Progression of Accessibility Centres in higher Education for Students with disabilities in North Africa (PACES)

Project Number: 585901-EPP-1-2017-1-UK-EPPKA2-CBHE-JP (2017-2897/001-001)

ERASMUS + KA2
Capacity Building in the field of Higher Education

DEV2.1	**Physical Accessibility Centre Development**
Prepared by	University of Maribor
Contributors	All partners
Work Package	WP2 - Establishment of Accessibility Centres
Type	Report
Date	11-02-2020
Editing	Matjaž Debevc, Peter Čakš, Ines Kožuh, Sarah Merry, Ahmed Mehanna
Form	FINAL REPORT

Progression of Accessibility Centres in higher Education for Students with disabilities in North Africa
Project Number: 585901-EPP-1-2017-1-UK-EPPKA2-CBHE-JP

⊕ http://pacesproject.eu
@ pacesswdproject@gmail.com

1

Table of Contents

PACES

Progression of Accessibility Centres in higher Education for
Students with disabilities in North Africa

Co-funded by the
Erasmus+ Programme
of the European Union

Aim of the Project

The overall aim of the Erasmus+ project "Progression of Accessibility Centres in higher Education for Students with disabilities in North Africa (PACES)" is to set up a programme of initiatives in universities in Egypt and Morocco in order to support the modernisation of higher education by developing Accessibility Centres (static, mobile, and virtual) that will enable students with disabilities (SwD) to access assistive technology and support services such as counselling and peer support.

The project additionally seeks to establish a network of employers and HE institutions in the partner countries with the aim of assisting employers to understand the needs and skills of people with disabilities.

Through these centres and the employer/HEI networks, students with disabilities will be able to gain employability and transition skills in order to move forward into employment.

Brief description of the work package 2 (WP2)

The second work package (WP2) focused on establishing of Accessibility Centres and training of staff of the centre for counselling, monitoring, and coaching of students with disabilities and academic.

The goal of the WP2 was to arrange premises and purchase of technology solutions which will enable equal study. For these centres it was proposed that they should be linked to some already established Centres in the region. To amplify the reach of the Centres, the task was to establish virtual and mobile/pop-up Accessibility Centres which assist students/teachers and can spread policy and information throughout the regions. For the region it was planned to:

- progress 3 existing Accessibilities' Centres and
- set-up 5 new Accessibility Centres

Additionally, the Virtual and Pop-up/mobile Accessibility Centre has been proposed for establishing in each country.

![PACES logo] **PACES**

Progression of Accessibility Centres in higher Education for Students with disabilities in North Africa

Co-funded by the
Erasmus+ Programme
of the European Union

Main tasks of the WP2

Physical access to Accessibility Centres means accessible and appropriate access to buildings, public spaces, and any other place a student with disabilities might need to go for education and educational services and other services, like social and transitional services. Physical access includes things like accessible routes, curb ramps, parking and passenger loading zones, elevators, signage, entrances, restroom accommodations and finally accessible equipment, needed for education and for communication, as defined in UN Convention [UN-CRPD, 2006].

Establishment of Accessibility Centres required in addition to training of staff of the centre for counselling, monitoring, and coaching of students with disabilities and academic there was a need to arrange premises and purchase of technology solutions which will enable equal study.

WP2 has been divided into four parts:

1. In the **first part** the implementation of the plan for the organization of the centre at the university has been proposed, which included arrangements of:
   - premises, staff,
   - storage spaces for technology solutions which will be given to students with disabilities and
   - "quiet room" - the place for students with disabilities, which will be given for study and will have accessible technical devices and, if necessary, an accessible toilet and a shower.

2. In the **second part** purchase of the appropriate equipment and training of staff to work with this equipment has been planned.

3. In the **third part** implementation of virtual computer tools and web-based environments, which will be prepared and used for students with disabilities was planned. This enable accessibility of electronic documents and access to resources and to collaborative and cooperative distance education if necessary.

Progression of Accessibility Centres in higher Education for Students with disabilities in North Africa
Project Number: 585901-EPP-1-2017-1-UK-EPPKA2-CBHE-JP

http://pacesproject.eu
pacesswdproject@gmail.com

4

4. In the **fourth part** the opening of the Accessibility Centre and its promotion has been planned. The willingness of universities and local ministries to implement the Accessibility Centre and the strong cooperation with the local computer centres of universities is essential.

Deliverables of the WP2 has been following:

DEV2.1 Physical Accessibility Centre Development
DEV2.2 Equipment and staffing procured
DEV2.3 Virtual accessibility set up
DEV2.4 Mobile/pop-up Accessibility Centre developed

This document reports the work on DEV2.1 Physical Accessibility Centre Development.

Methodological Framework

We used an appreciative inquiry methodological framework as set in WP1 and upgrade it with some specific approaches based on WP2 – technology implementation aspects.

Qualitative methodology based on paradigmatically different ontological and epistemological assumptions as it presented in Educational information technology research methodology by Twinning [Twinning, 2010] will be implemented. He defined theoretical stances and approaches which can be used in survey as planned in WP2.

Data Collection Methods and Analysis

As a base for work on WP2 the results of WP 1 online survey (questions regarding Support for Students with Disabilities, Technology and Assistive Technology) will be used. After we will upgrade those results with detailed online survey and interviews on present technologies (hardware, software) on faculties and on their needs.

Data Collection Methods

1)   With the help of online survey, we collected data on current conditions of work at partner institutions for students with disabilities. We focused on existing premises, computer and other equipment, available software and according to their needs on their leaks.

2)   The other part was interview where the detailed analysis (check list of facilities and technologies) project partnered institutions has been performed. According to different parameters we collected needed data to grasp the picture of the best possible equipment list for centres at partnered universities.

Data Analysis

1)   Our online survey was a combination of quantitative and qualitative questions which has been analysed with common tools, such as Microsoft Office software.

2)   Half-structured interview data has been combined with results of online survey to design the most suitable equipment list for partnered centres.

Progression of Accessibility Centres in higher Education for Students with disabilities in North Africa
Project Number: 585901-EPP-1-2017-1-UK-EPPKA2-CBHE-JP

http://pacesproject.eu
pacesswdproject@gmail.com

6

Tasks and outcomes of the DEV2.1 Physical Accessibility Centre Development

Tasks

The work for the deliverable DEV2.1 involves firstly the preparation of plans (reports) for preparation of premises at the university, and secondly the physical set up of the centre at the institution. In the first part the plan for the organization of the centre at the university has been implemented on the base of survey of best practice cases and analysis of existing equipment on faculties, which included arrangements of:

1. **Centre services analysis.**
2. **Physical base for staff and students.**
3. **Premises for storing the equipment, intended for student with disabilities.**
4. **"Quiet room" – a place for students with disabilities which will be provided for study and will have accessible technical devices and, if necessary, an accessible toilet and a shower.**

The main part of our work as a leading partner at WP2 was to empower partners with all needed knowledge for establishing accessibility centers. Our focus was strongly on most efficient accessibility equipment, suitable for their needs, whether they already have some equipment or not. Within the Work package 1 the analysis of the existing equipment was made. Based on those reports we combined suggested equipment with their current situation.

