INNOVATION AND SOCIAL LEARNING IN HIGHER EDUCATION INSTITUTIONS

ISOLearn for Higher Education Institutions (ERASMUS+)

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PART I – INTRODUCTION

Aim of this handbook

This handbook should work by its own to reach the main expected impacts for this project which are:

1. To increase access of visual and hearing-impaired persons to HE courses in the countries of each partner involved;
2. To guarantee better rates of success of visual and hearing-impaired persons in their HE courses within the country of each partner involved;
3. To facilitate, at a national level first, and at European level in a later stage, the adequate development of HE courses in order to better serve visual and hearing-impaired persons, by promoting the exchange of good practices among different European countries on the pedagogical methodologies to use on HE courses offered to visual and hearing-impaired persons;
4. To promote the exchange of good practices among different HEI of each country, for the development of HE courses in order to better serve the target audience guaranteeing at the same time the level of quality of HE courses at a National and a European level in order to serve adequately the visual and hearing-impaired persons;
5. To improve the coordination of European and National policies in terms of improved access to HE from the target population for this project.
6. To promote virtual and/or physical mobility of visual and hearing-impaired persons within the European higher education system;
7. To increase awareness of ICT companies, HEI, and Associations dedicated to visual and hearing-impaired persons, about the need for a closer cooperation in order to better serve the target population of this project. Go back to index

A brief note on inclusive education

Inclusive education of persons with disabilities is often framed in terms of human rights or justice. Notwithstanding, the economic argument for educating persons with disabilities is also very strong. Lack of adequate education remains the key risk factor for poverty and exclusion of any person, whether they are disabled or nondisabled.

One of the key Europe 2020 targets is to have 'at least 20 million fewer people in or at risk of poverty and social exclusion'. This shows the great importance social inclusion has at European level and thus for the Member States and at the same time, it demonstrates the strong need for trans-national cooperation and an integrated approach and measures for promoting and supporting social inclusion Europe wide. The number of people at risk of poverty or social exclusion in the EU amounts to nearly one-fourth of the total population. Current levels of poverty and social exclusion jeopardise the achievement of the EU 2020 headline target (Social policy reforms for growth and cohesion: Review of recent structural reforms 2013, European Commission).

Moreover, another Europe 2020 target is: 'at least 40% of 30-34-year-olds completing third level education'. It indicates the need for a highly skilled labour force at European level and at the same time, it is based on a limited level of tertiary education among 30-34 year-old European citizens (in 2013 the European average was 36,8% with only 29,2% in Portugal and 22,4% in Italy).

These practical very specific targets are in line with the UN Convention on the Rights of Persons with Disabilities which states that 'States Parties recognize the right of persons with disabilities to education. With a view to realizing this right without discrimination and on the basis of equal opportunity, States Parties shall ensure an inclusive education system at all levels and lifelong learning' (UNITED NATIONS, 2006).

The concept of "digital Divide" denotes that there is a disparity in terms of access to the information highway and subsequent use of ICT. Most measures related to digital divide relate to equipment and access to the internet. But, digital divide is a multidimensional phenomenon which includes many different drawbacks. Several of them – and very

important ones – derive from a specific mind set in essence, so education and training are the best strategies to prevent these problems. Some of them, like lack of trust or lack of motivation belong to the user side, but there are also barriers included in the production of the ICT based learning systems, like formal approaches, non-adaptive technologies, and lack of meaningful context and generalist methodologies which do not pay proper attention to the social and cultural contexts.

Reaching out to disadvantaged people represents a smart, inclusive and sustainable investment for Europe. Expanding access to higher education can open up new possibilities for active inclusion and enhanced social participation, especially for the low skilled, the unemployed, people with special needs, the elderly and migrants. In order to reach these people and to improve their conditions effectively, it is important to combine both quality of education, at all levels, and universal accessibility to knowledge.

Therefore, we need to acknowledge the relevance of an accurate definition of the concept of 'inclusion', especially within education. While traditionally students with a diversity of needs who were studying the same subjects in the same classroom were considered included per se, notwithstanding the concepts of 'inclusion' which coexisted, this is not what we consider an effective inclusion for the purpose of this handbook.

An effective inclusion, encompassing the aforesaid 'universal accessibility to knowledge', does not refer solely to the needs of people with special needs which usually implies we are only considering disabled people, but goes far beyond this population. The aim should be to effectively include all learners or potential learners taking into consideration the differing needs at all levels of decision. Only when the learner's needs to full accessibility are met will s/he truly feel included. An inclusive education empowers the learners by making them a part of the process of decision making regarding their needs to accessibility.

An inclusive education should therefore be an important part of the vision and ethos of the education establishment. It should pervade all levels of decision and the whole process of teaching and learning, from the course design to the practicalities of classroom management, day-to-day teaching, resources available and the evaluation cycle. The needs of a student may not be limited to what happens in the classroom to achieve success. Other services, contact persons who are aware of the varied students' needs and accessibility in general should be considered throughout the institution.

Although it may seem a utopian vision of inclusion, we should have high standards towards which we shall aim, by realising where we stand and taking one step at a time in a well-thought-of path towards our goal.

As higher education has made deliberate strides in recent decades to become more inclusive and accessible, the number of students from non-traditional backgrounds has increased dramatically. There has been much study of the effects of higher education on previously underserved populations, showing that it can lead to higher lifetime income and higher status. But there has been little research on what happens to those students once they are in a university. The main finding is that, taken as a whole, the EU-27 has shown wide divergences in the level of equity of HE systems, a fact confirmed consistently by several studies in the field (Evolving Diversity, MENON Network, 2010).

In this ISOLearn Handbook we propose to describe how ICT based learning instruments and tools should be designed and delivered to support higher levels of inclusion of visual or hearing impaired students in Higher Education. Moreover it should be considered as a first step towards supporting and allowing the testing of the initially proposed ISOLearn Assessment that will try to measure the level of compliance and provide feed-back regarding the adequacy of Higher Education offers to the special needs of visually and hearing impaired persons. Thus, one of the conclusions to propose will be a checklist to implement this assessment. Go back to index

1.1. Different types of deafness

More and more deaf students are accessing higher education throughout Europe. Many find themselves in a situation less than adequate as higher education institutions in general do not conceive of the idea that a deaf person might want or indeed apply successfully to study at this level. Whenever HEI decision makers consider whether their institution is in some way inclusive, what comes to mind is mainly related to physical barriers. There are of course exceptions to this and variations in the way HEI respond to these students' needs in different European countries.

Deaf students who have been a part of the deaf community and had the benefit of a bilingual education at some level during their upbringing and prior studies are generally

well-adjusted and consider themselves as part of a linguistic and cultural minority, while interacting at all levels with the mainstream society, which is at present multicultural in most European countries.

The country's sign language is the fully accessible natural language for a deaf child who relies on visual stimulus to communicate, understand and be understood from an early age. Sign language is a fully fledged language with a structure which follows visual principles adequate to the thought process of the deaf person. Rather than focusing on what the child cannot do, i.e. hear, by forcing the child to pay attention to scattered auditory stimulus which is virtually inaccessible, thus undermining the natural development of the child at all levels, early acquisition of the country's sign language by relatives and by the child, helps the child bond and understand the world around him/her, thus being able to go through the same linguistic, emotional and social stages as their hearing peers. The child has a language in which to think and make sense of the world.

Learning the country's other language(s) follows this established linguistic base, if the proper methods are used, taking in consideration that in its oral form it is not a fully accessible natural language, as it relies on sound. The written form of the language is much more accessible, as it relies on visual stimulus which can be explained through sign language.

The competence in the written language varies due to different factors, such as the existing of an early language base to rely on, the methods used to teach the written language throughout the student's prior studies among other issues.

This deaf person relies on sign language for full access to lectures, participation in debates in class and presentations, and, as such, a qualified sign language interpreter is required for full accessibility to what is being said.

There are other deaf people who have not acquired sign language during their upbringing, either due to lack of access or the educational choices of parents and teachers. These deaf people will not understand an interpreter and will rely more on written material to have some level of access to what is being taught.

For both these groups, visually appealing materials which illustrate the points covered, a written summary of the main points in a lecture or discussion on the board and written

materials provided beforehand are essential to the student's learning process. The lecturer should keep in mind that a deaf student cannot focus on an interpreter or lip-read what someone is saying for long periods of time, which is uncomfortable for the eyes. Being able to access information through different media provides something else for the student to focus his/her eyes on, provided the viewing and the explanation do not occur simultaneously.

On the other hand, there are deaf people who have enough residual hearing to benefit from hearing assistive devices such as FM systems and may find them a useful asset in a classroom setting. However, the fact that a deaf student has a hearing-aid should not lead to the conclusion that no further steps are needed as 'the student can hear'. This is far from the truth as even for a deaf student with enough hearing to understand the human voice, in a noisy background or in a class debate the student will still not be able to understand what is being said. Lip-reading, although useful to a certain extent, makes only part of what is being said accessible and is not enough for full access.

Some deaf people speak orally, some do not. Some use hearing aids, even if only for environmental sounds, some do not. Many use and/or prefer sign language regardless of their hearing levels or speech abilities. Some will feel the need to have an FM system and a sign language interpreter. Some will not.

To sum up, while the university, its courses, and ICT based or other materials should be designed having the needs of deaf people in mind, providing the lecturers with information regarding the needs of deaf students, as well as other personnel, each deaf student should be regarded as an individual, and resources should be adequate to the student's needs and/or preferences. Go back to index

1.2. Different types of blindness

Definitions of blindness and partial sight may vary slightly from one European country to another, but a good guide is the classification used by the World Health Organisation (WHO) http://www.who.int/mediacentre/factsheets/fs282/en/.

Under the International Classification of Diseases -10 (2006) there are 4 levels of visual function:

1. normal vision,
2. moderate visual impairment,
3. severe visual impairment,
4. blindness.

It should be noted that a person may be considered blind for medical and other purposes (some countries use the expression "legally blind") without being totally blind, for example, he/she may be able to see the shape of objects and notice if the lights are on indoors. The categories moderate visual impairment and severe visual impairment are often grouped together under the term partially sight. It is a broad term used to refer to degrees of vision loss that affect a person's ability to perform day-to-day activities. However, that loss is measured after best correction, in other words it is the amount of vision loss that cannot be corrected by wearing glasses or contact lenses. Therefore, the majority of people who wear glasses or lenses are not visually impaired because the optical devices restore normal vision. On the other hand, when partial sight and blindness are taken together they are usually referred to as visual impairment. For this reason, in this handbook the expression visually impaired students (VI students) refers to students who may be blind or partially sighted. Clearly different VI students will have different needs and university teachers and staff should adapt their support accordingly.

