriminate against people with disabilities. The Swedish Government and Parliament establish guidelines for disability policies, mainly through legislation. Government agencies have a national responsibility for specific sectors, including education, health care and employment. Their task is to accelerate the pace of development in their particular sectors and ensure compliance with policy.

According to UNCRPD, the new Non-Discrimination Act (SFS 2008:567) came into force on 1 January 2009 and replaced many of the previous laws regulated discrimination. In June 2014, parliament approved a new provision that considers an inadequate accessibility as a form of discrimination. In January 2015, the new law point in this act was added, which classifies inadequate accessibility in all types of school as discrimination. The provisions include both pedagogical availability and physical accessibility.

## **Short description of the main design solutions related to environments and services to facilitate the study to students with special needs**

### **a. Accessibility of physical environment**

**National legislative framework** (main laws and implementation processes):

According to Swedish legislation, buildings must be accessible and usable for people with impaired mobility and orientation. Sites intended for development

must be accessible and usable if this is reasonable with reference to the terrain and conditions in general.

- Ordinance 2001:526: gives the responsibility to government institutions (including those at regional, county and municipal level) to work toward a higher level of accessibility than mandated in the Building Act and other similar legislation. Each government institution is obliged to adopt the Action plan for accessibility and to report regularly about the implementation of this plan.
- The Swedish Agency for Participation (MFD): provides accessibility guidelines to assist all relevant government institutions to fulfil their responsibilities concerning accessibility. These guidelines are a basis for determining reasonable accommodations to ensure equal accessibility.
- The Planning and Building Act (PBA) and the Planning and Building Ordinance (PBO): a general requirement for accessibility and usability for people with impaired mobility or orientation capacity is given in Chapter 8 of the Planning and Building Act (2010:900), and in Chapter 3 of the Planning and Building Ordinance (2011:338).
- The National Board of Housing, Building and Planning (Boverket): publishes Building Regulations (BBR) which include mandatory provisions concerning accessibility. The Building Regulations (BBR) apply for a new building and for an alteration, including altered use. Most of the regulations concerning accessibility are found in section 3, and also in section 8.

**Main solutions adopted at Mid Sweden University:**

The university provides equal opportunities and inclusive educational environment in accordance with the institutional document *WORK FOR EQUAL OPPORTUNITIES*: “The equality of all human beings is an obvious and basic value in all activities at Mid Sweden University. Both students and employees should be treated and met with respect and dignity and differences should be respected in order to make the most of the individual's opportunities in terms of studies and work.”

The campus in Sundsvall is fully accessible, including the historic buildings that were adapted to provide equal access to all students and employees of Mid Sweden University.

The university provides also educational and research activities focused on inclusive design – Design for All. The Design Research Lab at Mid Sweden University in Sundsvall is a member of the European Institute for Design and

Disability (EIDD) – Design for All Europe. The Lab is located in the Department of Industrial Design and consists of two parts: one user stage and one control room with several measurement tools. The aim of the Lab is to conduct research on how different design solutions can affect various users, including people with disabilities.

**b. Accessibility and availability of the support services for students with SEN\_ *Special Education Needs***

**National legislative framework** (main laws and implementation processes):

In Sweden, there is no legal definition of special educational needs (SEN). Education follows the principle of “school for all” and the focus is on what kind of support the student actually needs. This means that students in need of special support should not be treated or defined as a group that is any different from other students and their rights are not stated separately. This is the basic principle of an inclusive education system.

- The Education Act (Skollagen SFS 2010:800): ensures that the state provides education for all young people at all levels. Chapter 3 of the Education Act states that all pupils are to be given guidance, encouragement and appropriate support based on their specific capabilities to ensure that they attain their personal and educational development and goals.

According to the Equal Treatment of Students at Universities Act, no student at university or other institution of higher education (HE) in Sweden should be discriminated.

- The Swedish Higher Education Act (Act on Amendment of the Higher Education Act 2013:1117) and associated Higher Education Ordinance (Högskoleförordningen) Section 5 of the Act: promotes ideas of sustainable development, equality, justice and welfare: “Higher Education institutions shall promote sustainable development to assure for present and future generations a sound and healthy environment, economic and social welfare, and justice.”

The Swedish Council for Higher Education is the agency responsible for the operation and governance of HE institutions, with responsibilities that cover: admissions to HE, the production of tests, provision of support and information for prospective students, widening participation and preventing discrimination in HE, the evaluation of foreign education qualifications, and the management and development of IT systems.



All universities and institutions of higher education in Sweden are required to have one contact person (co-ordinator) for students with disabilities. The co-ordinator is working with issues relating to educational support for these students and is also involved in the work with action plans and strategies for the development of accessibility and equal opportunities.

Since 1993, Stockholm University has been assigned as the National coordinator for accessibility of HE with the task to annually collect information and to describe in the annual report the developments, initiatives and activities that have improved the level of accessibility of HE. The National Agency for Special Needs Education (SPSM) covers some costs at universities for services in the area of personal support to students with mobility difficulties and mentor support for students with cognitive difficulties due to for example ADHD and Asperger's syndrome.