Task 2 (Physical base for staff and students), task 3 (Premises for storing the equipment, intended for student with disabilities) and task 4 (Quiet room) were in domain of the partners. Some of them already had the suitable location for accessibility center, others were empowered to establish them in the most suitable premises.

Centre services and equipment analysis

This main task of the first part of the Work package 2 "Centre services and equipment analysis" was divided into four segments:

- **General equipment for SwD analysis**
- **General center services analysis**

- **Best practices examples**
- **Definition of center services**

Brief description of each segment is listed below, and all related annexes are listed at the end of the document.

General equipment for SwD analysis

The importance of ICT use in education for SwD is strongly emphasized on national and international level, so there is an increasing need for development of accessible e-learning and its inclusion into public administration and private corporations as well. There was a strong need to raise awareness of using the ICT for teachers and personnel working with SwD. This is especially crucial since the UN Convention on Rights of Persons with Disabilities was ratified by most of the countries over the world. Therefore, for Higher Education Institution (HEI) staff an analysis and report of the accessible equipment has been developed (**ANNEX A**).

It was divided into **three main segments:**

- Advice for the adequate purchase of equipment
- Adaptive solutions for d/hh students
- Adaptive solutions for blind and weak sighted students

Upon introduction chapters the equipment was divided into several segments, fulfilling the requirements of the project:

- CATEGORY 1: Adapted Learning Management System for deaf
- CATEGORY 2: Screen magnifier for partially sighted
- CATEGORY 3: JAWS Scanner software, Braille readers and PDF readers
- CATEGORY 4: Desktop PC, laptop and tablet
- CATEGORY 5: Portable Hearing Loops and Infrared systems for hearing aid users
- CATEGORY 6: HD Video cameras, web video cameras, wireless microphones
- CATEGORY 7: Steno writer for subtitling
- CATEGORY 8: LCD Large screen television
- CATEGORY 9: Multipoint videoconference system
- CATEGORY 10: Web conferencing and collaboration software
- CATEGORY 11: Voice recording tools

Progression of Accessibility Centres in higher Education for Students with disabilities in North Africa
Project Number: 585901-EPP-1-2017-1-UK-EPPKA2-CBHE-JP

http://pacesproject.eu
pacesswdproject@gmail.com

8

![PACES logo] **PACES**

Progression of Accessibility Centres in higher Education for
Students with disabilities in North Africa

Co-funded by the
Erasmus+ Programme
of the European Union

General Centre Services Analysis

Centre services analysis has been made at the University of Maribor and at partner institutions. The uses of services for SwD was researched to get the picture of their current facilities (premises, technology – hardware and software) and services.

An online survey has been made by Coventry University and reported in the WP1. This data was used as a basis for the subsequent work packages of the project (**ANNEX A1**) and was dealing with number of assistive technologies, staff support and maintenance, as well as online study tools available at partnered universities.

Based on online survey the List of available equipment at partnered universities was prepared. All the available technologies have been listed and compared within universities. It enabled us to see what the gap in equipment for SwD between partners in the project is (**ANNEX A2**).

Best practices examples

In-depth research of other universities centers worldwide (facilities, services) has been made in order to make a list of best practices examples. 11 universities around the world were part of this content study:

1. University of Leicester – AccessAbility Centre, USA
2. BYU – University Accessibility Center, USA
3. Auburn University – Office of Accessibility, USA
4. Santa Monica College – Disability Resources, USA
5. Harvard University – University Disability Services, USA
6. Kenyon College – Students Accessibility and Support Services, USA
7. University of Florida – Disability Resource Center, USA
8. University of Zürich, CH
9. San Diego State University – Students Disability Services, USA
10. University of Oregon – Accessible Education Center, USA
11. Utah Valley University – Office of Accessibility Services, USA

University of Maribor made the first overview of general centre services analysis based on the best practice examples in Accessibility Centres at universities around the world and reported proposal at the project and Train the Trainers meeting in Maribor in September 2018 for:

PACES

Progression of Accessibility Centres in higher Education for Students with disabilities in North Africa

Co-funded by the
Erasmus+ Programme
of the European Union

a) **Accessibility Centre services**
b) **Accessibility Centre services on the web**

All available information was gathered together with web page content analysis and marked with comments. The full list of selected contents has been made and is provided in **ANNEX B**. On the base of services analysis at the partnered institutions and in-depth research of other centres worldwide definition of centre services has been made and is listed below.

Ad a). Accessibility centres services has been divided into three segments (Support for students, Campus infrastructure and Assistive technology) as seen in the Figure 1.

SUPPORT FOR STUDENTS

- Getting started
- Guidance
- Tutoring support
- Evaluation of study process

CAMPUS INFRASTRUCTURE

- Evaluation of premises
- Planning the premises
- Supervising

ASSISTIVE TECHNOLOGY

- Equipment
  o List
  o Guidelines (student, staff)
  o Loan
- Technologies to assist with learning
- Accessible library

Figure 1: Proposal for services for Accessibility Centres

Ad b). Accessibility centres services on the web has been divided into four categories (Campus Access, Information for students, Information for staff, Basic info) as seen in the Figure 2. This study was also used as the basis for dev 2.3 (virtual accessibility set up).

![PACES logo] PACES
Progression of Accessibility Centres in higher Education for
Students with disabilities in North Africa

Co-funded by the
Erasmus+ Programme
of the European Union

CAMPUS ACCESS

• Campus accessibility (+map)

• List of classrooms &
  other facilities

• Parking & transportation

**INFORMATION FOR
STUDENTS**

• Study guidelines

• Local disability coordinators and
  student tutors

• Assistance with time management
  and organizational strategies

• Service animals guidelines

INFORMATION FOR STAFF

• Guidelines for interacting with
people with disabilities

• Assistance with time management
and organizational strategies

• Volunteer opportunities

BASIC INFO (Q&A)

Figure 2: Proposal for services for Accessibility Centres on the web

The second part of 2.1 (Physical centre set up) has been focused on establishing accessibility centres on locations at partnered universities. The aim of the project was whether to upgrade existing accessibility centres or establish the new ones. Partner were asked to provide:

- **4.1.3 Physical base for staff and student** (Sets up of a physical base for staff and students in existing or new places).