This does not mean the teachers and staff have to be experts in visual impairment, and in any case detailed knowledge of the various pathologies will not tell us what font size and colour contrast a particular student prefers. Rather teachers and staff should seek advice from the student who is the expert in his/her needs and who has a great deal of experience of dealing with VI in educational settings. Go back to index

The ISOLearn Project in brief

Social inclusion is a very important topic worldwide and in particular in all European Union Members states. There are many declarations of intentions and strategies proposed or defined by various national, international, and European institutions about this topic and there are different policies and strategies in addressing their needs at European, national and local level. Moreover, there are different private initiatives around Europe and also in the different Partner countries.

Most of these initiatives are often linked to raising awareness, establishing collaboration and networks between various stakeholders, and provide road maps for improvement, reduce disparities by gender. In addition, many of the existing experiences refer to access to HEI of disadvantaged groups such as: students with migrant background, students with low economic resources, adult students (over 50), and mobility impaired students. There are not known studies that related the access of hearing-impaired and/or visual-impaired persons to HE.

The ISOLearn project aims to support the accessibility to the HEI innovative learning offer addressed to hearing-impaired and visually-impaired individuals in the participating countries. It defines and pilots the ISOLearn Handbook describing how ICT based learning instruments and tools should be designed and delivered for these target groups. Moreover, it will develop and test the readiness of HEI to include visual and hearing-impaired persons, possibly through a "ISOLearn Quality Label", informing about the compliance with the identified ISOLearn quality standards.

Therefore, the project addresses several needs of the specific target groups:

a) Higher opportunity for tertiary education, therefore for more specialized skills and competencies. This will contribute to increasing their employability and quality of life.

b) Socially inclusive ICT based learning offer - the aim is to design and deliver education and training programmes that can be accessed by a wide range of beneficiaries, and especially hearing - impaired and visually - impaired individuals.

c) Raise awareness on the need to enhance and value individual capacities especially from hearing - impaired and visually - impaired individuals.

The project brings together 8 partners from 4 European countries, forming a transnational cooperation partnership with a balanced regional geographical representation of the Erasmus+ area and with qualitative representation for Portugal.

Partners have worked on previous European projects aiming at enhancing education, lifelong learning and social inclusion policies and practices in the HE systems. The main themes where Partners are experienced are: education, working with disadvantaged groups, definition of professional qualifications in line with the European lifelong learning instruments (EQF, ECVET and EQAVET), validation of prior learning, validation of non-formal and informal learning, certification, and quality assurance.

A general study conducted by ACAPO (PT) in 2012, concluded that access to education is by far the most important social propriety to increase the participation of visual-impaired persons in employment (ACAPO, 2012, p. 28), and we can generalize this conclusion to the hearing-impaired persons.

The 2013 Communication from the Commission suggests that "In addition to broadening access to education, wider use of new technology (…) can contribute to alleviating costs for educational institutions and for students, especially among disadvantaged groups. This requires, however, sustained investment in educational infrastructures and human resources. Emerging technologies present clear challenges, but also huge opportunities for widening access and participation in inclusive education. These are in line with the call from the European Union (EU) to allow: 'All individuals to learn, Anywhere, Anytime, through any device, with the support of anyone' (European Commission, 2013a, p. 3).

While motor disabilities may be solved "easily" through distance learning services, and increase in physical accessibility features, other disabilities, such as blindness or deafness, need specific design, compliance to standards and technological capabilities to be overcome.

There is a lack of studies regarding the gaps and needs of hearing-impaired and visually-impaired individuals. When they exist they often miss the direct opinion of blind and deaf persons, either because of the huge attention they usually get from media, or from an

opposite point of view, because they really don't like to call the attention to them. However, it is widely recognised that these individuals have to face discrimination and disadvantage in their possibilities in education and do not have equal opportunities in social and public life. Rehabilitation systems are still fragile in terms of functional dependency prevention, qualification promotion and employment integration.

Even for employed individuals with these type of disabilities, there are still many limitations like the inadequacy of equipment and the disrespect for their condition by colleagues and superiors. During their academic life, the main causes of education withdrawal are usually the lack of specialized support, their low economic resources and the lack of teacher skills directed to their learning needs.

This is paradoxical, since in the education system, broadly considered, students are normally protected by law against discrimination, but in Higher Education these laws do not directly apply or regulate the system, and there is no process aimed at achieving success.

We observe that there is also a lack of adequate educational guidance for hearing-impaired and visually-impaired individuals, in terms of education in general and also for vocational education. Aptitude test procedures being used in counselling settings are only available in written language but most of hearing-impaired individuals have difficulties in understanding written language.

There is generally a lack of test procedures including sign language and audio-description with the result that these individuals are hardly able to choose from the wide range of educational offers for lifelong learning and higher education. Some of the audio-description guidelines that exist are not universally accepted, and in many areas there are no guidelines.

Considering the existing experiences and the concrete needs of the hearing - impaired and visually - impaired groups for accessing HEI programmes, we consider that the ISOLearn project brings some important innovations:

1. A functional approach translated into this Handbook, proposing the methods and procedures to be used for developing and delivering ICT based learning offers valid also for these target groups (not specially done for them, but designed in such a way

that correspond also to their specific needs). This is what will support the target groups in their education and also social inclusion.

2. A subsequent proposal of a kind of assessment procedure to analyse and develop the inclusion stage and development processes to reach a kind of a "Quality Label", thus establishing quality standards and assessment procedures and instruments to be used for evaluating whether Higher Educational Institutions' offers and training programmes correspond to the ISOLearn standards regarding the accessibility of these groups to their learning offer.

3. Both the Handbook and the assessment methodology ("Quality Label") should be tested on offered courses and on a specific qualification to be proposed especially for this project, which should become a benchmark for the HEI ICT based learning programmes. The concrete experience will demonstrate the benefits for all the stakeholders (e.g. HEI and disadvantaged groups) of promoting social learning approach in HEI.

The main expected impacts for this project should then be the following:

1. To facilitate, at a national and European level, the adequate development of HE courses in order to better serve visual and hearing-impaired persons' needs;

2. To increase access of visual and hearing-impaired persons to HE courses in the countries of each partner involved (and generally in EU);

3. To guarantee better rates of success of visual and hearing-impaired persons in their HE courses within the country of each partner involved;

4. To promote the exchange of good practices among different HEI of each country, for the development of HE courses in order to better serve the target audience;

5. To increase awareness of ICT companies, HEI, and Associations dedicated to visual and hearing-impaired persons, about the need for a closer cooperation in order to better serve the target population of this project.

6. To promote the exchange of good practices among different European countries on the pedagogical methodologies to use on HE courses offered to visual and hearing-impaired persons;

7. To guarantee the level of quality of HE courses at a National and a European level in order to serve adequately the visual and hearing-impaired persons;

8. To promote virtual and/or physical mobility of visual and hearing-impaired persons within the European higher education system;

9. To improve the coordination of European and National policies in terms of improved access to HE from the target population for this project.

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Main stakeholders to involve: audience for this handbook

Besides the needed involvement of the professors and other academic staff in any course deliver, there are (or can be) involved a set of stakeholders that can promote students' accessibility and the framework for their success.

In order to pursue the project's goals, the main target audiences to be considered should involve the following agents of the system:

1. National and regional associations of hearing-impaired and visually-impaired individuals;
2. European networks of hearing-impaired and visually-impaired individuals;
3. Universities;
4. National and European public authorities responsible for conception, implementation and evaluation of policies directed to target individuals;
5. Research centres involved in the development of software and hardware to support Learning processes of hearing and visual impaired students;
6. Media and editors producing audio, video, or written pedagogical materials that can be used for Learning purposes of visual and hearing impaired students;
7. Target individuals;
8. Top managers and departments of partner institutions which integrate the project.

Target audiences should promote network development through a possible "virtual team" created within the project's website. Go back to index

Technology-enhanced Learning: definition and scope

1.1. Scope and basic principles

The present Handbook aims to describe how ICT-based learning instruments and tools should be designed and delivered to promote inclusion of visual and hearing-impaired students in Higher Education. This is a functional approach that will support the target groups in their education and also social inclusion.

This proposal is based on the main guidelines and tools that should be used for designing and delivering ICT- based learning programmes for the target population of the project, identification of main stakeholders, and expected impacts and benefits. At the same time, these guidelines and tools can be used to develop traditional face-to-face higher education courses that, to be offered to visual and hearing impaired students must also be based on technology enhanced features.

Our proposal supports that in order to achieve the desired goals, it is important that the proposed methods and tools embrace the whole process of creating, developing, offering and evaluating a course offer. This will make that we cover aspects from the initial organisation to the proper course deliver and evaluation, ending on the improvement processes.

By supporting the need to enlarge the concept of digital capital (Seale et al., 2015) to the inclusion of disabled students (and particular those with visual or hearing impairments), we argue about the need to develop the concept of universal design (Burgstahler, 2012) to all stages of courses' development, whether its offer will be traditional face-to-face, or in e-learning mode.

So, the target population of this handbook should go far beyond the ultimate target group of our project (i.e. the visual and hearing impaired persons). To be effective, these proposals should also cover Higher Education Institutions and the overall academic communities, comprising professors, staff dealing with these students, and also other students without disabilities and families of the disabled students involved, Associations

representing the target population of students; as well as public authorities with direct responsibilities in Education and Disabilities; and even the Quality Agencies and Accreditation bodies.

In operational terms we can classify these target groups as follows:

1. Ultimate target: visual and hearing impaired persons;
2. Main or Direct Target: Higher Education Institutions' responsible, professors, staff, and overall academic community;
3. Instrumental Target: Quality, Accreditation and Public Organisations dedicated to the target population, here included also the Associations that represent the visual and hearing impaired students, and also software and hardware companies dedicated to these issues.

Ultimately we truly expect to support the change of mentalities towards a faster development of policies for inclusion of visual and hearing-impaired persons in Higher Education, as per clear definition of the possible impacts and benefits to expect from this Handbook and of our project. Go back to index

1.2. Learning in today's world

Everybody in today's world is learning through the use of new technologies in what is called by some authors, "*the second education revolution*". To understand this, one must forget the concept of schooling to arrive to the concept of education, whereas "schooling is generally from 5 to 18 or 21 but education should be considered a lifelong enterprise. And (…) even when students are in schools, most of its education happens outside of school" (Collins and Halverson, 2010).

Technology developments have positioned e-learning into the eye of the storm when we talk about education. And, giving the success reached by several Distance Learning (DL) institutions all over the world, e-learning has proved its reliability and effectiveness in the mainstream education and training field and in providing universal quality online education and professional training (In http://www.elearninginabox.com/component/content/article/3-articles/9).