**Main solutions adopted at Mid Sweden University:**

Mid Sweden University offers special support to students that may be granted in consultation with the coordinator for students with disabilities. The basic support services offered by the university are as follows:

- Help with taking notes
- Adjusted course literature (e.g. talking books and books in Braille)
- Mentor support
- Resource room, a room with special equipment and resources
- Technical/pedagogic help equipment
- Sign language interpreter/note taker
- Special arrangements in the context of an examination (extended time for exams, alternative exams)
- Adjustment of rooms

**c. Information and communication accessibility**

**National legislative framework** (main laws and implementation processes):

Sweden has guidelines on internet accessibility, "Guidance for Web Development", produced by the e-Government Delegation. The guidelines are intended for official bodies and contain a wide range of general recommendations for the development of websites based on Web Content Accessibility Guidelines WCAG 2.0, level AA. By following these recommendations, designers can develop web pages that are more accessible to persons with a variety of disabilities.

The Swedish Agency for Participation (MFD) publishes accessibility guidelines that include information and communication technology (ICT). The guidelines for ICT covers the international standard on web-accessibility and the European standard EN 301 549 with accessibility requirements to be used in procurement of ICT.

**Main solutions adopted at Mid Sweden University:**

Mid Sweden University has added the ReadSpeaker listen function to their website in order to provide their users with the option to have their online documents read out loud. Bengt Nilsson, Web Coordinator of Mid Sweden University, stated: "We wanted to implement a listen function for our online text and documents to make our website accessible even to visitors who find it difficult to read. Accessibility is important for our site.

**d. Accessibility of study materials for students with sensorial impairments and students with specific learning disorders**

**National legislative framework** (main laws and implementation processes):

The Swedish Agency for Accessible Media (MTM) serves as a library of talking books and Braille books to ensure that all persons with reading impairments (e.g. visual impairment, dyslexia, ADHD) can access literature through media appropriate to them. This library also provides access to required study materials and produces course literature in alternative formats for university students. Students can download talking books themselves from the Legimus directory.

**Main solutions adopted at Mid Sweden University:**

The University Library in Sundsvall offers to students the possibility to download and produce Daisy-discs (talking books). The library also orders course literature that is not yet produced by the Swedish Agency for Accessible Media (MTM).

The Reading resource rooms at the library are available for students with limitations to read or print. The computers in the rooms are equipped with special software and programs designed to help students to read and write, e.g.:

- ABBYY FineReader (creates searchable and editable electronic files from scanned documents, PDF files and digital photographs)
- Dolphin EasyProducer (produces speech synthesized Daisy books from a text and converts Word documents into a structured Daisy books)
- Zoomtext (magnification program with magnification from 1.25 to 36 times, including texts read with speech synthesis).



## **e. Methods and tools for monitoring accessibility**

### **National legislative framework** (main laws and implementation processes):

- The Swedish Agency for Participation (MFD) is monitoring how government institutions are progressing in their efforts to improve accessibility (physical, sensory, ICT...) in accordance with the Ordinance 2001:526. MFD works according to the principle that everyone has the right to full participation in society, regardless of functional capacity. The main activities of MFD are as follows:
  - monitoring and analysing developments;
  - proposing methods, guidelines and guidance;
  - disseminating knowledge;
  - initiating research and other development work;
  - providing support and proposing measures to government.

MFD also produces various checklist protocols as an evaluation tool to assess the accessibility of the built environment in accordance with the Swedish legal framework. The checklist protocol consists of various question themes focused on general information about the object and the physical accessibility requirements, but also visual, acoustic, climatic (anti-allergic) accessibility and emergency and evacuation precautions.

- The National Board of Housing, Building and Planning drafts the regulations that define the functioning of the control system for accessibility assessment, as well as the requirements that apply for certification as an expert in accessibility. The certification of experts in accessibility is managed by the company Kiwa Swedcert.

### **Main solutions adopted at Mid Sweden University:**

Activities are developed according to the national laws.

## **f. Training activities on accessibility issues**

### **National legislative framework** (main laws and implementation processes):

The training activities on accessibility of the built environment are mainly provided by The Swedish Agency for Participation (MFD).

Since 1993, Stockholm University has been assigned as the National coordinator for accessibility of HE. The national network for cooperation between the co-ordinators for students with disabilities in HE institutions was created in 1993. This network serves as a forum for experience exchange and



education/training, as well as holds conferences every year for the co-ordinators. In 1999, four regional networks were formed to provide more regional training activities. A special training day is held every two years for new coordinators to introduce them into the field of work.

Courses on Design for All (DfA) are widespread at Swedish design/architecture schools, for example at Lund University at the Department of Design Science the courses started in 2003; at Luleå University the courses were established in 2007. The first international Master's Programme in Design for All was established at Mid Sweden University in Sundsvall in 2010.

**Main solutions adopted at Mid Sweden University:**

In 2010, the international Master's Programme in Design for All was established at Mid Sweden University in Sundsvall. This programme is focused on development of humanistic and sustainable design solutions by the methods, which take human diversity into account throughout the design process. The programme consists of the following courses:

- User-Centred Design (solutions for human well-being)
- Sustainable Design (long-term environmental, social and economic impact of design solutions)
- Creativity and Problem-Solving Methodologies
- Aesthetics
- Form and Light
- Multidisciplinary orientation



### **3. EVALUATION OF DATA AND FINAL CONSIDERATIONS**

The data concerning the universities were collected using two forms (Annex 1 and Annex 2), with a broad indication of expected contents for each field.