- **4.1.4 Premises for storing the equipment** (Premises for storing the equipment, intendent for students with disabilities. Appropriate facilities with the defined level of suitableness for storage has been request.

- **4.1.5 Quiet room** (A place for students with disabilities, intended for study with accessible technical devices and, if necessary, an accessible toilet and a shower. Set up of quiet room on partnered faculties was planned to be implemented if possible and wished.)

Report on those three points is an integral part of Action plan within deliverable WP2.2.

Deliverable

The first deliverable within the Work package 2 was to get an in-depth analysis which would provide an information field for following tasks and outcomes. Although the goal of the first part was Physical centre set up, the deliverable concentrates on setting up the guidelines and leaving partners with responsibility to find suitable premises. Location and staff are a part of deliverable 2.2 (Action plan).

DEV 2.1:

Analysis report on services, based on the survey and in-depth research of other centers has been performed and used as a basis for next parts of Work package 2 (ANNEX A, A1, A2, B).

Outcome

With the research and good practices guide we have tried to raise awareness of importance of accessibility centres as a main point for equal study conditions for SwD. We have reached increased awareness of importance of centres for disabled students at faculty among students, staff and general society.

ANNEX A: Accessible equipment report

Authors: Mark Žmavc, Dr. Matjaž Debevc (University of Maribor, Slovenia)

1. INTRODUCTION

Due to rapid development of information-communication technology (ICT), we are witnesses of significant differences in all areas of life. These have been especially obvious in the field of education and inclusion of persons with disabilities (PwD). Consequently, in modern technologically oriented society, PwD gained possibilities for equal inclusion in social, societal and economic environment. In this way, quality computer-based education that would be suitable for all, disregarding their abilities and motives, has become an important question in all environments, especially in developing countries. Necessities for continuous renewal of skills caused that education and content have not only been adjusted to young generations, but also PwD, who have their own needs and requirements. This leads to the need that the ways of knowledge transfer and educational content should be adjusted to the needs and requirements of PwD as well.

PACES

Progression of Accessibility Centres in higher Education for Students with disabilities in North Africa

Co-funded by the
Erasmus+ Programme
of the European Union

Current situation on the labour market, e.g. high competitiveness regarding the workforce, shows the urgency that PwD should be involved in educational environment specifically tailored for them, so that they are able to reach their professional and personal goals.

The output of merging both technology and education is e-learning as a field which allows distance learning and learning with techniques tailored to users. Concurrently, electronic media and devices are used for facilitating access to learning material [1].

The importance of ICT use in education for PwD is strongly emphasized on national and international level, so there is an increasing need for development of accessible e-learning and its inclusion into public administration and private corporations as well. However, the above-mentioned action is not sufficient, but what is needed is rather additional public awareness raising in teachers and personnel working with PwD. This is especially crucial at the moment, when UN Convention on Rights of Persons with Disabilities is ratified by most of the European countries. Hence, Higher Education Institution (HEI) staff needs to understand how the use of equipment can make their life as well as life of their disabled students, easier.

However, there are still too many open questions at HEIs about how to develop accessible e-learning material and teaching process. It is essential to be aware that it is important how the e-learning material is developed for persons with different types of disabilities, such as d/Deaf and hard of hearing (D/HH), blind and weak-sighted and persons with other types of disabilities. The familiarity with specific needs and requirements of all relevant types of disabilities is crucial and accordingly the system should be adapted.

One of the reasons for paying attention to accessibility lies in statistics, as well. According to World Health Organisation [2], about 15% of the world's population lives with some form of disability. Out of these, 2-4% experience significant difficulties in functioning. When studying at HEIs is concerned, 18% of all Europeans go to university, while only 9% of Europeans with disabilities do so [3]. To the best of our knowledge, there is still a lack of reports on how many SwD actually study on HEIs. In 2016, there was a study conducted within the EU project Trans2Work (http://trans2work.eu/). A total of 170 SwD from Serbia, Montenegro and Bosnia & Herzegovina participated in this study. Out of these, 23.53% had visual impairment, 5.88% had hearing impairment, and 58.24% had physical disability or orthopaedic impairment.

Accessibility provides a specific form of social cohesion, since independence is best for users and the most efficient support for our social systems. Accessibility also makes independent and reduces social costs in

PACES

Progression of Accessibility Centres in higher Education for
Students with disabilities in North Africa

Co-funded by the
Erasmus+ Programme
of the European Union

care, rehabilitation, inclusive education, employment and all daily activities. Currently, there are technical and organisational regulations in use, and tools for implementing accessibility, such as the WCAG 2. Also, ITU, IEC and ISO encourage "the development of standards that take account of the widest range of characteristics and abilities of persons, including in particular those of older persons, children and PwDs" [4].

The aim of this document is to present the essential issues which should be followed when purchasing accessible equipment, emphasizing the needs and requirements of D/HH, blind and weak sighted persons. Moreover, concrete advice for adequate purchase of equipment is provided, while recommendation for certain existing adaptive solutions for D/HH, blind and weak sighted are provided as well.

2. GOALS FOR USING ACCESSIBLE EQUIPMENT

The first step towards development and implementation of new systems accessible to all is familiarity with accessible equipment. It is possible to define several goals for use of accessible equipment in education, such as:

1. **Technology significantly increases independence of PwDs.**
   D/HH persons can receive the e-learning material not only in written language, but also in sign language which can be considered as a mother tongue to many of them. Blind persons can now read the books, using software recognizing print or buying e-books and using screen reading software.

2. **Equipment allows PwD to have the same chances during exams and in the same time it supports teachers in preparation of the exams.**
   D/HH persons can more easily understand the content by providing sign language interpreter video. Accordingly, if the teacher poses a question, D/HH person may understand it to a greater extent when the question is displayed in sign language as well. Moreover, additional time should be ensured, so that the D/HH may not be under time pressure. As far as blind and weak-sighted persons are concerned, technology provides several opportunities to reduce barriers when passing written exam. For instance, usually, blind person needs magnifying

glasses for reading and it may take him/her more time than for average student. Similarly, it takes more time for teachers to read the student's answers. However, when technology is used during the exam, electronic version of exams may replace the paper-based version which may simplify the process of reading and answering.

3. **Technology increases chances for good communication.**
Many disabilities influence the communication between disabled student and his professor in a negative way. It implies to d/Deaf persons and people with hands disabilities not being able to write in normal way. Also, blind persons may face difficulties in written communication. Hence, use of accessible technology may reduce such barriers.