E-learning has followed the traditional Distance Learning (DL) capabilities, having added to the traditional way of delivering DL courses, the technology. Not just that associated with the internet but also other forms of technology manifestation, linked to the development of different learning tools (from electronic data support devices like CD Rom or DVD, or audio, video and interactive software).

This means that, the key promise of DL to make possible for an individual to learn outside the traditional boundaries of a classroom, has now reached a new level of potentialities, which go well beyond the physical constraints associated with the traditional teaching-learning process. This is also changing in today's world, where the development of online social networks – where places become (virtual) spaces – is even breaking the limits of the physical social interactions, virtually eliminating distance, even if two persons are physically in different places.

More than just the course delivering, the "e" that was added to the "learning", replaced the traditional manuals or Video Tapes to deliver contents through electronic means, serving as a powerful communication tool. This has meant a total revolution in the way courses must be conceived, the materials should be thought and designed, and the courses should be delivered (both pedagogically and also scientifically) and even evaluated. And this represents a crucial opportunity for disabled people to access Higher Education, as we'll support during the next chapters.

Besides the clarification of the e-learning concept (or, more broadly, the so-called Technology-enhanced learning) and its implications for our day life, the aim of this contribution is to present the main steps involved in an e-learning course offer (which can be easily exported to a traditional face-to-face course offer). Go back to index

1.3. TEL – Technology Enhanced Learning and E-Learning: concepts and methodology

In todays' world, almost all forms of learning use technology to enhance the learning process. In this sense, e-learning is a specific type of technology-enhanced learning. "*E-learning is the use of electronic media for a variety of learning purposes that range from add-on functions in conventional classrooms to full substitution for the face-to-face meetings by online encounters*" (Guri-Rosenblit, 2005). However, in e-learning, contrarily to what it happens when there is teaching aided by technology, "*technologies do not merely support learning: they transform how we learn and how we come to interpret learning*" (Säljö, 2010). In this sense, e-learning, by showing the capacity to revolutionize the teaching-learning process, positions far beyond the technology-enhanced learning process, most of the times done just through the deposit of learning materials in an e-learning platform.

These transformations that occur in e-learning can be felt at various levels and stages of the teaching-learning process, starting by the proposal of the education's offer. We can systematize the different stages of an e-learning course offer, as follows.

1.3.1. First Stage: Course conception

Course conception is related with all the previous reflection work, that learners do not see, and that consists in the course outlining. It becomes crucial for all the moments during the education process where the possible lack of synchronous communication – either between teacher and learner or even between learners – can hinder learners' performance and affect its motivation.

The course conception stage is related with the course outline, comprising its structure's definition, the clear definition of tasks to be performed by learners during the course duration, its type and duration, as well as the types of evaluation to be made by learners.

Course conception is invisible to the learners, but it is crucial for a course's success and for the teacher. Here many principles are taken that later will affect the accessibility levels of the course, namely for disabled students.

Every course conception must be defined according to the type of scientific contents and the most appropriate methods to deliver them online, and also with learners' skills and motivations.

In an e-learning course, situations are very different from what usually happens in the traditional classroom teaching. Once students are not usually at the arms-length of the teacher, all the course materials and design must be prepared well before the course is launched, in order to allow all the logistics to perform is job before the course starts.

Also, the course preparation must be adapted to the learners' conditions and capacities to deal with ICT and their specific needs on that subject.

1.3.2. Second Stage: Pedagogical construction of the materials and related contents

The second stage of a course development consists on the definition of materials to be available on the web pages or the Learning Management System to support pedagogical intended processes, and the level of interactivity and detail that these materials should present in order to fulfil the pedagogical objectives.

A crucial feature in this phase is the course's page layout, something that sometimes is made with the help of a web designer.

Teachers must be well aware of the importance of pages' layout, the advantages and disadvantages on the use of images on the web – giving download speed and correspondent time to see the images access and comprehend them - and of the friendliness of the materials delivered to work online. Also, professors must be aware that visual or hearing impaired persons require specific characteristics on the images and/or videos to be used, that it is better to prevent from the very beginning that are available then to proceed with amendments or exceptions in a later stage of the course offer.

One must be attentive, for instance, that it is completely different to supply reading materials online, or even a digital book – making use of hypertext – instead of advising a text book or manual that will be used out of the e-learning system as additional element of study.

Also, it is crucial to define the formal evaluations (types and how they will be delivered) and general assessments to be conducted, preventing that they will be adequate for students with impairments.

Learners must feel attracted by the technology wonders but they must not lose themselves with images or technological features, forgetting contents thus, not reaching pedagogical objectives and aimed scientific knowledge. Also, materials must be fully accessible online, which means the capacity to edit files or even put subtitles in different languages, to be readable by software often used to read by hearing impaired students.

Also, it is important that all these definitions are made taking into consideration the potentialities of the platform that will be used to deliver the course.

1.3.3. Third Stage: Course delivery and logistics

Course delivery and logistics is the third step and can be divided in two main phases: the pre-deliver and the proper deliver of the course to students.

During the pre-deliver phase, the teacher must be sure that all the steps of the planning phase were executed; all the materials were displaced in the chosen platform as it was defined, and a pre-test to the functionality, workability and friendliness of the platform, and the course, as well as the accessibility of materials was assured and that be made before it is delivered to the students. Sometimes it is useful to prepare a small presentation video of the teacher, to "break the initial ice" of learners' interaction with the teacher (and tutor, if it is the case).

Moreover, there is also the need to plan rigorously the way students will have access to the platform, how do they register to access the course, the process of students' inscription to do the evaluations that are defined, and to provide some kind of helpdesk (technical, pedagogical and/or administrative) whenever it is needed.

All these things assured, it is time to start the proper deliver of the course, having for the first time, after its conception, a direct contact with the students.

At this stage, there are crucial tasks to perform. At the very beginning, it is important to promote a brief presentation of the teacher and the learners. Secondly, the teacher must give a brief explanation about the functioning of the course, something that is possible to be made through the presentation and negotiation of a learning contract.

Thirdly, it is sometimes wise to initiate the course with a light activity, where learners are invited to write, something that could be important especially for learners that are not used to work in e-learning platforms.

During this initial stage of the course deliver, it is important to be in touch with the students in order to raise awareness of any possible situation of students with some kind of impairments and special needs. If that's the case, professors must define strategies to support these students' activities, to assure them equal opportunities as to the rest of the students.

When the course is on route, teacher performs a crucial role, not just because he must explain the contents of the course, to answer to any doubts there may exist and to give the adequate feedback to each learner of its performance; but also because he has to manage the crucial moments of the training: like the launch and close of each activity; the accomplishment of the pre-defined schedule for the different tasks and activities; the "waken-up of some less active and motivated learners"; etc.

For teachers this is also a very demanding job, once it is very hard to be online – theoretically 24 hours a day –writing all their interventions, correcting and evaluating learners' works and giving all the necessary feedback, not to mention the participation in moderated forums that sometimes must be used to better accomplish pedagogic objectives, or moderating some online conversations that sometimes are not going the right/desired way.

1.3.4. Fourth Stage: Learners' evaluation / assessment

Learner's evaluation and assessment can also be considered a two-stage task on an e-learning course.

First there is the continuous evaluation that is made along the course's planned different activities. These evaluations usually consist on giving a punctuation to the different

interventions made by learners in forums launched by the teacher; to the answer of a question launched by the teacher; to a work that can be requested by the teacher, to evaluate learner's knowledge about a specific point of the course content; or even to the learner's participation on the online chat or a workgroup created by the teacher with an assigned task.

Learner's evaluation however, must be considered in the Apprenticeship Contract negotiated at the beginning of the course. Also, the criteria to do that must also be clearly defined since the beginning. This will help both learner and teacher to be more objective in their jobs, and to search the best possible performance on the programmed evaluations, something that is also crucial for the time planning of the learner himself.

1.3.5. Fifth Stage: Course evaluation

Like in all human activities, it is very difficult to manage what we do not (or cannot) measure.

The evaluation of a course or even a discipline/curricular unit, figures out as a crucial moment of a course's feedback, where learners, professors and sometimes staff involved are called to give their opinion about the course's performance and the level of the different interaction stages with the course's organizer and teachers.

These opinions, that must be clearly distinguished for all the course levels of interaction (pedagogical; scientific; usefulness of the course; administrative relationship; etc) assume a critical importance for any improvement to be made in the future delivery of the same course.

Usually, opinions are received through the use of an inquiry dully structured to capture the required information.

In order to guarantee the maximum exemption in dealing with the results, it seems very wise to do not use the people directly linked to the course to do these inquiries, making use, for that purpose, of another department of the institution or even an independent entity to that end.

1.3.6. Sixth Stage: Feed forward process

The last stage of a course delivery consists in obtaining the main results of the course's evaluation and the opinions of all those that somehow were affected by the course, and making a critical analysis of what went wrong ad what went good in the course delivery, preparing the way for a new, even stronger, future course offer. Go back to index

2. Technology to enhance students' experience in HE and promote inclusion

As previously referred, technology is changing the way students learn and professors teach. Things are being done differently than before, and technology plays a very important role in that change. With technology it becomes possible to adjust and even individualize students' needs, thus answering better to the specific needs of each student and particularly to those that were excluded from the system before (either because they didn't simply reveal to possess the minimum requirements to frequent the course; or just because they have some kind of disability that, as an handicap, may affect is normal frequency at the University). In this sense, technology clearly seems to promote inclusion.

As pointed out by Delpizzo, the inclusion of visual-impaired students in Higher Education (HE) faces several problems being the main issue the capacity to access pedagogical and scientific materials and books or papers accessible for instance through Braille, as to amplified or digital materials that can support the earning process offered by the academia (Delpizzo, 2005). Technology is then a crucial tool to overcome these problems.

Technology as a powerful support to teaching is very important for the inclusion of disabled students. However, instead of reducing the importance of the teacher, technology contributes to his increasing importance as a mediator in the learning process (Parra and Infante, 2009). But it is also very relevant the support of many of the other actors that intervene in the teaching-learning process, including the HE's staff and other classmates, or even families of the students. So, the biggest advantage of the use of technologies for inclusion still remains in the higher autonomy it grants to the disabled students (Carvalho, 2001). Go back to index

3. Recommendations (Tech)

These recommendations about technologies have not the ambition to cover all accessibility aspects related to technologies and University enrolment, physical access, logistics, or even services, as used by visually impaired or deaf people. Architectural design of buildings, for instance, and usability of buildings functionalities (such as doors width, elevator control panels buttons, audio-advices, etc.) are usually regulated by laws at national level, and will not be covered by these recommendations. This section will focus on aspects regarding the specific context of didactic provision by HEIs, in terms of course and program information, course contents, and course delivery.