On the other hand, interpretative freedom was also given to the referents of each University who provided to fill the forms, because from the beginning it became clear that there is a wide variation, from country to country and from university to university, in the legislative framework, the social and cultural contexts in which the universities are located and therefore the "good" solutions adopted by each of them to promote access to higher education for students with special needs.

As a result, significant differences emerge between the different solutions described, both with regard to the level of "innovation" (in reference to the state of the art relative to the country of origin), and to the "systemic" dimension of each solution (ranging from punctual interventions to more detailed ones), and also with regard to the completeness and uniformity of the descriptions. This makes a comparison activity between the different solutions particularly complex, if not through a further investigation that uses specific and more structured research methodologies.

Nevertheless, there are numerous points in common between the different cases analyzed, which mainly refer to a basic level of accessibility, especially in relation to the physical accessibility of environments and spaces.

On the other side, the importance that most universities attribute to "Training activities on accessibility issues", for which most of them have described specific activities and solutions developed in recent years, emerges. This appears to be meaningful, and indicative of the acquired awareness of the need to operate above all on the educational and cultural level with respect to the theme of disability.

In order to promote inclusion, it is therefore essential to encourage the maturation, above all, of a collective social conscience on the theme of diversity and the right to equal opportunities for all in the use of environments, products and services. Indeed, the regulations of some countries, often prescriptive and cogent (probably because they are the result of a simple passive response and not participated in requests and political pressures posed by specific "protected" categories), sometimes risk "marginalizing through protection".



In other countries, however, this maturity has been widely achieved, to the point that the solutions adopted in Universities, above all on the organizational level, are no longer strictly referring to students with disabilities, but extended to the totality of the them, without particular distinctions, in a vision of real inclusion.



## **APPENDICES**



# APPENDIX 1: Annex 1 and Annex 2

<p><b>Erasmus+</b></p> <p>Erasmus+ Programme              KA2 - Strategic partnerships for higher education              Project: UNIAALL_Accessibility of Higher Education for Students with Special Needs              Output 05: Case studies of Inclusive Higher Education in Europe</p> <p><b>Annex 1:</b>  <b>Synthetic framework for accessibility of university environments and services</b></p> <p>University: .....</p> <p>Contact person for the survey (Rapporteur): .....</p> <p>email: ..... tel: .....</p> <p>Disability Office (if available):              responsible: .....</p> <p>email: .....</p> <p>address: .....</p> <p><b>Descriptive sheet of the University</b></p> <ul style="list-style-type: none"> <li>- Summary of the University and its locations (year of foundation, number of departments / degree courses (bachelor and master), number of locations (if located on multiple campuses), indicative number of buildings, etc.); .....</li> <li>- Total students .....</li> <li>- Total employees: .....</li> <li>- Total students with disabilities (Possibly distinguishing types of disability: persons with physical disabilities, with hearing impairment, with visual impairment, etc.); .....</li> <li>- Possible (if any) institutional documents related to accessibility (a list with a very short description of contents); .....</li> <li>- (Attach any documents, charts, tables, etc. Related to the descriptive elements listed above)</li> </ul> <p><b>Task:</b> Brief description of the main design solutions related to environments and services to facilitate the study to students with</p>	<p><b>special needs (and relationships with the national legislative structures and the implementation processes/measures that made it possible).</b></p> <p>N.B. The descriptions provided must be short and limited to information only, without any graphic concern.</p> <p>For the "national legislative framework" for each of the following six types of accessibility action, are asked only a short introduction (optional), followed by a list of the references/names of the most important laws and a brief description of the main contents of each (300-500 characters each, with spaces).</p> <p>For the "main solutions adopted" at his University, the rapporteur must provide only a brief description (300-500 characters each, with spaces) of the main "accessibility solutions", both realized or planned.</p> <p>Where possible, attach any pictures (photos, maps, tables, etc.) related to the adopted solutions.</p> <p><b>1. Accessibility of physical environment</b> (overall accessibility of outdoor and indoor environment for teaching and socialisation, of furniture, of signage and way-finding systems, of emergency evacuation, etc.)</p> <p><b>1.1: National legislative framework</b> (main laws and implementation processes):              .....</p> <p><b>1.2: Main solutions adopted at our University:</b>              .....</p> <p><b>2. Accessibility and availability of the support services for students with SEN/ Special Education Needs</b> (counselling services, diagnostic centre, study support, assistance, sign language interpreting, etc.)</p> <p><b>2.1: National legislative framework</b> (main laws and implementation processes):              .....</p> <p><b>2.2: Main solutions adopted at our University:</b>              .....</p>
<p><b>3. Information and communication accessibility</b> (ICT systems, assistive technology, university web-pages, and AIS – academic information system)</p> <p><b>3.1: National legislative framework</b> (main laws and implementation processes):              .....</p> <p><b>3.2: Main solutions adopted at our University:</b>              .....</p> <p><b>4. Accessibility of study materials for students with sensorial impairments and students with specific learning disorders</b></p> <p><b>4.1: National legislative framework</b> (main laws and implementation processes):              .....</p> <p><b>4.2: Main solutions adopted at our University:</b>              .....</p> <p><b>5. Methods and tools for monitoring accessibility</b> (committees and assessment structures, tests and check-lists, etc.)</p> <p><b>5.1: National legislative framework</b> (main laws and implementation processes):              .....</p> <p><b>5.2: Main solutions adopted at our University:</b>              .....</p>	<p><b>6. Training activities on accessibility issues</b> (staff training or compulsory didactic activities included in the student's study plans related to "design for inclusion" – Universal Design, Inclusive Design, Design for All)</p> <p><b>6.1: National legislative framework</b> (main laws and implementation processes):              .....</p> <p><b>6.2: Main solutions adopted at our University:</b>              .....</p>