4. **Technology supports people not being able to read regular books.**
Deaf student should be provided by the content in language adequate for them, e.g. sign language, and in a form adjusted to their capabilities, e.g. reading capabilities. Unfortunately, not all the deaf, whose primary language is sign language, are able to capture written information in the same way as hearing people do, so it would be suggested to provide easier-to-read written learning material. When learning material is provided in sign language by using sign language interpreter video, captions should be used concurrently since results of the previous study [5] show that the comprehension of the content presented in sign language video increased by 24% among deaf viewers and 42% among hard of hearing viewers.

Likewise, for blind students is simply impossible to read printed books and for low vision is often difficult, so the technology adapter allows them to read the electronic books.

5. **Accessible technology supports academic teachers to work with disabled students in their groups.**
Having a d/Deaf or blind student, teacher can send all messages to him/her by e-mail or by video message. Student can prepare their homework and other assignments on his/her computer and in this way allow the teacher to read the electronic material prepared by them. Thus, it is necessary to raise awareness of academic staff on the role of accessibility and its use during the classes. In some cases when material does not meet standards of accessibility, even the most advanced technological solutions will not be effective enough to guarantee the independent access to such material. On the other hand, producing accessible materials does not cost in comparison to adapting not accessible materials.

6. **Equipment allows PwDs prepare for work.**
   In many cases, the use of assistive technologies enables PwDs to perform the work, and can importantly increase its effectiveness.

3. ADVICE FOR ADEQUATE PURCHASE OF EQUIPMENT

Before purchasing of the equipment is conducted, it is important to be aware of the rapid changes on the market and different way of transmitting information. Stand-alone computers were popular until recently. Currently, the use of mobile devices, such as smartphones and tablets, is at the forefront. Likewise, these devices are personalized and adapted to the user needs to a greater extent.

As a result, we face the situation where students with disabilities (SwD) are less likely to use traditional stand-alone computer devices, but rather they prefer to use personal, portable and mobile devices. On the other hand, the accessible equipment can be in most cases more expensive than standard, mostly non-accessible devices.

Another issue is the assumption that the devices are purchased only for already existing SwD. In other words – many HEIs present the attitude that purchasing of adaptive solutions in advance has no sense. However, for many SwD the information about available accessible e-learning and equipment is crucial when selecting the HEI they want to study at.

Taking these factors into consideration, during the purchase of equipment the following criteria should be respected:

1. Choose first the solutions accessible to persons with different types of disabilities or being possible to connect with many different accessible tools.
2. Do not purchase many pieces of the same type of disability, but rather be prepared for many different situations and types of disabilities.
3. If possible, choose rather portable equipment, which can be used both as the classroom equipment as well as personal equipment.
4. Prepare clear procedures of obtaining this equipment, i.e. whether it is possible to rent it, for what period of time, in which classroom situations it can be used by students, etc.

PACES

Progression of Accessibility Centres in higher Education for
Students with disabilities in North Africa

Co-funded by the
Erasmus+ Programme
of the European Union

4. ADAPTIVE SOLUTIONS FOR D/HH STUDENTS

When advising on equipment purchase for d/Deaf students, it is essential to consider two issues:

- providing written information in sign language video as an online video (e.g. video conference) or offline video (e.g. webinar);
- considering the findings of the previous study [6], we should take into account the fact that natural videos are currently more accepted by the end users than signing avatars and synthetic gestures. In line with that, lately, researchers more focused on development of e-learning materials and systems which use videos and sound amplifiers.

As far as equipment for hard of hearing students, who use hearing aids or cochlear implants, is concerned, firstly, Personal frequency modulation (FM) systems are quite popular. They function as miniature radio stations, operating on specific frequencies, and consist of transmitter microphone used by the speaker (such as the teacher in the classroom, or the speaker at a lecture) and receiver used by the listener with hearing aid.

Secondly, another useful system for hearing aids, which have a chance for using T-Coil, is "induction loop" system. It mangentically transmits sound to hearing aids and cochlear implants with telecoils (T-coils).

Thirdly, for live following the lectures by D/HH students it is advised to use a system for live subtitling, where the sound from the talking person is transmitted to the typist situated in the same room or at the distance

Moreover, another important system is a multipoint videoconference system which enables collaborative work, telepresence, desktop video conferencing, and multipoint connections to users.

For webinars, popular systems are systems like ZOOM, Adobe Connect or Webex, since they allow using video, document sharing and text chatting during the live sessions.

Furthermore, an example of good practice when using the video for D/HH is the Sign language Interpreter Video Player (SLI module) for web sites, which allows multimodal composition of HTML5 video, audio and subtitles on the web page, so that video on demand is displayed over the existing web-page [7]. Accordingly, there is no need for additional implementation of static video clips which usually take much space on the website. Video is activated on demand by end-users and implementation is unobtrusive into

Progression of Accessibility Centres in higher Education for Students with disabilities in North Africa
Project Number: 585901-EPP-1-2017-1-UK-EPPKA2-CBHE-JP

🌐 http://pacesproject.eu
@ pacesswdproject@gmail.com

17

existing websites. The ability of the system is also important in terms of including cross-browser and cross-mobile video player, and that the subtitles are displayed over the existing video clip which simplifies inclusion of different languages

At the University of Maribor, Slovenia, the e-learning portal based on a custom-modified version of Moodle has been already implemented as an e-learning system. The system comprises three parts: contextual, communicative and collaborative. The whole content is accessible in both, written and sign language. Sign language interpreter videos with translation of the written text are fixed and are positioned on the left side of a screen window. The text in written form is on the right. The glossary of potentially unknown words is provided with a transparent SLI module, where the words are explained in sign language and supported with captions. The video is displayed when activated by the user on the website.

The communication part of the abovementioned e-learning system is videoconference communication and collaboration tool, videoforum and chat room. Videoconference provides communication among D/HH students and sign language interpreters with live video, text messages and interactive whiteboard. Videoforum enables the posting of messages in the form of a video recording, along with text message, or just text without a video recording. In terms of collaboration, users can do exercises, quizzes and assignments.

5. ADAPTIVE SOLUTIONS FOR BLIND AND WEAK SIGHTED STUDENTS

When advising on the adaptive equipment purchase for blind and weak-sighted persons, the following goals are to be respected:

1. Allow for independent reading.
2. Allow for independent writing in the way which can be read by sighted persons.
3. Access to information resources.
4. Communication with sighted people.

It is necessary to remember that blind persons do not need special tools to write on computers. They memorize regular keyboard and use it without extra adjustments. However, these persons who know Braille, can take advantage of it, using note takers with Braille keyboards, which consist only 7 keys and are much smaller. Using Braille keyboard in electronic devices does not change the standard of files, so they still can be read in regular computers.

In reading, there are two methods available:

- Reading with speech.
- Reading with Braille displays.