3.1 Course conception

3.1.1 Accessibility policy

HEIs should provide institutional-level accessibility policies in order to define standards, aims and services provided in order to grant access to students with different learning needs.

From the technological point of view, several Universities around the world already defined accessibility policies, with different level of specifications.

University of Washington provides a list of example policies in Higher Education[1] that could work as a base for HEIs starting developing their own policies.

Policies should start with a general statement declaring the will of providing accessible information and services to all students, faculties, staff and general public regardless of disability[2].

Then they should address at least three components of accessibility services provision:

1. Information provision (Web accessibility);

[1] http://www.washington.edu/accessibility/requirements/example-policies/
[2] http://www.calstate.edu/accessibility/documents/Campus_Accessibility_Strategy_for_Online_Education_2013.pdf

2. Courses design and delivery;
3. Support and training to teaching and technical staff.

3.1.2 Information accessibility

Within its accessibility policy statements, a HEI have to state fundamentally two things: the standard it aims to comply to, and the level of compliance it aims to meet.

World Wide Web Consortium (W3C), the international NGO based in Cambridge that defines technical standards and communication protocols for the Web with the aim of continuous improvements, firstly defined the initial set of standards for Web contents accessibility in 1998; it was called WCAG (Web Content Accessibility Guidelines) 1.0. The updated version, WCAG 2.0, was published in 2008. WCAG 2.0 are structured in 62 success criteria, organized under four main pillars; Web contents, in order to be accessible, have to be:

1. Perceivable;
2. Operable;
3. Understandable;
4. Robust.

More details about WCAG 2.0 are provided in following recommendations. Each of the 62 success criteria is marked with A, AA or AAA representing the level of conformity to the whole WCAG 2.0 standards; meeting all the A-level priorities means providing a baseline accessibility offer; meeting AAA-level means complying with all the 62 success criteria, and being full-accessible.

HEIs should comply also specific, national level accessibility recommendations, provided in form of laws, regulations, government-related standards or guidelines. Beyond European Union countries, one of the most relevant is definitely the so-called Section 508 standards, issued by USA Department of Justice, Access Board and General Services Administration within the 1998 Rehabilitation Act Amendments. Section 508 Standards is often used as a benchmark in accessibility evaluation. They apply to electronic and information technology

procured by USA federal government, including computer hardware and software, websites, phone systems, and copiers[3].

The W3C's WAI – Web Accessibility Initiative – provides a list of national-level policies relating with Web accessibility. The commented list is available at https://www.w3.org/WAI/Policy/. Page is not regularly updated.

At EU level, in February 2014 a draft law was endorsed by the European Parliament, stating the need to provide access for all citizens to website managed by public administrations. In the draft, no specific reference standards were mentioned.

Once defined the reference standard to be used in the HEI's Web accessibility policy should address:

1. Reference Standards;
2. Conformance level;
3. Scope of the policy;
4. Conformance milestones;
5. Monitoring and review process.

[3] https://www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-section-508-standards

In the following box, Web Accessibility Policy statements from Cambridge University Accessibility Policy[4] refer to WCAG 2.0 standard:

> All web pages should be assessed by the guidelines published by the Web Accessibility Initiative (WAI) from the World Wide Web Consortium, known as Web Content Accessibility Guidelines (WCAG) 2.0, available at http://www.w3.org/TR/WCAG20/. The University requires that:
>
> - All **new** web pages should be written to at least conformance level 2 standard (AA), but to conformance level 3 standard (AAA) if possible.
> - All existing pages should meet at least conformance level 1 standard (A) of Web Content Accessibility Guidelines (WCAG) 1.0 (http://www.w3.org/TR/WCAG10/).
> - **Most pages** should meet conformance level 1 standard (A) of the newer guidelines by 1 September 2011. A development plan should be in hand to make all pages conformant to at least A level within as short a time as possible.
>
> Departments, faculties and research groups and other groups that publish information on the web are responsible for being conversant with accessibility issues, auditing their web material and taking reasonable steps to ensure their websites comply with these requirements. Any **third-party** who is engaged to design web pages for the University, whether hosted within or without cam.ac.uk, will be required to comply with these guidelines. Sites will be checked periodically.

[4] https://www.cam.ac.uk/about-this-site/accessibility/university-of-cambridge-web-accessibility-policy

WAI – Web Accessibility Initiative – provides a simple Policy Template; hints in brackets are the section to be completed by the specific HEI[5]:

> [Organization name] is committed to ensuring accessibility of its website for people with disabilities. New and updated web content produced by our organization will meet [link to standard], Version[version number], [level of conformance], by [compliance date].
>
> Existing web content produced by our organization will meet our standard by [existing content compliance date].
>
> Content provided for our site by third-party developers will meet [third-party content standard], Version [version number] by [third-party content compliance date]. This [does/does not] include user generated content.
>
> We aim to ensure that our authoring tools and processes meet [authoring tools standard], Version[version number] by [authoring tools compliance date]. By [preferential purchasing date] we will preferentially purchase authoring tools that meet or exceed our web accessibility policy.
>
> This policy will be reviewed [review period] on or before the [policy review date]. This policy was last reviewed on [last review date], by [reviewer].

[5] https://www.w3.org/WAI/impl/pol.htmlN

The same Web page from WAI website provides useful information for developing the different sections of a Web accessibility policy in any organization.

3.1.3 Courses accessibility

Courses accessibility must comply with Web accessibility standards defined in the previous paragraph as well; furthermore, accessibility in teaching and learning processes addresses also other pedagogical and technological aspects.

At organizational level, from the pedagogical point of view, HEI should provide guidelines and a reference framework to be the base of Curricula, course and didactic material design and provision. A complete framework for accessibility in Higher Education, providing theoretical foundation and practical guidelines and examples, is the UDL – Universal Design for Learning – framework[6], defined in the USA Higher Education Opportunity Act of 2008 (HEOA)[7]. UDL has been elaborated by CAST in Teaching Every Student in the Digital Age by Rose & Meyer (ASCD, 2002), The Universally Designed Classroom (Rose, Meyer, & Hitchcock, Eds.; Harvard Education Press, 2005), and A Practical Reader in Universal Design for Learning (Rose & Meyer, Harvard Education Press, 2006). Further details about UDL are provided in the following sections of this document.

The Quality Matters Higher Education Rubric (5th Edition, 2014) is a set of 8 General Standards and 43 Specific Review Standards used to evaluate the design of online and blended courses. Rubric is based on the concept of "alignment", a situation verified when critical course components (Learning Objectives, Assessment and Measurement, Instruction Materials, Course activities and Learner Interaction, and Course Technology) work together to ensure students achieve desired learning outcomes[8]. Standard 8 is specifically about Accessibility and Usability. The Standards from the QM Higher Education Rubric are available for free download after user registration on the QM website[9].

[6] http://www.udlcenter.org/aboutudl/whatisudl
[7] http://www.udlcenter.org/glossaries/glossary_eng#higher_education_opportunity_act_2008
[8] https://www.qualitymatters.org/rubric
[9] https://www.qualitymatters.org/user?destination=%2Fnode%2F2305%2Fdownload%2FQM%2520Standards%2520with%2520Point%2520Values%2520Fifth%2520Edition.pdf

A good practice comes from Stanford University's Office of Accessible Education. Beyond specific services designed for different kinds of disabilities (see services provided by Vista Center for Blind and Visually Impaired), OAE provides:

1. **Guidelines for determining essential requirements for Courses/Programs**[10], as an essential elements for instructors to treat all students fairly and determine reasonable accommodations for students with disabilities;

2. **Exam Accommodations for students**[11], allowing students with disabilities to represent fairly their knowledge and skills while mitigating the impact of disability-related impairments.

From the technological point of view, procurement of accessible IT that will affect course content production and learners' usage of course contents should be regulated at organizational level. University of Washington defines a three-step process in IT procurement:

1. Vendors must be asked to provide information about the accessibility of their products.

2. The information provided by vendors must be valid, measured using a method that is reliable and objective.

3. Those making procurement decision must be able to objectively evaluate the accessibility of products, and to scrutinize the information provided by vendors.[12]

University of California publishes its Procurement and Product accessibility policy, mainly based on the Voluntary Product Accessibility Template (VPAT), a Word-format template, freely downloadable at http://www.itic.org/policy/accessibility/, developed by USA IT Industry Council, to help buyers in assessing a product's compliance with accessibility standards. Please note that VPAT is mainly based on abovementioned US Section 508 accessibility standards.

[10] https://oae.stanford.edu/faculty-teaching-staff/determining-essential-requirements-coursesprograms
[11] https://oae.stanford.edu/accommodations/academic-accommodations/exam-accommodations-students
[12] http://www.washington.edu/accessibility/procurement/

Good practice is MIT Accessibility and Usability group, providing design, code, instructional design reviews and consultancy and advising services to MIT[13]. Furthermore, MIT Assistive technology consultants provide guidance and services to facilitate the use of assistive technologies and access for persons with disabilities at MIT[14].

3.1.4 Support and training to faculty and teaching staff

Continuous support to faculty and teaching staff is fundamental in order to comply with accessibility standards in day to day didactic activities.

Good practices are both creating a specific accessibility office and developing and providing training programs for HEI staff. Accessibility consultants will provide reviews and assessments of technologies, documents, courses and instructional design. Training programs should cover both Course design, Content production and Assessment accommodations, following policies and guidelines defined at organizational level. Go back to index

3.2 Pedagogical Approach to Curriculum and Course Design

The abovementioned UDL – Universal Design for Learning - framework is a set of principles for curriculum development, addressing four interrelated components:

- **Goals:** focus is not on specific sets of skills or competences, but on developing "expert learners";
- **Methods:** instructional approaches, techniques, decisions that teachers us to foster learning in students; in UDL framework, focus is on facilitating differentiations of method based on learner variability;
- **Materials:** media used to present learning contents and used by learners to demonstrate their knowledge. Focus is on differentiation and variability of materials

[13] http://ux.mit.edu/accessibility/
[14] http://ux.mit.edu/atic

both for conveying theoretical contents and for strategic learning and for learning engagement.

- **Assessment:** UDL assessments reduce or remove barriers to accurate measurements of learner knowledge, skills and engagement, improving accuracy and timeliness of assessments.

Three primary principles, which are based on neuroscience research, guide UDL and provide the underlying framework for the Guidelines[15]:

1. Provide multiple means of representation;
2. Provide multiple means of action and expression;
3. Provide multiple means of engagement.

The three principles address the "what", the "how" and the "why" of learning, affecting three different brain networks: The Engagement; the Representation; the Action and Expression.