Annex 1



Erasmus+ Programme  
KA2 - Strategic partnerships for higher education  
Project: **UNIALL\_Accessibility of Higher Education for Students with Special Needs**  
Output 05: **Case studies of Inclusive Higher Education in Europe**

**Annex 2:**  
**Good design practices for environments and services**

University: .....

Contact person for the survey (Rapporteur): .....  
email: ..... tel: .....

**Task: Detailed description of a design solution (or a solution system) related to one of the following types that is considered to be the most innovative one to encourage inclusive accessibility of higher education to students with special needs.**

**a. The described solution can be considered within the following type of accessible solutions:**

- 1. Accessibility of physical environment** (overall accessibility of outdoor and indoor environment for teaching and socialization, of furniture, of signage and way-finding system, of emergency evacuation, etc.).
- 2. Accessibility and availability of the support services for students with SEN\_Special Education Needs** (counselling services, diagnostic centre, study support, assistance, sign language interpreting, etc.).
- 3. Information and communication accessibility** (ICT systems, assistive technology, university web-pages, and AIS – academic information system).
- 4. Accessibility of study materials** for students with sensorial impairments and students with specific learning disorders.
- 5. Methods and tools for monitoring accessibility** (committees and assessment structures, tests and check-lists, etc.)
- 6. Training activities on accessibility issues** (staff training or compulsory didactic activities included in the student's study plans related to "design for inclusion" - Universal Design, Inclusive Design, Design for All)

**b. Brief description of the reasons why the solution described is considered innovative or simply because it has been chosen among others by the University in terms of accessibility (500-1000 characters, with spaces):**

**c. Detailed description of the selected accessibility solution:**

- Title: .....
- Text (max 5000 characters, with spaces): .....
- Images: Include images (photographs, drawings, diagrams, etc.) useful to understand the accessibility described (no less than 2 images, in good resolution, with any references included in the text, and eventual more images with a lower resolution).

Annex 2



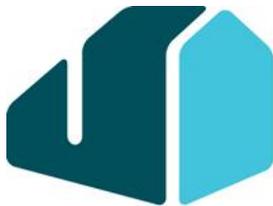
## **APPENDIX 2:**

### **Pictures and images from the analysed Universities**

- 2.1 Hasselt University (Hasselt, Belgium)**
- 2.2 Palacky University (Olomuc, Czech Republic)**
- 2.3 ESADSE (Saint Etienne, France)**
- 2.4 Karlsruhe Institute of Technology (Karlsruhe, Germany)**
- 2.5 National and Kapodistrian University of Athens (Athens, Greek)**
- 2.6 Polytechnic University of Bari (Italy)**
- 2.7 Norwegian University of Science and Technology (Trondheim, Norway)**
- 2.8 Slovak University of Technology (Bratislava, Slovak)**
- 2.9 Mid Sweden University (Sundsvall, Sweden)**



## 2.1 Hasselt University (Hasselt, Belgium)



**UD Woonlabo**  
Voor nu, voor later, voor iedereen



Images from the The UD Living Lab



## 2.2 Palacky University (Olomuc, Czech Republic)



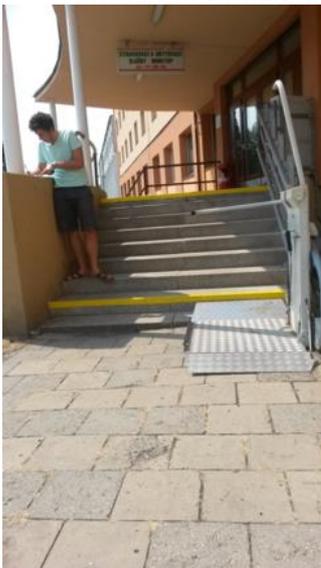
Symbols for categorizing accessibility of buildings:  
A) accessible  
B) partially accessible  
C) non-accessible or accessible with difficulties