These two ways would not be treated as alternative, because Braille gives much more possibilities and for some task's speech will never be as effective tool as Braille is i.e. programming, proofreading texts etc.

In order to use Braille displays which will allow the use of a PC or tablet, it is still necessary to bear in mind the software connecting such device with computer. It is usually done by screen reading software, which is also used to allow for access to the computer with voice.

Another important option for independent reading is scanning and recognizing printed materials. Even if nowadays more and more books are available in electronic version which does not require further adapting to become accessible for blind readers, there are still many books available only in print version. Such books can be also read by blind students by scanning them on regular scanner, and then by recognizing scanned images with the OCR software (optical character recognition) which converts the images to text files such as word documents.

Taking these conditions into consideration, HEIs will need the following equipment:

a) **Standard laptop(s) or tablet.**
b) **Screen reading software.**
c) **Braille display.**
d) **Scanner with OCR software.**

Ad a. You should remember that on one hand the computers or tablets can be just standard ones. On the other hand, speech solution will always take some part of computer's capacities, so it is recommended to buy medium or higher speed computers.

If laptops with Windows operating systems are taken into consideration, in the next step you will need to purchase screen readers. A very good alternative for it, will be to purchase the products of Apple Inc. Apple products do not need any further adjustments because they have adaptive solutions (not only for blind persons, but also for some other disabilities implemented in operational system. By purchasing this

you will receive high equipment which can be easily available for blind persons, but in the periods when there are not such students, it can be also used for other purposes.

Ad b. It is not necessary now to purchase expensive Screen reading software. There are two options mentioned already above:

- use NVDA free software, which is very efficient and good enough for most University tasks; It is dedicated to computers with Windows systems. Window-Eyes for MS Office User (ver. 10 and up) is also free.
- use Apple products which have screen readers implemented in their operational systems.

Recommendation is to make at least two standard Windows base sets. They will include laptop with screen reader (free software is usually enough); additionally, you can add local language speech synthesizer. Depending on number of students with disabilities, you need to keep at least one for University use (organizing tests, exams etc.), and at least one or more which will be given to students for their personal use.

Two tablets or iPads for portable use. They can be used as personal devices allowing students to read electronic materials, to record lectures, use mail, Facebook etc.

They also have the advantage of being used for persons with different disabilities – i.e. for low vision students; if we talk about tablets, we recommend iPads – at least for the group of totally blind students. iPads have also many functions supporting partially sighted students.

It is necessary to remember that for writing purposes tablets without standard keyboard are not as useful as regular laptops. However, in case of totally blind students you can connect tablet (iPad) with Braille display and in this way you provide students with tools allowing for reading (in this way student can read during class, being able for example to hive speech.

Ad. c. Braille display is one of the most expensive tools, but it is necessary for independent studies and doing more requiring task such as programming, note-taking with simultaneous possibility of checking/reading them, giving speeches/lectures/presentations.

Currently there are two types of such devices available:

• Braille displays working exclusively as output devices to standard computers or tablets. They need software to be installed on such computer to be a manager for such display. Since they have its own Braille keyboard, they give much more flexibility when working with tablets or iPhones.

Unfortunately, they are useless as independent pieces of equipment.

• Second type are Braille display with note takers built-in. They have all functions described above, but when disconnected form laptop or tablet, they can work as independent note taker allowing also for reading files saved in the memory of the display. For that reason, we recommend this solution.
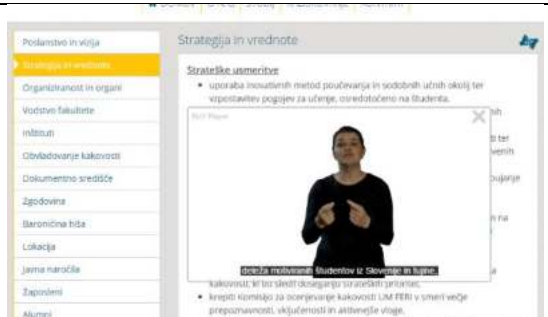
Ad. d. To allow students to read written materials you need one set made of a computer (laptop or regular PC), scanner and OCR software.

Currently, the quality and speed of scanners is so good that we do not recommend any model. In the field of OCR still the best option is Abby Finer Reader.

Having such a set of equipment available, for example, in the library, not only students but also teachers can easily convert written materials to electronic version.

CATEGORY 1: Adapted Learning Management System for deaf

Sign Language Interpreter 5 (SLI5) Video Player for Web Sites

Client: - multimodal composition of video, audio and subtitles - video activation on-demand by end-users - unobtrusive integration into existing websites - cross-browser and cross-mobile video player - Character generator/encoder for subtitling Server: - log into account with credentials - list of video units - subtitling management system - integration package exporter - statistics (impressions)	
URL: http://sli5.slimodule.com/	Price: Unlimited video units: 1.500,00 EUR for three years access NOTE: Videos are situated on the own web server.

Progression of Accessibility Centres in higher Education for
Students with disabilities in North Africa

Co-funded by the
Erasmus+ Programme
of the European Union

CATEGORY 2: Screen magnifier for partially sighted
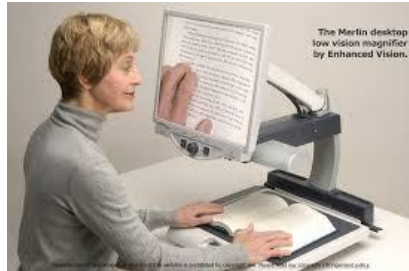
Desktop PC   **Books**   **Handy magnifier**

Magnifier Software

ZoomText Magnifier or Reader / Magnifier	
2 versions of the product: magnifying magnifier-reading (for those who support enlargement also with the speech synthesis)	
URL: ww.zoomtext.com/products/zoomtext-magnifierreader/ http://www.zoomtext.com/products/zoomtext-magnifier/	Price: from 400 – 700 euro

Progression of Accessibility Centres in higher Education for Students with disabilities in North Africa
Project Number: 585901-EPP-1-2017-1-UK-EPPKA2-CBHE-JP

http://pacesproject.eu
pacesswdproject@gmail.com

23

Supervova Magnifier	
3 version of the product – -Only magnifier -Magnifier with reading - Magnifier with screen reader https://yourdolphin.com/supernova/compare	
URL: https://yourdolphin.com/supernova-magnifier http://www.zoomtext.com/products/zoomtext-magnifier/	Price: 350-700

CATEGORY 3: JAWS Scanner software, Braille readers and PDF readers

PACES

Progression of Accessibility Centres in higher Education for
Students with disabilities in North Africa