Source: http://www.cast.org/our-work/about-udl.html#.VqQqufnhCM8

UDL Guidelines – version 2.0 – are available for download in English and several other languages (Arabic, Catalan, Chinese, French, Greek, Italian, Japanese, Korean, Portuguese, Spanish) at http://www.udlcenter.org/aboutudl/udlguidelines/downloads.

University of Tennessee developed a **Syllabus Template** aligned with UDL Guidelines. They provide also additional information about:

- Developing Learning Outcomes[16];
- How-to write Learning Outcomes[17];
- How-to about Rubrics[18];
- A guide for Creating a Syllabus[19].

[15] http://www.udlcenter.org/aboutudl/whatisudl/3principles
[16] http://tenntlc.utk.edu/learning-outcomes/
[17] http://tenntlc-utk-edu.wpengine.netdna-cdn.com/files/2013/11/learning-outcomes.pdf
[18] http://tenntlc-utk-edu.wpengine.netdna-cdn.com/files/2013/05/How-To-Rubric_TennTLC-ReviewReduc.pdf
[19] http://tenntlc.utk.edu/creating-a-syllabus/

Last updated version of University of Tennessee Syllabus Template is available in Word format at http://tenntlc-utk-edu.wpengine.netdna-cdn.com/files/2011/08/COURSE-SYLLABUS-2015final.docx. Go back to index

3.3 Course content production

Course contents design and production are covered both by the abovementioned Principle I from UDL Guidelines[20] and by WCAG standards[21].

The first, and probably most important, principle stated by both UDL and WCAG regards providing multiple options for perception: specifically, non-textual contents must be provided with a text-equivalent alternative. Guideline 1.1 from WCAG 2.0 states "Provide text alternatives for any non-text content so that it can be changed into other forms people need, such as large print, braille, speech, symbols or simpler language". Audio and video contents are useful and effective in learning, but not usable by all learners. Guideline 1 of UDL states: "To reduce barriers to learning, it is important to ensure that key information is equally perceptible to all learners by: 1) providing the same information through different modalities (e.g., through vision, hearing, or touch); 2) providing information in a format that will allow for adjustability by the user (e.g., text that can be enlarged, sounds that can be amplified)".

Both UDL and WCAG 2.0 provide examples and techniques to implement this (and all the others) guideline.

All the WCAG 2.0 guidelines relate with contents and should be applied to course contents design; the following is the list of all the WCAG 2.0 principles and guidelines[22]:

1. Perceivable
    - 1.1 Provide text alternatives for any non-text content so that it can be changed into other forms people need, such as large print, braille, speech, symbols or simpler language.
    - 1.2 Provide alternatives for time-based media.

[20] http://www.udlcenter.org/aboutudl/udlguidelines/downloads
[21] https://www.w3.org/TR/WCAG20/
[22] https://www.w3.org/TR/WCAG20/#guidelines

1.3 Create content that can be presented in different ways (for example simpler layout) without losing information or structure.

1.4 Make it easier for users to see and hear content including separating foreground from background.

2. Operable

2.1 Make all functionality available from a keyboard.

2.2 Provide users enough time to read and use content.

2.3 Do not design content in a way that is known to cause seizures.

2.4 Provide ways to help users navigate, find content, and determine where they are.

3. Understandable

3.1 Make text content readable and understandable.

3.2 Make Web pages appear and operate in predictable ways.

3.3 Help users avoid and correct mistakes.

4. Robust

4.1 Maximize compatibility with current and future user agents, including assistive technologies.

As already said, WCAG 2.0 Guidelines are structured in success criteria with different level of compliance (A, AA, AAA). Moreover, WCAG 2.0 provides also a "Techniques" page in which are listed a series of tips and implementation examples for providing specific file-type in an accessible way. Current techniques provided cover:

A. General Techniques;
B. HTML and XHTML Techniques;
C. CSS Techniques;
D. Client-side Scripting Techniques;
E. Server-side Scripting Techniques;
F. SMIL Techniques;
G. Plain Text Techniques;
H. ARIA Techniques;

I. Flash Techniques;
J. Silverlight Techniques;
K. PDF Techniques;
L. Common Failures. Go back to index

3.4 Course delivery

While WCAG is strictly focused on Web content technology, UDL Guidelines covers both the technological and the pedagogical aspects. Each Guideline is structured in Checkpoints, providing further specifications and Implementation Examples for each of the Checkpoints. The following is the list of Principles, Guidelines and Checkpoints of UDL Guidelines[23]:

Principle I. Provide Multiple Means of Representation

Guideline 1: Provide Options for Perception

Offer ways of customizing the display of information
Offer alternatives for auditory information
Offer alternatives for visual information

Guideline 2: Provide Options for Language, Mathematical Expressions, and Symbols

Clarify vocabulary and symbols
Clarify syntax and structure
Support decoding of text, mathematical notation, and symbols
Promote understanding across languages
Illustrate through multiple media

Guideline 3: Provide Options for Comprehension

Activate or supply background knowledge
Highlight patterns, critical features, big ideas, and relationships

[23] http://www.udlcenter.org/aboutudl/udlguidelines/downloads

Guide information processing, visualization, and manipulation

Maximize transfer and generalization

Principle II. Provide Multiple Means of Action and Expression

Guideline 4: Provide Options for Physical Action

Vary the methods for response and navigation

Optimize access to tools and assistive technologies

Guideline 5: Provide Options for Expression and Communication

Use multiple media for communication

Use multiple tools for construction and composition

Build fluencies with graduated levels of support for practice and performance

Guideline 6: Provide Options for Executive Functions

Guide appropriate goal-setting

Support planning and strategy development

Facilitate managing information and resources

Enhance capacity for monitoring progress

Principle III. Provide Multiple Means of Engagement

Guideline 7: Provide Options for Recruiting Interest

Optimize individual choice and autonomy

Optimize relevance, value, and authenticity

Minimize threats and distractions

Guideline 8: Provide Options for Sustaining Effort and Persistence

Heighten salience of goals and objectives

Vary demands and resources to optimize challenge

Foster collaboration and community

Increase mastery-oriented feedback

Guideline 9: Provide Options for Self-Regulation

Promote expectations and beliefs that optimize motivation

Facilitate personal coping skills and strategies

Develop self-assessment and reflection

In face-to-face classes specific technologies can be used in order to enhance learners opportunities; specifically regarding visually impaired, deaf and hard to hearing learners, a set of assistive technologies can be provided directly in classroom: speech-to-text and text-to-speech software, screen magnifier, braille printers, etc. Assistive technology cannot work "alone", and accessible course design and delivery guidelines must be followed in order to guarantee to all students an effective learning experience. Go back to index

3.5 Learners' Evaluation/Assessment

Specific settings and technology provision can be envisaged for visually impaired and deaf learners. These accommodations should not impact on the fairness of the exam itself; courses should be designed taking into consideration the "essential requirements" principle, stated by Stanford University Office of Accessible Education[24]. Assessment should not be a final event, but should be a process taking place all over the course delivery phase. Final exam accommodations for visually impaired, deaf and hard to hearing learners can consist of:

a) Text recognition software;
b) Real-time captioning software
c) Text/Screen magnifier

Final exams can also be accommodate using non-technological aids, as Sign Language interpreters, scribes, readers. Go back to index

[24] https://oae.stanford.edu/faculty-teaching-staff/determining-essential-requirements-coursesprograms

PART III – RESULTS OF THE EMPIRICAL WORK

1. Methodology used

The empirical work in each country was based upon a desk research, a questionnaire focused on visually and hearing impaired students and semi-structured interviews directed to HEI representatives.

The primary aim of the desk research has been to identify the main needs and gaps in the field of education of visually and hearing impaired persons. The purpose of this task was to identify existing knowledge based upon accessibility strategies and existing questionnaires, with the purpose to develop a new questionnaire. The sources used were Internet, on-line databases, government statistics, national reports, research projects articles and books.

Survey data in the four countries was collected with on-line questionnaire in 1KA software. The questionnaire was developed in English and each of the participating countries then translated it into its national language. Each of the countries tried to reach the number set with the non-probability sampling method. The purposive sampling technique was used as the target population was very specific. To reach the target group HEI were contacted with the request to invite students to participate in the survey (due to personal data protection the students could not be contacted directly by the partners of the project, which was one of the obstacles and difficulties in reaching the target population). Also associations for hearing and visually impaired were contacted and asked for help to reach the target number of the respondents. In Portugal the project partners associations of visually and hearing impaired contacted the majority of Portuguese students inquired. Another method was snowball sampling – students who participated in the survey were asked to invite other students to participate in the survey. In total 98 respondents participated in the survey. Data collection took place between April and August 2015.

As results obtained by desk research and the survey needed some deeper insight, the third part of "Gaps and needs analyses" work package were semi-structured interviews

conducted in the four countries. The respondents were the representatives of the office for disabled students from HEI. Interviews were conducted using several methods: face-to-face, e-mail or via telephone/skype. The 43 interviews were conducted between April and September 2015. Each of the countries prepared a report based on the same template.

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2. Desk research for each country

2.1 Basic Legislation for the inclusion of visual and hearing-impairments in HE

2.1.1 Italy

For Basic Education addressed to Deaf/Blind students:

Law	**Description**
Law 104/92, Article 12, paragraphs 5, 6 and 8	Foresees the set of Individualized Education Plan (IEP) for pupils with disabilities. The Plan is defined by teachers, family and social/health operators according to a diagnosis.
Law 104/92, Article 13, paragraph 1, letter a	The Plan needs to include the summary of the project rehabilitation, to socialize and to teaching.
Law 104/92 art. 14	The right for disabled pupils to have human /technological support, e.g.: teacher expert in Braille Alphabet for blind pupils; interpreter of sign language or provision of a "magnetic field" in the classroom to reduce the noises effect on hearing aid of deaf pupils or computer programs of "simultaneous subtitling", that translates into a line of furniture words the words spoken by teachers.

For Higher Education addressed to Deaf/Blind students

Law	**Description**
Law 17/1999	Guarantees for disabled students enrolled at the university technical aids, specific teaching as and support of specialized tutoring. Establishes a professor for coordinating, monitoring and supporting of all the initiatives for inclusion of disabled people within the university.

2.1.2 Portugal

For Language course addressed to Deaf Students:

Law	**Description**
Law 1/1997, art. 74	States the protection and development of Portuguese sign language, as an expression of culture and an instrument for access to education and equal opportunities.

For Basic Education addressed to Blind / Deaf students:

Law	**Description**
Law 3/2008, art. 24	Creates Reference Schools for blind and partially sighted students, detailing how educational support for these students is to be organised.

For Higher Education addressed to Blind / Deaf students

Law	**Description**
Port. 743-A/2009	Defines special quotas for disabled candidates on the National Competition for Access and Entry into public higher education.