J. L. Fisher dormitories



Canteen on Šmeralova street

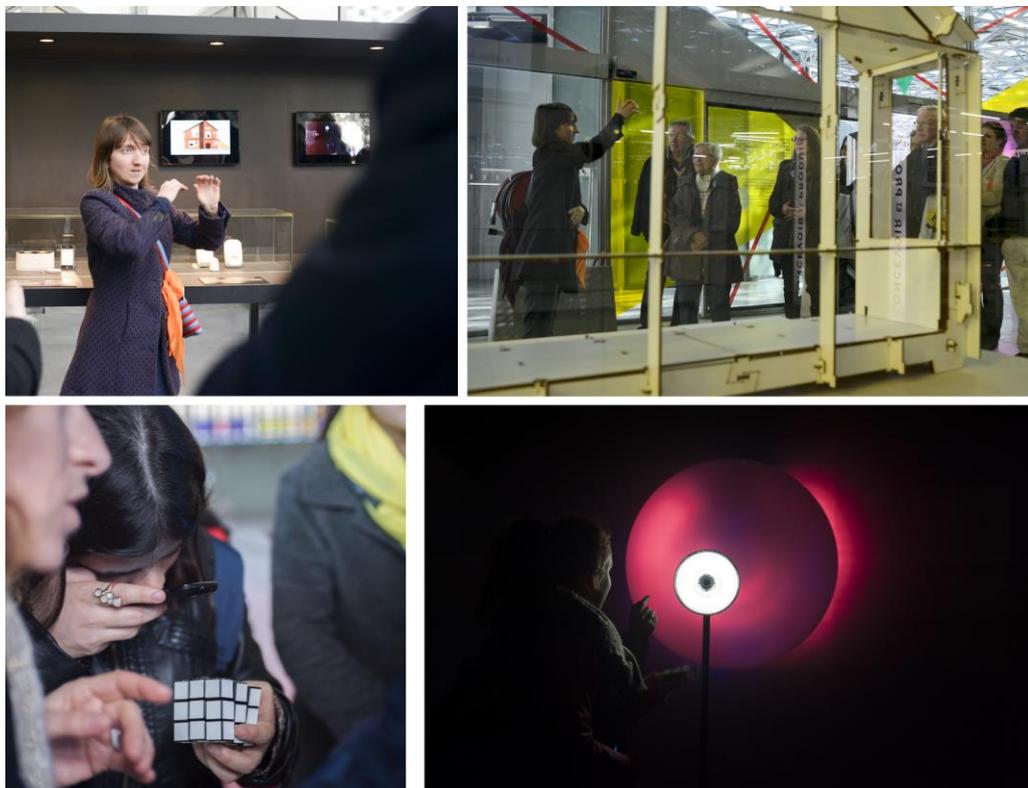




### 2.3 ESADSE (Saint Etienne, France)



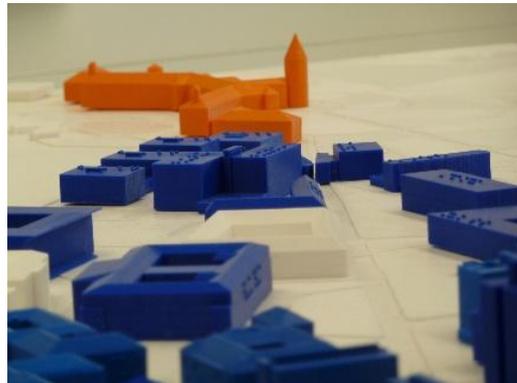
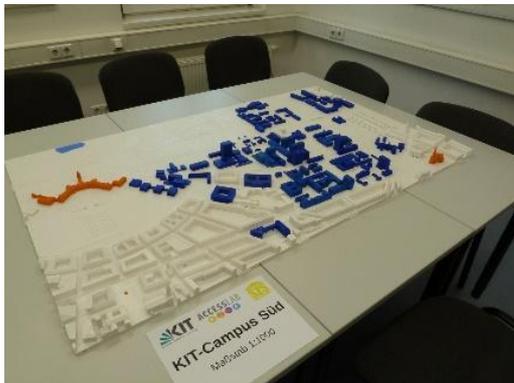
Images from La Platine building



Images on guided tours for the hearing/seeing impaired during Biennale Internationale Design Saint Etienne ((c) Alexandra Caunes)



## 2.4 Karlsruhe Institute of Technology (Karlsruhe, Germany)



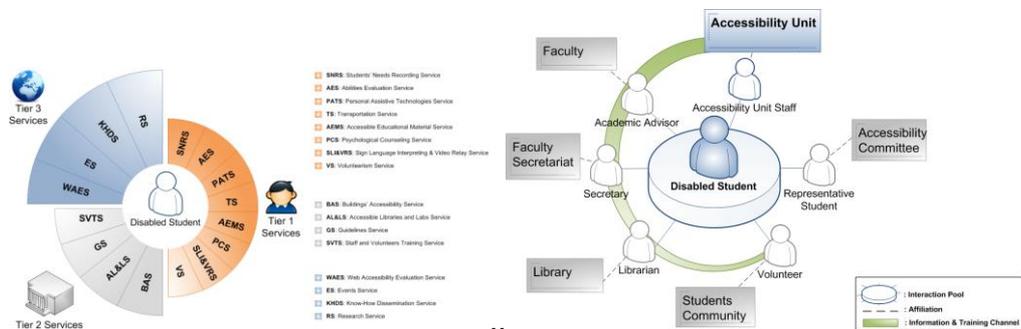
3D model of the KIT campus with Braille labels