Co-funded by the
Erasmus+ Programme
of the European Union

Notetaker / Braille displayer - Braille Edge – 40	
- Braille display with built-in note taker	
URL: https://hims-inc.com/products/braille-edge-40/	Price: ~2780 euro

Scanner with OCR software

Abbyy Fine Reader Professional	
- Built-in different languages - For WIN and MAC	
URL: https://www.abbyy.com/finereader/	Price: ~130 euro

Braille watch	
Braille watch	
URL: https://dotincorp.com/	Price: 400 EUR (in USA)

CATEGORY 4: Desktop PC, laptop and tablet (iPad)

Lightwight personal computer (up to 1,5 kg)	
- With HD video camera - High speed wi-fi - Large display	or
	Price: Up to 1.000 EUR
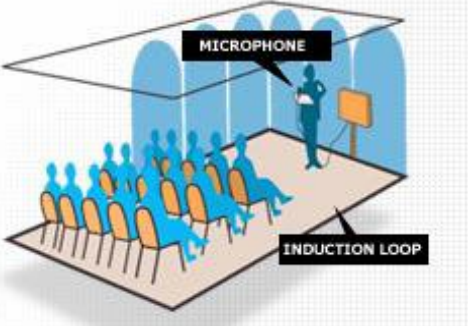
Progression of Accessibility Centres in higher Education for Students with disabilities in North Africa
Project Number: 585901-EPP-1-2017-1-UK-EPPKA2-CBHE-JP

http://pacesproject.eu
pacesswdproject@gmail.com

26

CATEGORY 5: Portable Hearing Loops and Infrared systems for hearing aid users

Radio (FM) Systems	
Personal frequency modulation (FM) systems are like miniature radio stations operating on specific frequencies. Consists: - transmitter microphone used by the speaker (such as the teacher in the classroom, or the speaker at a lecture) - receiver used by the listener with hearing aid.	
URL: http://www.healthyhearing.com/help/assistive-listening-devices/fm-systems	Price: 2.000 EUR – 3.000 EUR

External Boundary Microphone for Radio (FM) Systems or for Portable Hearing Loop	
- External Boundary Loop Microphone for Portable Hearing Loop or FM systems. It comes usualy with a 3m lead and a 3.5mm jack plug.	
URL: https://www.actiononhearingloss.org.uk/shop/external-boundary-microphone--product-pl13a.aspx (Warning - this on the picture is for Ezee Loop only!)	Price: 40 EUR

Progression of Accessibility Centres in higher Education for Students with disabilities in North Africa
Project Number: 585901-EPP-1-2017-1-UK-EPPKA2-CBHE-JP

http://pacesproject.eu
pacesswdproject@gmail.com

27

Hearing loops (induction T-coils loop) for rooms	
- "induction loop" systems--which magnetically transmit sound to hearing aids and cochlear implants with telecoils (T-coils)	
URL: http://www.hearingloop.org/	Price: 500 EUR – 4.000 EUR

Portable Hearing loops (induction T-coils loop) for personal use	
- Portable "induction loop" systems --which magnetically transmit sound to hearing aids and cochlear implants with telecoils (T-coils).	
URL: https://www.actiononhearingloss.org.uk/shop/loophear-101-portable-hearing-loop-system-product-l412.aspx	Price: Cca. 200 EUR

CATEGORY 6: HD Video cameras, web video cameras, wirelless microphones

Pan-Tilt-Zoom Camera	
• 2 Mega Pixels • HD 1080P video • Pant-Tilt-Zoom	
URL: http://www.ecvv.com/product/3086177.html	Price: 1.000 EUR

Web Camera	
• Full HD • USB 3.0 • Zoom	
URL: http://www.logitech.com/en-us/webcam-communications/webcams	Price: 100 EUR

Progression of Accessibility Centres in higher Education for Students with disabilities in North Africa
Project Number: 585901-EPP-1-2017-1-UK-EPPKA2-CBHE-JP

http://pacesproject.eu
pacesswdproject@gmail.com

29

Wireless microphones	
• Carrier frequency range : 500-900MHz,UHF high band ,Frequency stability : ±0.005%. Modulation Mode: FM ,Maximum deviation range : ±15KHz, Frequency response 40Hz - 20KHz ,S/N ratio : >1OOdB. Audio dynamic range: >1OOdB. ,T.H.D: ≤0.5% ,Service areas: 80-100 meters.(in the best conditions)	
URL: http://www.hisonic.net/HSU8900L.htm	Price: 150 EUR - 500 EUR

CATEGORY 7: Steno writer for subtitling

Subtitling system	
System for live subtitling. Sound from the talk person is transmitted to the typist situated in the same room or at the distance.	
	Price: Up to 2.000 EUR without all necessary equipment (video camera, Headset, 2x microphone, 2x laptops)

Progression of Accessibility Centres in higher Education for Students with disabilities in North Africa
Project Number: 585901-EPP-1-2017-1-UK-EPPKA2-CBHE-JP

http://pacesproject.eu
pacesswdproject@gmail.com

30

CATEGORY 8: LCD Large screen television

TV Display

Video projector	
• Carrier frequency range : 500-short throw DLP, Zoom fixed,3000 Lumens, XGA(1024X768), 1 x S-Video, 1 x Component (via D-sub 15-pin), 1 x HDMI,1 x D-sub 15-Pin (RGB), 1 x USB 2.0 type B	
URL: http://www.techcrok.com/factors-to-consider-while-purchasing-a-video-projector/	Price: 700 EUR

Portable Mixer with speakers	
• 175w, Inputs: Nine - (Three XLR, Five 1/4", One Stereo 1/8"),Line Out: One - (1/8" Stereo with Level Control)	
URL: http://www.hifisoundconnection.com/American-DJ-PPA210-Portable-Sound-System-2x-10-Speakers-Mixer-PPA210	Price: 500 EUR

Soundspeakers	
• 5 x 40 W • with wire • SNR 85dB	
	Price: 1000 EUR

Progression of Accessibility Centres in higher Education for
Students with disabilities in North Africa

Co-funded by the
Erasmus+ Programme
of the European Union

CATEGORY 9: Multipoint videoconference system

Professional Multipoint videoconference systems	
Videoconference system (RADVISION) for: - Telepresence - Room Based Video Conferencing systems - Desktop Video Conferencing - Mobile Platform support (iOS on iPad/iPhone, Android due Q3 2012) - Infrastructure products – multipoint, gateways and firewall traversal	
URL: http://www.iqsys.co.uk/products-and-services/audio-and-visual/video-conferencing	Price: From 3.000 EUR to 10.000 EUR (RADVISION, TANDBERG)