2.1.3 Slovenia

For Language addressed to Deaf Students

Law	**Description**
ZUSZJ/2002	Lays down the right of deaf persons to use Slovene sign language and to have access to information using techniques adapted to their needs and the scope and manner of exercising the right to a sign language interpreter in connection with their equal inclusion in the living and work environment and in all forms of social life, with the same rights, conditions and opportunities as persons with no hearing deficit.

For general Education addressed to Blind / Deaf students

Law	**Description**
ZUOPP-1/2011	Addresses children with special needs in all level of education – from pre-school to higher education, and determines the methods, forms and adaptations of education.

2.1.4 Sweden

For Language addressed to Blind / Deaf Students

Law	Description
Law on support and service to people with disabilities (SOU 2008: 77)	Children who due to physical, mental or other reasons need special support in their development shall be given the support that their special needs require. The preschool head should ensure that a child is given an assistance until as long as he or she needs it (based on the data from the pre-school staff, child or a child's guardian) The child's guardians shall be given the opportunity to participate in the formulation of the specific support measures.
Act on Support and Services to Disabled Persons	Children with severe disabilities are entitled to personal assistance and a number of other forms of support and service. (Lag om stöd och service till vissafunktionshindrade, LSS)

For Basic Education addressed to Blind / Deaf students

Law	**Description**
The Education Act (Skollagen SFS2010:800)	A natural or legal person conducting activities referred to in the Education Act (1985:1110) or other educational services (an educational provider) may not discriminate against any child, pupil or student participating in or applying for the activities.
Discrimination Act, 2008: 567SFS (2008: 567)	Aims to protect against discrimination based on gender, transgender identity or expression, ethnic origin, religion or other belief, disability, sexual orientation or age.
Specialskoleförordningen SFS 2011:185	Ordinance for schools for pupils with impaired hearing/vision and physical disabilities

For Higher Education addressed to Blind / Deaf students

Law	**Description**
Equal Treatment of Students at Universities Act (2001:1286)	No student at university or other institution of higher education in Sweden should be discriminated.

In the four countries there are difficulties in obtaining information on total enrolled hearing and visual impaired (HVI) in HEI.

In Italy there are two main reasons for statistical limitations: a) many of them – being disabled when adult - still have problem in declaring their physical deficit; b) the statistic department of the Italian Ministry of Education does not reveal data on disabled students.

In Portugal there are statistical difficulties for identifying visually and hearing impaired people due to the use of the International Classification of Functioning, Disabilities and Health which does not make a clear distinction between the essential types of impairments. In 2014 it was implemented a national inquiry on support granted to HEI students with special educational needs. In this inquiry the majority of HEI were not able to provide rigorous information on total enrolled HVI.

In Slovenia there are some formal obstacles due to no uniform terminology, which causes ambiguity in the area of defining of students with special needs. Besides, procedures for obtaining the status (of student with special needs) are not uniformly regulated.

In Sweden there is no aggregated data about how many HVI there are at universities and colleges. This is partly due to disability being not clearly defined, partly due to disabilities not being registered in Swedish society. However, there is data on how many students with disabilities during a calendar year has sought support measures at colleges and how many of those who have received such aid: 203 visually impaired, 203 hearing impaired and 153 received support in terms of sign language interpreting. This data was collected and compiled by Stockholm University in 2009.

In the four countries there is general legislation regarding the educational rights of disable people.

In Italy the right to education of disabled people is guaranteed by the Law n.104/1992 later integrated with law n.17/1999 - ensuring their social integration and highlighting their right to be informed and educated. The same law guarantees the provision of didactical and

technical material, adapted exams, information and support, programs and specialized languages of adequately qualified staff (teaching or not).

In Portugal, candidates with physical and sensorial impairments have an annual special quota to access higher education. The Constitution of the Portuguese Republic, has kept the article regarding Portuguese Sign Language. The Law regarding Students with Special Educational Needs created Reference Schools for Bilingual Education of Deaf Students and recognises the deaf linguistic community and its institutions as the authorities for the evaluation and certification of sign language competency, namely of teachers working within bilingual education. The same law also set up Reference Schools for Blind and Partially Sighted Students.

In Slovenia the Law on the Placement of Children with Special Needs addresses children with special needs in all level of education – from pre-school to higher education. The law determines the methods, forms and adaptations of education.

In Sweden the non-discrimination laws regulate prohibition against discrimination at institutions of higher education, including an obligation to take reasonable measures of accommodation. The principle guideline of the Education Act is that the State provides education for all young people at all levels (see below).

While in Italy, Portugal and Slovenia not all of the HEI have specific regulations for the integration of HVI students, in Sweden the Equal Treatment of Students at Universities Act centralize the regulations for disabled people.

In Italy the Decree of the President of the Council of Ministers 30 April 1997 - Uniform treatment regarding the right to higher education according to the art. 4 of Law December 2nd, 1991, n. 390 - sets the minimum useful standards to access to services addressed to university students. It requires each university must to create a special department - Servizi Disabilità Di Ateneo, SDDA - charge of all services for disabled students. Among these, a specialized tutor, assistance for mobility, teaching material and technological support that the SDDA must make available for the student or special tools and procedures for taking exams.

In Portugal in 2014, according to the national inquiry referred above, 50% of 171 public and private HEI responded 'yes' to the existence of a specific regulation for impaired students

(28% of the HEI inquired did not respond to this question). Generally specific regulations include articles regarding class attendance (priority to attend practical classes, permission for recording, rights are the same as working-student), individual support by teachers, tutors or students, and assessment.

In Slovenia we can refer examples of regulations in two institutions. For example the Regulation of the learning process for students with disabilities at the University of Maribor governs the adaptation of the study process of students with disabilities. Adjusting refers to the communication accessibility adaptations of lectures and exercises, and other forms of the study process, adjustments to academic requirements and the availability of and adaptation to study literature.

In Sweden, according to the Equal Treatment of Students at Universities Act, no student at university or other institution of higher education in Sweden should be discriminated. This covers all levels of the studies: admission, study environment, teaching, and examination. The above-mentioned act enjoins all universities annually to draw up plans of action regarding inclusion measures. The Agency introduced a special provision that clarifies universities' responsibility for students with disabilities.

The services and initiatives adopted, developed and adapted by HEI in the four countries relate mainly to curricula, assessment, specific support services/products, individual support and special funding.

The services/initiatives offered by Italian HEI are very similar, but there are differences related to the territorial situation and the economic possibility of each institute. For example the University Roma Tre offers a "listening psychological" service for support on issues related to the educational path; in University of Milano, since 1993 a voluntary service offers accompaniment / assistance in educational activities and carrying out bureaucratic task; in University of Padova for deaf students it is possible to attend lessons simultaneously transcribed by an operator and displayed on a monitor.

In Portugal, according to the same inquiry, 55% of 238 public and private HEI responded 'yes' to the existence of a contact service or person to welcome and support the students. Compared with 'curricula and assessment adaptations', 'specific support products' and 'individual support' show more limitations especially on the public and private institutions located in the less developed regions of Portugal.

Swedish National Agency for Higher Education made possible that even private educational institutions, who are authorized to issue the qualifications the Agency announced in regulations, can receive funds from Stockholm University disposal as special funds for disabled students. This of course assumes that the private higher education institutions, like universities of the public domain, must set aside 0.15 per cent of their funds from the state to provide assistance where needed for students with disabilities. The Stockholm University must also report the total number of students with disabilities at universities with breakdown by college and disability. At all universities and institutions of higher education there is a contact person/coordinator, working with issues relating to educational support for students with disabilities.

The four countries show various needs and gaps in terms of accessibility, adaptations and social inclusion of HVI students in HEI.

In Italy N. 30 (39,3% male; 60,7% female) hearing and visually impaired students took part in the analysis.

Participants classified by impairment: Partially deaf, 14.3%; Deaf, 28.6%; Partially sighted, 25% and Blind, 32,1%.

The majority of the respondents affirmed they required adaptations to learning materials. In particular they are in favour of the following options:

a) Dividing exams into several parts (both deaf and blind students).
b) Reducing the quantitative (not qualitative) demands of written tests or extending the time available for completing tests.
c) Giving greater weight to contents rather than to form and spelling when marking tests.
d) Greater job inclusion support after university.

In Portugal both visually and hearing impaired HE students refer the positive aspects of physical accessibility but, on the other hand, they emphasise the negative elements of 'soft accessibility' namely regarding individual support and 'mind openness' of Universities Top Boards, teachers and administrative staff toward their specific needs. Visually impaired HE students report difficulties regarding teachers' authorization to class recording and the complete or almost absence of audio classes.

As we saw above, candidates with physical and sensorial impairments have an annual special quota to access higher education. At present it is 2% or 2 places, whichever is higher, for all impairments. When HEI require exams in addition to the nationally required ones, no provision is generally in place for deaf or blind prospective students. There does not seem to be an expectation that these students may indeed desire to further their education and acquire qualifications in HE. Considering them 'impaired' and 'special needs' has led to lowered expectations regarding these students.

Since Deaf Bilingual education means having Portuguese as a second language, the Portuguese Language exam required to be able to apply to Higher Education is adapted accordingly. No other exams take into consideration the language needs of this population. The greatest difficulties for the deaf begin after entering the desired course. Although bilingual education implies that for these students classes are to be taught using Portuguese Sign Language, namely with deaf teachers, subject teachers who are fluent in sign language and interpreters as a resource, this is not continued in higher education. Thus, the deaf themselves take on the payment of interpreters, as well as having to raise awareness about their needs to professors. In this context, the importance of mutual support among HEI impaired students is also reinforced, influencing the choice of HE degree based on whether other deaf students are also applying to it, the degree of support available in that specific university, namely the existence of interpreters, and the apparent suitability of the course. Other deaf students do however follow their own path, choosing their undergraduate studies based on their interests. These students generally have little to no institutional support during the course of their studies, relying on external resources and their own sheer effort to carry on their studies to full term.

For a deaf student without an interpreter, professors' lectures are virtually inaccessible, so the examples and personal touch of the lecturer is lost. Class debates, which are a rich source of shared information and the development of ideas are beyond the deaf student's access. The student relies on the bibliography and on notes taken by fellow hearing students, which is a poor substitute as notes tend to be very personal, including only what is new or interesting for the student, not what s/he has prior knowledge of.

Visually impaired people have been pursuing higher education for many years and both the barriers and good practice have been identified. In general terms VI students who have experienced higher education and teachers who have successfully taught those students

know what has to be done to make knowledge accessible. Unfortunately good practice has not been applied universally across the sector, and even within individual universities access may vary across departments and courses because the role played by a university's staff is critical. Regular comments about how difficult it must be to succeed on a course or to pursue a particular profession without vision are not conducive to learning.