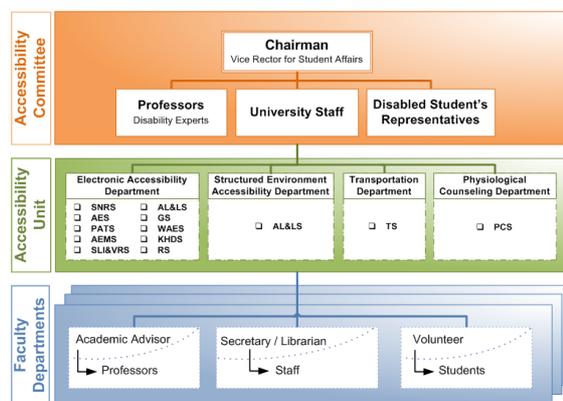
3D scanning and printing



## 2.5 National and Kapodistrian University of Athens (Athens, Greek)



The model of EKPA for accessibility services' for students with disabilities (fig.1) and accessibility stakeholders' interactions (fig.2)

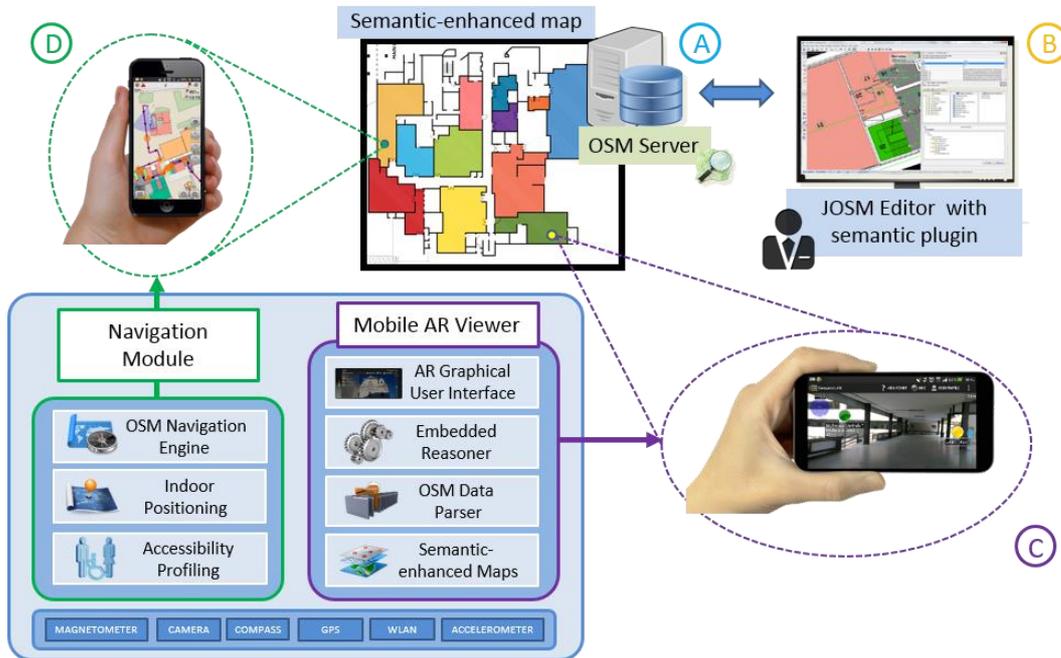


Organization and Management of the University of Athens' Accessibility Unit (fig.3)