Progression of Accessibility Centres in higher Education for Students with disabilities
in North Africa
Project Number: 585901-EPP-1-2017-1-UK-EPPKA2-CBHE-JP

http://pacesproject.eu
pacesswdproject@gmail.com

33

Skype Multipoint videoconference systems	
The Skype free account allows person to person video calls. WARNING: up to 10 people with Premium Skype account.	
URL: https://www.skype.com/en/business/collaborate/	Price: Up to 1.000 EUR with all necessary equipment (video camera, microphone)

CATEGORY 10: Web conferencing and collaboration software

Adobe Connect	
Adobe Connect web conferencing software service offers immersive online meeting experiences for collaboration, virtual classrooms and large scale webinars. It offers also live captioning.	
URL: http://www.adobe.com/products/adobeconnect.html	Price: Up to ??? EUR with all necessary equipment (video camera, microphone, projector)

![PACES - Progression of Accessibility Centres in higher Education for Students with disabilities in North Africa](logo)

Co-funded by the
Erasmus+ Programme
of the European Union

CATEGORY 11: Voice recording tools

Digital voice recorder	
Voice recorder developed for blind people who like to record some notes anywhere they go. All features are supported with a voice guide, using high quality syntethic voice. It is possbile to easily operate the recorder without any need for help of a sighted person.	
URL: http://www.talking-recorder.com/	Price: cca. 180,00 EUR

Progression of Accessibility Centres in higher Education for Students with disabilities in North Africa
Project Number: 585901-EPP-1-2017-1-UK-EPPKA2-CBHE-JP

http://pacesproject.eu
pacesswdproject@gmail.com

35

REFERENCES

[1] Welsh, E. T., Wanberg, C. R., Brown, K. G. and Simmering, M. J. (2003), E-learning: emerging uses, empirical results and future directions. International *Journal of Training and Development*, 7: 245–258

[2] WHO. (2011). World report on disability. Available on:http://www.who.int/disabilities/world_report/2011/report/en/

[3] MIPIE Report by European Agency for Development in Special Needs Education. (2011). Available on: https://www.european-agency.org/sites/default/files/MIPIE-Report.pdf

[4] ITU: Guide for addressing accessibility in standards, Guide 71, Second edition, 2014-12-01. Available on: http://www.itu.int/en/ITU-T/accessibility/Pages/default.aspx

[5] M. Debevc, D. Milošević, and I. Kožuh, Ines. A comparison of comprehension processes in sign language interpreter videos with or without captions. PloS one, 2015, pp. 1–10.

[6] Guillaume Jean-Louis Olivrin. Is video on the web fro sign languages? *Meraka Institute, CSIR, W3C Video on the Web Workshop*, San Jose, California and Brussels, Belgium, 2007. https://www.w3.org/2007/08/video/positions/Meraka.pdf

[7] SLI Player. 2015. Available on: http://slimodule.com/publications.html

[8] Seale Jane. The development of accessibility practices in e learning: an exploration of communities of practice. ALT-J, *Reseacrh in Learning Technology*, 12(10), 2004, pp. 51-63

[9] AccessWorld Magazine: https://www.afb.org/aw/accessworld.aspx

Progression of Accessibility Centres in higher Education for Students with disabilities in North Africa
Project Number: 585901-EPP-1-2017-1-UK-EPPKA2-CBHE-JP

http://pacesproject.eu
pacesswdproject@gmail.com

36

ANNEX A1: Used Data From WP1 Online Survey

All collected data is divided according to the questions:

1. What is the name of your university?	11. How many computers in your university are accessible to students with disabilities? (for example, have large keyboards, screen readers, joysticks or trackballs)
Arab Academy for Science, Technology, and Maritime Transport	They are few and not available in all campuses, yet software that helps visually impaired learners is available. [10-20] [20]
Ain Shams University	10 computers in the centre for visually impaired
Fayoum University	5 computers
Mansoura University	The available computers are ordinary ones and not qualified for disabled students. Students bring their personal lab tops. So, there are no specified number of assistive technologies in our university.
Abdelmalek Essaadi University	9
Ibn Tofail University	10
Mohammed V University of Rabat	In the resource centre, there are 3 PCs with software, a Braille printer and devices for the deaf.
University of Moulay Ismail	3

1. What is the name of your university?	12. Please use the list below to show the accessibility tools which are available to your students:	12.a. If you selected Other, please give details.
Arab Academy for Science, Technology, and Maritime Transport	Screen reader, Screen magnifier, Braille printer [Digital audio recorder, large keyboard, Speech-to-text input software]	
Ain Shams University	Large keyboard, Speech-to-text input software, Braille printer	
Fayoum University	Braille printer	
Mansoura University	Braille keyboard, Braille printer, Digital audio recorder	
Abdelmalek Essaadi University	Large keyboard, Joystick, Screen reader, Screen magnifier, Speech-to-text input software, Braille keyboard, Braille printer, Digital audio recorder, Video recorder, Other	Dragon Naturally speaking Laptops
Ibn Tofail University	Large keyboard, Screen reader, Screen magnifier, Speech-to-text input software, Braille keyboard, Braille printer, Digital audio recorder, Video recorder	
Mohammed V University of Rabat	Speech-to-text input software, Braille printer	3 PC with Logitech and device for the deaf
University of Moulay Ismail	Braille keyboard, Braille printer, Other	hearing aid

1. What is the name of your university?	13. Do you provide assistive hardware to students with disabilities?	13.a. Any additional information:
Arab Academy for Science, Technology, and Maritime Transport	No [Yes]	Some students come to class with their own assistive hardware.
Ain Shams University	No	
Fayoum University	Yes	
Mansoura University	No	Each student with visual impairment (blind or other) is provided with a digital recorder.
Abdelmalek Essaadi University	Yes	
Ibn Tofail University	No	students can use the assistive technology available at the accessibility centre.
Mohammed V University of Rabat	Yes	We are building partnerships with organizations that can provide us with technological equipment
University of Moulay Ismail	No	

1. What is the name of your university?	14. Who provides support and maintenance for the assistive technology at your university?

Arab Academy for Science, Technology, and Maritime Transport	Computer engineers and computer lab technicians. [Informatics Center] [Teaching assistants]
Ain Shams University	Maintenance unit of the university paid for through a specific budget line for maintenance for all university hardware
Fayoum University	University Employee
Mansoura University	no one. this service is not provided
Abdelmalek Essaadi University	Thanks to the SWING project, we have created an accessibility centre equipped with the necessary IT that suits our students' needs There is also a room in the Library of the Faculty of Letters equipped with computers designed to facilitate research for students
Ibn Tofail University	The university's technical staff
Mohammed V University of Rabat	The University uses a blind computer engineer
University of Moulay Ismail	Technicians were trained in the RUMI project for the equipment described in Question 12.