When people with little or no experience of visual impairment turn their attention to the subject they tend to think that braille will solve all of a VI student's problems. For some students documents in braille are a valid option but the braille code can only reproduce the written portion of a book or article. Any images or illustrations will have to be analysed to decide if they need to be described and/or converted into a tactile image. But even an avid braille reader will prefer to receive certain documents in a digital format that allows them to make searches, introduce changes and add notes. And then there are the many VI students who do not read braille, often because they have enough vision to read ordinary text, provided they can adjust the size of the letters and possibly change the font and/or colour. So good practice says the HEI will be able to supply study and evaluation materials in diverse formats, free of charge and at an appropriate time, while individual students may request documents in a number of formats.

The fact that VI students can scan documents to produce their own digital formats does not mean that the problem of accessing working materials has been overcome. Scanner software is not infallible – numbers can easily be misread and tables omitted - so the digital file needs to be proof read to ensure it matches the original. This service should be provided by the HEI. Once again the question of how to represent images arises.

Likewise granting VI students the right to record lessons is a good practice which does not overcome all barriers, since a teacher will often be pointing to an image while explaining a process or object which, naturally, will not appear in the recording unless the teacher describes the image. For this reason a personal assistant who can take notes for the student will be a better option in some cases.

Well organised and flexible teachers are an essential ingredient. A teacher who can provide a VI student, beforehand, with a copy of the presentation to be used in the lesson in the font, font size and colours the student prefers will be making a major contribution to that

student's success. As will a teacher who can get into the habit of using more precise and descriptive language than "like this" "here" and "that one". Teachers also need to respect the deadlines the Support Service sets for submitting materials that need to be converted into alternative formats.

Many VI graduates talk about the support they received from their fellow students and how that contributed to their success. While there is much to be said in favour of cooperation between students it is also true that it is hard to be treated as an equal if one is always asking for a favour. Furthermore this approach suggests that the HEI's inability to create an inclusive learning environment is acceptable: people with special needs should rely on solidarity. That is the wrong message. Whereas in an HEI where such support is generally unnecessary because the barriers have been eliminated and suitable adjustments have been made by the teaching and other staff in cooperation with the Support Service, VI students are more likely to be seen as people who are furthering their education in order to play a full role in society.

In Slovenia there are 'system' obstacles: inadequate architectural adjustments, inadequate adaptation of the organization of study and evaluation, inadequate qualifications of trainers, ignoring the needs of students with special needs when preparing study programs, and inadequate funding. It is very often, that a HEI with a high number of students with disabilities, provide good support for the disabled, while other faculties have fewer experiences with the disabled and consequently there is no one who would deal with the issue. Deaf students have difficulties following the lecture. The system of financing sign language interpreters is not yet fully established. HEI are legally required to provide an interpreter, but in practice this often does not happen.

In Sweden many students do not consider information about the support to be easily accessible. They indicate that HEI should do more in this respect. Additional measures desired by students are improved forms of support, more information about the support and better awareness level of the teaching staff regarding disabilities. It is to mention, that there is a number of psychological issues, such as:

a) Many students say that their study choices are affected by the disability.

b) Many disabled students feel that the disability affects adversely the studies. The most common description of this is that disability means that the studies will be much more time consuming and effort demanding.

c) There seems to be a widespread dissatisfaction with their own learning outcomes among students with disabilities.

A lot of work remains to get the universities premises physically accessible. Universities are currently working on this and progress. HEI information on opportunities for students with disabilities to study at the university exists, but must be reaching the target audience better than it does today. Another issue is that HEI sometimes have trouble deciding which department of the college shall be responsible for working with disabled, and what exactly falls under the other organizer's responsibility. The staff dealing with disability issues at universities often work in a special counsellor department. There is work to be developed in order to raise teachers' awareness and understanding of issues of disabilities, and to actively promote cooperation with international partners in this area.

To sum up, while the university, its courses, and ICT based or other materials should be designed having the needs of deaf and visually impaired people in mind, providing the lecturers with information regarding the needs of such students, as well as other personnel, each student should be regarded as an individual and resources should be matched to the student's needs and/or preferences.

Desk research in each country provided an essential knowledge basis to concept survey questionnaire on HEI hearing and visually impaired students and to define the guidelines for the semi-structured interviews directed to HEI representatives.

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3. Survey conducted in the four countries

3.1 Population considered and sample obtained

For the survey we considered the overall population of visual and hearing impaired students in HEI, as well as the universe of HIE in each country involved. The statistical data available refers to disabled HEI students but there are no rigorous data on HVI students.

In terms of the students that participated in our survey, the results per country are the following[25]:

- For Italy we had: 30 respondents for the on-line questionnaire (11 male; 17 female). With the following type of impairment: 4 Hard of hearing; 8 deaf; 7 partially sighted and 9 blind.
- For Portugal we had: 49 respondents for the on-line questionnaire (15 male; 20 female). With the following type of impairment: 5 Hard of hearing; 22 deaf; 6 partially sighted and 9 blind.
- For Slovenia we had: 6 respondents for the on-line questionnaire (4 male; 4 female). With the following type of impairment: 1 Hard of hearing; 2 deaf; 1 partially sighted and 2 blind.
- For Sweden we had: 13 respondents for the on-line questionnaire (6 male; 7 female). With the following type of impairment: 7 Hard of hearing; 2 deaf; 1 partially sighted and 1 blind.

Our study also comprised interviews to a total of 43 HEI in the four countries involved.

The table below shows how many HEIs were interviewed in each Country.

Italy	5
Portugal	23
Slovenia	6
Sweden	9

[25] In several cases, the sum of the data is not coincident with the total observations, giving the fact that some of the surveyed persons didn't answer to some type of questions (e.g. genre, type of impairment, etc…)

3.2 Main results

The main results of the on-line survey are the following:

- The majority of respondents (76,8%) are studying in the field of social sciences.
- Among hearing impaired there are more students studying natural science compared to visually impaired students, where the majority is enrolled into social science programs.
- It is very positive that students mostly selected their study according to their interest (82,9%), 41,4% selected the study because they are good at it and 24,3% because it enables employability. However, 10% of respondents selected the study because they couldn't select anything else because of the impairment and 13% feel it is the only one they feel capable to do.
- 85,1% of respondents say they need total or partial adaptations of the learning materials. In case of blind students the percentage is even higher (100%).
- According to the impairment there are differences between the two groups of students. 82,1% of visually impaired students need ICT based didactic content, while among hearing impaired 40,6% respondents selected that answer. In both groups the majority of students said they need previous handling of study material (75% among visually impaired and 68,8% among hearing impaired). Also 62,5% of hearing impaired need support and orientation materials.
- 76,1% of respondents need total or partial adaptations of the lectures.
- The adaptations of the lectures vary according the two groups: 78% of visually impaired need previous handling of study material, 72% need more ICT based learning material and 39% need note taking by another student. For hearing impaired the most important adaptation is sign language interpretation (63%), followed by previous handling of study material (57%) and note taking by

professional (51%). Among this group more ICT based learning material is relevant to 43% of respondents.

- On average the students do not consider the actions of HEI services to be satisfying in terms of elimination of barriers, communication and information about the rights of disabled students and providing services to ensure equal opportunities.
- Students in general are quite critical with study adaptations received, especially with adjustment of exams, inclusion in the study process, adjustment of study materials, help of counsellor/disabled student services, special resources, help form student association, teaching materials/tools, programmes and exams. This is worrying since 7 out of 11 factors relating to study are below the average scale.
- Both groups of students with hearing disabilities are not satisfied with adaptations regarding availability of sign language interpreter, classroom note taking and permission to use speech to text devices. Both groups of students with visual disabilities are not satisfied with adaptations especially in terms of availability of large print materials and classroom note taking.
- Depending on the group considered, students are not satisfied with the impact of some barriers related to their impairment: support and orientation (deaf students are not satisfied with the impact of this barrier), learning experience in other on-campus classes (hearing impaired), use of university library (deaf), use of technical facilities (deaf and partially sighted), use of learning resources (hearing impaired), use of exercises, laboratories, tools and activities (deaf and visually impaired) and use of interactive tools/experiences (hard of hearing).
- The overall satisfaction with assessment adaptations is less worrying than with study adaptations. However, deaf students are not satisfied with oral presentations adaptations.
- The overall satisfaction with support/help of university staff (classmates, administrative staff and academic staff) is also less worrying than study adaptations. However, deaf students are not satisfied with support staff.

- In terms of perception of success by impairment, 50% of hearing impaired consider that they are less successful due to their specific impairment. The same indicators score 46,2% for partially sighted and 38,5% for blind.
- Students suggest different recommendations about improvement of learning experience. One of the most mentioned is the need for qualified experts' help (interpreters, tutors, and University staff) to support students and teachers.

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4. Interviews with HEI in the four countries

Based upon in-depth interviews directed to HEI representatives in the four countries, we can conclude that the services and adaptations for visual and hearing impaired students are quite similar. Nevertheless, we can see that in Portugal, Italy and Slovenia there is no centralized system or action, and each faculty functions a little bit different while in Sweden every institution questioned listed exact the same measures and adaptations they use in work with people with special needs.

The major obstacles on the institutional level are the following:

- Italy: the challenge of employment after the studies; if the number of disabled student increases additional financial resources will be needed.
- Portugal: financing the operationalization of the specialised offices to deal with disabled students, and the lack of exchange of good practices among HEI.
- Slovenia: there is no systemic financing for students with special needs.
- Sweden: there are no major obstacles, the institutions feel they have a reasonable knowledge and they are constantly in contact with the coordinator in Stockholm.

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1. Lessons learned from the survey and interviews

Needs assessment analysis within the ISOLEARN project focused on under-researched topic of needs in education process of visually and hearing impaired students in HE. Applying a mixed-method design with desk research, a web survey with students and in-depth interviews with representatives of higher education institutions revealed valuable feedback for increasing the understanding on needs of this vulnerable group.

The major conclusion is that these two groups need different adaptations as they have different needs. Also we can say they are not satisfied with current adaptations and there is a lot of room for improvement. From the interviews and also desk research we can conclude, that the institutions are trying to help students on their way to academic success, but results of the survey show, that they (institutions) are successful only to a certain extent.

Both groups of students are facing barriers related to lectures and assessments/examinations. Despite the adaptations provided, they are facing difficulties with:

a) Written examinations,
b) Multiple choice / other examinations,
c) Written course work (e.g. essays, reports etc.),
d) Oral presentations.

It is not enough they have longer time for writing, also the form of the exam should be better adapted, especially written and multiple choice examinations for visually impaired.

The improvement is especially needed in the following areas:

a) Adjustments of exams,
b) Inclusion of students with impairment into the study process,
c) Adjustment/adaptation of study materials,
d) Help of counsellor/disabled student services,
e) Special resources for deaf/blind students.

f) Teaching methods/tools, programmes and exams appropriate to the needs.
g) Help from student association.