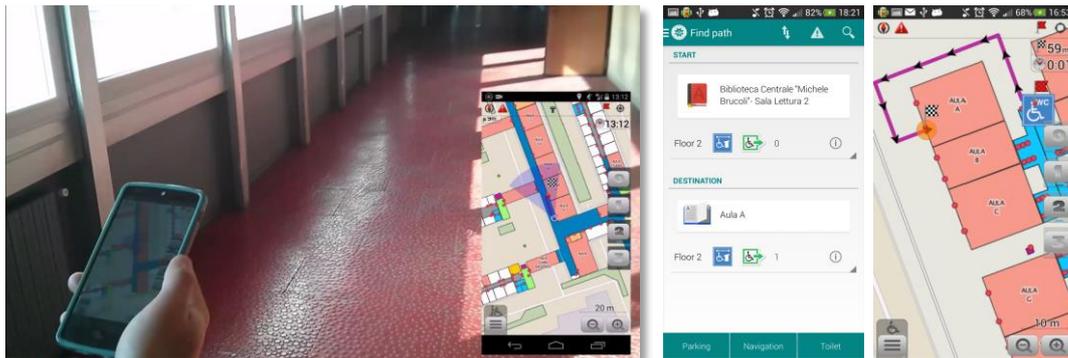




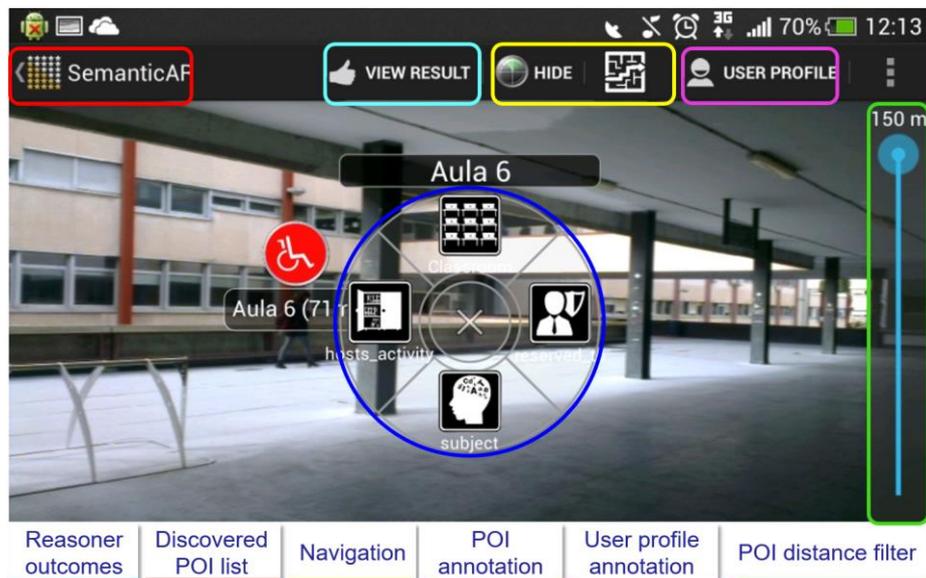
## 2.6 Polytechnic University of Bari (Italy)



System framework and architecture (fig.1)



Mobile client: indoor navigation (fig.2)



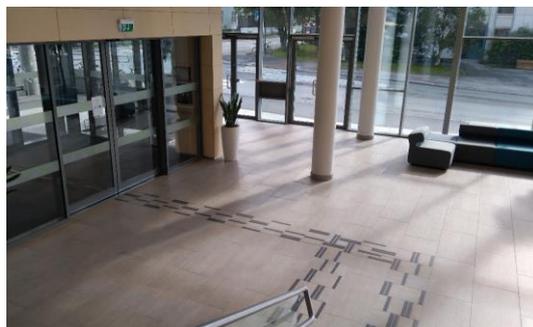
Mobile client: AR view (fig.3)



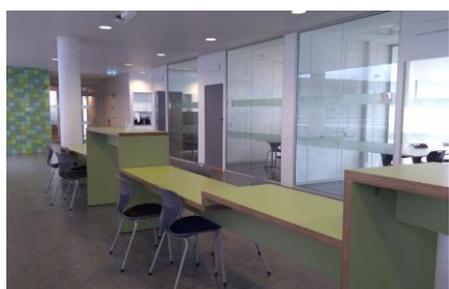
## 2.7 Norwegian University of Science and Technology (Trondheim, Norway)



NTNU in Trondheim, University Centre at Dragvoll (fig. 1, 2)



NTNU in Trondheim, Business School - entrance hall and tactile orientation plan of the building (fig. 3 a,b)



NTNU in Trondheim, Business School - various height levels of the tables and information services (Fig. 4 a,b)



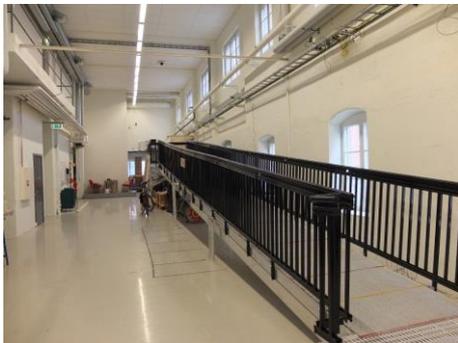
NTNU in Gjøvik, Student Centre (G-bygget, 2006, Architect: Futhark) - entrance part with tactile paving and contrast marking of the glass doors (Fig. 5 a,b,c)



NTNU in Gjøvik, Building A – atrium and glass walls provide simple and intuitive orientation and use (Fig. 6 a,b)



NTNU in Gjøvik, Building A – wide corridors, glass walls, colour contrasts and good signage provide easy movement and orientation within the building (Fig. 7 a,b)



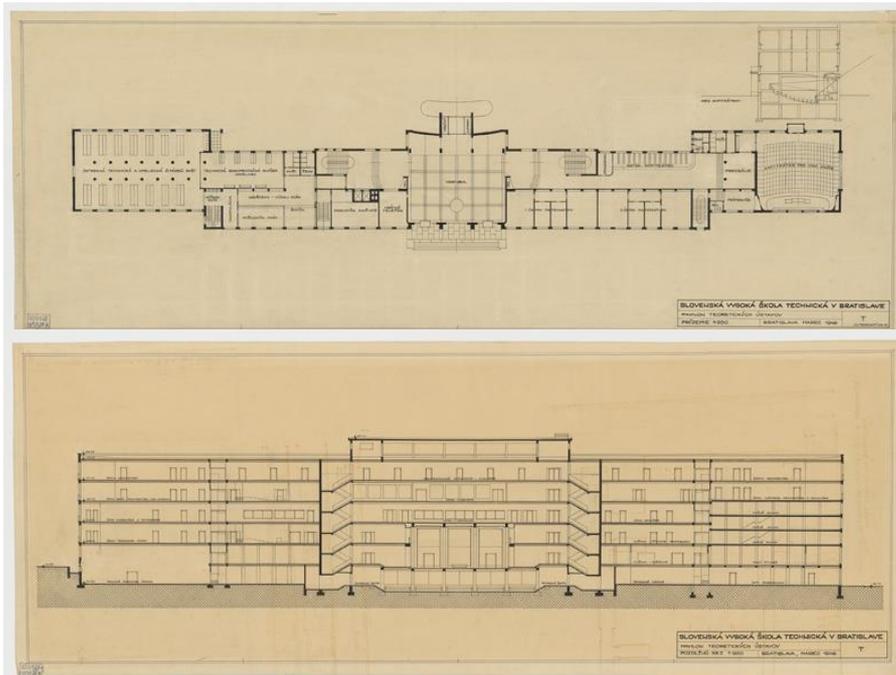
Full Scale Lab (Fig. 8 ) and Lecture room (Fig. 9)