PACES

Progression of Accessibility Centres in higher Education for
Students with disabilities in North Africa

Co-funded by the
Erasmus+ Programme
of the European Union

1. What is the name of your university?	15. Does your university use a LMS or VLE such as Moodle or Blackboard?	15.a. Is your LMS/VLE accessible for students with disabilities? (for example, can a student change the font size or colours on screen, can it be used with a screen reader)
Arab Academy for Science, Technology, and Maritime Transport	Yes	Mostly no [It is mostly accessible for people with visual disability, but mostly no for low vision people]
Ain Shams University	Yes	Moodle. Not accessible for student with disabilities
Fayoum University	No	
Mansoura University	No	
Abdelmalek Essaadi University	Yes	Yes, Moodle is an available learning management system widely used by students with disabilities
Ibn Tofail University	Yes	no
Mohammed V University of Rabat	Yes	No
University of Moulay Ismail	No	

ANNEX A2: List Of Available Equipment At Partnered Universities

Equipment title	Arab Academy for Science, Technology, and Maritime Transport	Ain Shams University	Fayoum University	Mansoura University
Screen reader for blind and partially sighted	yes (software that helps visually impaired learners is available)			
Screen magnification and screen reading	yes			
"LCD – Desktop Electronic Book Magnifier for Low Vision"				
Braille displayer				
Smartphone for blind and partially sighted				
Handheld magnifier				
Braille printer	yes	yes	yes	yes

Sign Language Interpreter Video Module for Web				
Real-time captioning/subtitling system				
"Webinar and videoconferencing system - computer hardware "	Cisco videoconferencing unit supports multi-point communication, 622 Mbps connections			
Webinar and videoconferencing system	Cisco			
Induction hearing loops - mobile version				
Personal FM system				
Portable laptop	Computers: They are few and not available in all campuses	10 computers in the centre for visually impaired	5 comptuers	ordinary ones and not qualified for disabled students
Large screen TV				
Webcam				

Portable speakers with mixer				
Portable microphone set				
Aditional				
Digital audio recorder	Digital audio recorder			digital audio recorder
large keyboard	large keyboard	Large keyboard		
Speech-to-text input software	Speech-to-text input software	Speech-to-text input software		
joystick				
Braille keyboard				Braille keyboard
Video recorder				
Dragon Naturally speaking Laptops				
Devices for deaf				

Equipment title	Abdelmalek Essaadi University	Ibn Tofail University	Mohammed V University of Rabat	University of Moulay Ismail
Screen reader for blind and partially sighted	yes	yes		
Screen magnification and screen reading	yes	yes		
"LCD – Desktop Electronic Book Magnifier for Low Vision"				
Braille displayer				
Smartphone for blind and partially sighted				
Handheld magnifier				
Braille printer	yes	yes	yes	yes
Sign Language Interpreter Video Module for Web				
Real-time captioning/subtitling system				

"Webinar and videoconferencing system - computer hardware "				
Webinar and videoconferencing system				
Induction hearing loops - mobile version				
Personal FM system				
Portable laptop	9 computers	10 computers	3 computers (sw: logiciel)	3 computers
Large screen TV				
Webcam				
Portable speakers with mixer				
Portable microphone set				
Aditional				
Digital audio recorder	digital audio recorder	digital audio recorder		
large keyboard	Large keyboard	Large keyboard		

Progression of Accessibility Centres in higher Education for Students with disabilities in North Africa
Project Number: 585901-EPP-1-2017-1-UK-EPPKA2-CBHE-JP

http://pacesproject.eu
pacesswdproject@gmail.com

![PACES - Progression of Accessibility Centres in higher Education for Students with disabilities in North Africa]

Co-funded by the
Erasmus+ Programme
of the European Union

Speech-to-text input software	Speech-to-text input software	Speech-to-text input software	Speech-to-text input software	
joystick	joystick			
Braille keyboard	Braille keyboard	Braille keyboard		braile keyboard
Video recorder	Video recorder	Video recorder		
Dragon Naturally speaking Laptops	Dragon Naturally speaking Laptops			
Devices for deaf			Devices for deaf	hearing aid

ANNEX B: Best practice examples – Accessibility centres

Author: Peter Čakš, Dr. Matjaž Debevc (University of Maribor, Slovenia)

Rang	Name	URL Link	Comment
1.	University of Leicester – AccessAbility Centre, USA	https://www2.le.ac.uk/offices/accessability	Best
2.	BYU – University Accessibility Center, USA	https://uac.byu.edu/	Very good
3.	Auburn University – Office of Accessibility, USA	https://accessibility.auburn.edu/	Integration into society
4.	Santa Monica College – Disability Resources, USA	http://www.smc.edu/StudentServices/DisabilityResources/Pages/Mission.aspx	Very good with wide range of services
5.	Harvard University – University Disability Services, USA	https://accessibility.harvard.edu/	Soft approach, fewer content

6.	Kenyon College – Students Accessibility and Support Services, USA	http://www.kenyon.edu/directories/offices-services/student-accessibility-support-services/	Very good with a little less variety of services
7.	University of Florida – Disability Resource Center, USA	https://drc.dso.ufl.edu/services/assistive-technology/	Soft approach, disability centre in library
8.	University of Zürich, CH	http://www.disabilityoffice.uzh.ch/de/information/university/accessibility/information.html	Good info on services
9.	San Diego State University – Students Disability Services, USA	http://go.sdsu.edu/student_affairs/sds/htc.aspx#	Average services and content
10.	University of Oregon – Accessible Education Center, USA	https://aec.uoregon.edu/	Only soft approach, very poor in infrastructure
11.	Utah Valley University – Office of Accessibility Services, USA	https://www.uvu.edu/accessibility/	Only basic content

ANNEX C: Rank list of the analysed accessibility centres

University of Leicester – AccessAbility Centre   1.

https://www2.le.ac.uk/offices/accessability

BYU – University Accessibility Center   2.

https://uac.byu.edu/

Auburn University – Office of Accessibility   3.

https://accessibility.auburn.edu/

University of Florida – Disability Resource Center   4.

https://drc.dso.ufl.edu/services/assistive-technology/

San Diego State University – Students Disability Services   5.

http://go.sdsu.edu/student_affairs/sds/htc.aspx#

6. Kenyon College – Students Accessibility and
Support Services

http://www.kenyon.edu/directories/offices-services/student-accessibility-support-services/

7. University of Oregon – Accessible Education
Center

https://aec.uoregon.edu/

8. Harvard University – University Disability
Services

https://accessibility.harvard.edu/

9. Santa Monica College – Disability Resources

http://www.smc.edu/StudentServices/DisabilityResources/Pages/Mission.aspx