Human Senses Lab (Fig. 10)



## 2.8 Slovak University of Technology (Bratislava, Slovak)



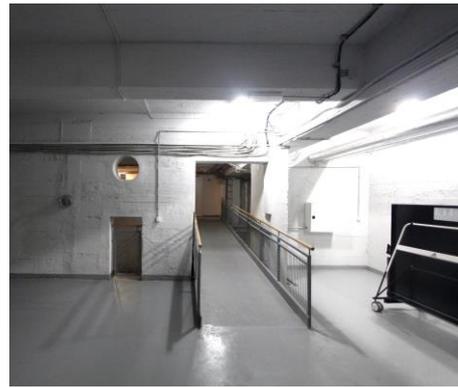
Original building drawings by architect Emil Belluš: ground floor plan and section (fig. 1, 2))



View on FA STU from Namestie slobody (fig. 3)



Main building entrance including new lift on the left side and historical photo (Fig 4,5)



Ramps in the basement which made accessible the lifts in the left and right wing of the building (Fig. 6,7)



Learning facilities provide the required flexibility (Fig. 8,9)



Figure 10 - FA STU tactile way-finding plan



Sensitization exercise at STU (Fig. 11,12)



## 2.9 Mid Sweden University (Sundsvall, Sweden)



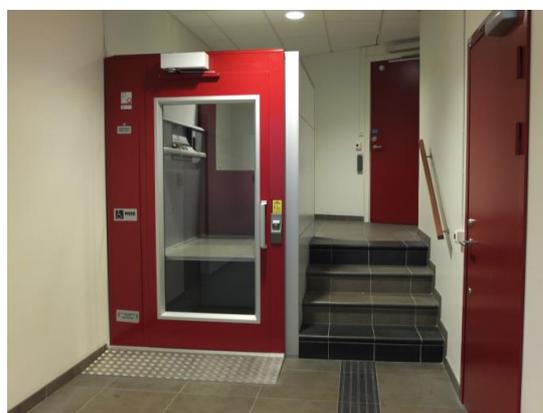
The campus of Mid Sweden University in Sundsvall (Fig. 1)



Historic and new buildings of Mid Sweden University in Sundsvall (Fig. 2a,b)



Glass building (circulation and socializing area) (Fig. 3a) and New building of the Department of Industrial Design (Fig. 3b)



Building of the Department of Industrial Design – circulation areas with tactile paving and colour contrast solutions (Fig. 4 a,b)



Building of the Department of Industrial Design - glass walls and colour contrast solutions provide simple and intuitive orientation and use (Fig. 5a,b)



Building of the Department of Industrial Design – accessible toilet room (Fig. 6)



Design Research Lab – User stage with three projection walls (Fig. 7a) and Design Research Lab – User stage while testing the design concepts (Fig. 7b) (source: Abdipour, M., Lorentzen, L., Olin, H.)



## **UNIALL**

### **Accessibility of Higher Education for Students with Special Needs**

## **Credits**

### **Activity Leading Organisation: UNIVERSITY of CHIETI-PESCARA**

Leading Organisation working group: **Giuseppe Di Bucchianico** (scientific coordinator), and **Antonio Marano**

STU\_Bratislava working group: **Zuzana Ceresnova** (scientific coordinator), and **Lea Rollova**

Masaryk University\_Brno working group: **Petr Peňáz** (scientific coordinator), **Michaela Hanousková** and **Boris Janča**

### **Data collection:**

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- Palacky University (Olomuc, Czech Republic)  
*Contact person and rapporteur: **Lucia Pastieriková***
- ESADSE (Saint Etienne, France)  
*Contact person: **Josyane Franc**; rapporteurs: **Mikaël Mangyoku** and **Camille Vilain***
- Karlsruhe Institute of Technology (Karlsruhe, Germany)  
*Contact person and rapporteur: **Karin Müller***
- National and Kapodistrian University of Athens (Athens, Greek)  
*Contact person and rapporteur: **Georgios Kouroupetroglou***
- Polytechnic University of Bari (Italy)  
*Contact persons and rapporteurs: **Melita Casamassima** and **Michele Ruta***
- Norwegian University of Science and Technology (Trondheim, Norway)  
*Contact person: **Anne Britt Torkildsby**; rapporteur: **Zuzana Ceresnova***
- Slovak University of Technology (Bratislava, Slovak)  
*Contact person and rapporteur: **Lea Rollova***
- Mid Sweden University (Sundsvall, Sweden)  
*Contact person: **Lena Lorentzen**; rapporteur: **Zuzana Ceresnova***