In order to achieve the improvement, there is a need for an increase in competent dedicated staff, including teachers and support staff, who would have deeper knowledge about the needs of these groups of students. This is also the most often recommendation from the students: qualified personnel and services run by competent person or as one of the students pointed: "*… train the academic and administrative staff about disability, in particular in visual and hearing impairment…*" Go back to index

2. General Recommendations

General Recommendations (inspired on proper suggestions of the Parallel Report on the Monitoring of the Rights of Persons with Disabilities) - Portugal

- **To change the Portuguese legal framework** in order to enable the equal recognition before the law of all persons with disabilities, as stipulated on article 12 of the Committee of the Rights of Persons with Disabilities (CRPD)
- **To raise awareness in families** and throughout society about this issue
- **Proposed actions for awareness-raising on accessibility and social participation**:
  - To disseminate information on the rights of persons with disabilities and raise awareness throughout the Portuguese society on disability in order to demystify prejudices and stereotypes, and present persons with disabilities as human beings with equal rights;
  - To enforce the implementation of the existing Accessibility Law (Decree-law 163/2006);
  - To review the Accessibility Law (Decree-law 163/2006) in order to include norms about access to information and communication systems;
  - To adopt new editions of the National Plan to Promote Accessibility II (PNPA II) and the National Strategy for Disability II (ENDEF II);
  - To pass legislation concerning accessibility in all transportation systems (including public and private, urban and rural, metropolitan, regional and interregional) and to enforce existing accessibility norms applicable to transportation infrastructure (railway stations, stations and bus stops, etc.);
  - To increase the requirements set on private television operators regarding the number of hours broadcasted in an accessible format and increase the number of hours of informative programmes broadcast in accessible format in the public channels;

- To include the topic of accessibility and universal design on the initial training programmes of HE and specifically of engineers, architects and urban planners;

- **To promote independent living and inclusion in the community by:**

  - Creating a new legal framework to support independent living, to establish the professional role of Personal Assistant and implement a pilot-project of Personal Assistance, as it was already foreseen in ENDEF I (the National Strategy for Disability I), while providing for its progressive enlargement and including in this service the provision of Sign Language interpretation services; Economic Security and Support Services

  - Raising awareness and train civil servants (particularly those on front office tasks) to address disability issues and persons with disabilities from a human rights perspective;

  - Providing training to and support informal caregivers, so that they can play their role safely and respecting the human rights of the persons with disabilities being cared for;

  - Expediting and simplifying the procedures for the allocation of assistive devices and support products, in order to ensure an effective and cost-free universal system, taking into account the person in its context;

- **To create conditions for a truly inclusive education by:**

  - Increasing the number of mainstreamed reference schools for the education of blind and partially sighted children, bilingual education schools for deaf students, mainstreamed reference schools for early intervention and for children with multiple disabilities and the number of structured learning units for the education of students with autistic spectrum disorders;

  - Reinforcing the human and material supports for Inclusive Education;

- In the continuous training of teachers and non-teaching staff, tincreasing the provision of training on disability and inclusive education, namely on its principles as well as on intervention and evaluation strategies; In order to create inclusive schools these topics should receive high priority;
- Including disability issues as mandatory topic in the initial training of all teachers;
- Increasing the budget allocated to support education and early intervention with children with disabilities;
- Creating a legal framework for the provision of supports to students with disabilities in higher education and remove physical, information and communication barriers in universities, in accordance with existing legislation (Accessibility Law - decree-law 163/2006);
- Raising awareness and educate parents and school communities about disability issues;
- Introducing human rights and disability contents in the curricula of students in early school, and in primary and secondary education;
- Encouraging the recruitment of teachers and other school staff with disabilities in regular schools.

- **Suggestions to improve Work and Employment:**
  - To review the framework legislation concerning the measure "employment internships" in order to establish a set of obligations on the part of the employer (notably regarding the creation of new jobs) once the specific financial support is ended;
  - To fulfil the employment quotas for persons with disabilities in the public sector;
  - To regulate employment quotas in the private sector;

- To increase the use of supported employment mechanisms, facilitating access to the open job market;
- To increase funding and the provision of inclusive vocational training for persons with disabilities and change the respective framework in order to allow greater flexibility in individual training paths (e.g. concerning the number of hours of training), according to the specific needs of each trainee;
- To improve the monitoring and enforcement mechanisms concerning the prohibition of discriminatory practices on the grounds of disability in the workplace;
- To reinforce the complaint and protection mechanisms regarding work-related harassment and violence and to raise awareness about disability issues among employee support structures (e.g. Ombudsman, unions, workers' committees);
- To raise employers' awareness about disability issues and to promote corporate social responsibility concerning the employment of persons with disabilities.

- **To fight discrimination of women and girls with disabilities by:**
  - To address the issue of multiple discrimination faced by girls and women with disabilities in the Portuguese legal and policy framework;
  - To strengthen research and intervention in order to combat violence against persons with disabilities, namely domestic violence;
  - To strengthen policies, programmes and support services related to the promotion of the sexual and reproductive rights of women with disabilities;
  - To promote the training of sexual and reproductive health practitioners on disability related issues.

- **Implementation and national monitoring of the CRPD**

  - To adopt a National Strategy for Disability that clearly states the objectives that will be pursued, the measures that will be undertaken and their indicators, budgets and deadlines, identifying the responsible actors, in order to promote an integrated disability policy that will contribute to the national implementation of the CRPD;

  - To increase the participation and representation mechanisms of disabled persons' organisations in the design, implementation and evaluation of disability public policy.

  - The national implementation of the CRPD has been limited by a number of factors including: the absence of a coherent and integrated strategy for disability at national level, the late and still incomplete establishment of the national mechanism for monitoring the Convention and in general by the limited participation and representation of disability organisations in the design and implementation of disability policy in the country. Go back to index

3. General recommendations and good practices for each stage of course development

In each Project Country general recommendations and good practices have been selected to support the visual/hearing impaired students' learning in HEIs study courses.

Per each stage of the course selected - Policy / Strategy of the course, Conception and Delivery of the course, Learners'

Evaluation/Assessment – quality indicators of the Strategic Planning and the related Daily Management of Operations have been identified.

Indicators for Policy/Strategy of the Course:

Strategic Planning	**Daily Management of Operations**
1. To clearly state, at the level of the strategy of the HEI, the need to support the inclusion of these students. 2. To dedicate a percentage of the total budget of the HEI to promote the inclusion of these students, by guaranteeing the access to the necessary resources to achieve it. 3. To promote, at the decision making level, the participation of representatives of these students.	a. To employ trained professionals to provide individual support to these students. b. To have trained staff to provide all the support that these students might need.
4. To promote partnerships with associations/organisations representing these students' disabilities aimed at: Ensuring quality staff training; Acquiring knowledge of technological advances; And assessing the quality of the support services provided.	c. To regularly train the academic community on the needs of these students in order to develop higher educational good practices.

Strategic Planning	Daily Management of Operations
5. To advise teaching staff on how to create an inclusive environment. 6. To promote positive attitudes among colleagues and the teaching and non-teaching staff. 7. Involve the student union in the inclusion of these students.	d. To provide advice to teaching staff on the needs of these students and of the adjustments to teaching strategies and materials. e. To have a professional who provides individualized educational support.
8. To promote KPIs that clearly monitor and control the different levels of services and teaching offered to these students.	f. To regularly monitor, through KPIs dedicated to this issue, the different levels of services and teaching offered to these students.

Indicators for Conception of the Course:

Strategic Planning	Daily Management of Operations
1. To assure that each course is in line with the requirements to guarantee the inclusion of these students.	a. To make available the adequate conditions to information accessibility for these students in all classes. b. To train the academic community involved in the specific courses where these students are enrolled.
2. To promote the consultation of these students as to the adjustments that need to be guaranteed both on an individual and collective basis, to assure their inclusion.	c. To regularly consult these students regarding possible needed improvements of accessibility conditions.
3. To define procedures to monitor regularly the course's developments and the daily offer, in terms of the inclusion policy adopted.	d. To regularly monitor the course's developments and the daily offer, in terms of the inclusion policy adopted.

Indicators for the Delivery of the Course:

Strategic Planning	Daily Management of Operations
1. To promote the adequate follow-up of the course delivery and of teaching practices by a trained professional.	a. To deliver course and class materials, including copies of the content of presentations, in advance to these students. b. To have an assistant to take notes in classes.

Specific Strategic Planning indicators and related Daily Management of Operations have been identified for the Delivery of the courses addressed to HEARING or VISUAL-IMPAIRED students.

For HEARING IMPAIRED students:

Strategic Planning	Daily Management of Operations
1. To assure that all information transmitted orally is made accessible. 2. To enhance visual presentation of information (graphs, diagrams, illustrations, etc.). 3. To provide captioning in videos and transcription of recordings making use of oral language, including environmental sounds whenever relevant to the understanding of the context, making clear who is speaking if there is more than one person. 4. To enable the use of the FM signal amplification	a. To have a specialized reference professional with competence in sign language, to welcome, accompany and guide these students and raise awareness of their teachers. b. To have sign language interpretation whenever it is asked for, letting the HI student position him/herself in front of the interpreter in the most appropriate location. c. Given that the HI student can only look at a stimulus at a time, the lecturer makes sure that the view of a particular material and its explanation do not occur simultaneously. d. To allow the use of voice to text processors during classes.

For VISUAL IMPAIRED students:

Strategic Planning	**Daily Management of Operations**
1. To assure that all information transmitted visually is made accessible. 2. To assure that visual presentation of information (graphs, diagrams, illustrations, maps, etc.) is described verbally and/or made available in advance with embossed or text versions. 3. To assure that content presentations follow the legibility guidelines needed for VI students. 4. To provide audio-description of videos that do not make use of oral language. 5. To promote proof reading by VI students of scanned course materials undertaken by the services. 6. To assure that libraries and similar services are equipped with assistive technology (hardware and software) that allow VI students to access information via braille, audio, digital or magnification.	a. To deliver materials in alternative formats (braille, large print, audio, digital, tactile representations), whenever they are asked for. b. To let the VI student choose the best place to sit in a face-to-face classroom c. To allow VI students to have access to electrical supply to run assistive technology in the classroom. d. To allow the use of voice recording during classes. e. To make available secure storage space for the assistive technologies used by the VI student. f. To have an assistant on study visits and field trips and in group study exercises. g. To train professionals involved in handling the adaptation of materials in the usage of the hardware and software needed for that purpose. h. To have an experienced O&M instructor, in case of need, to help VI students to become familiar with the campus and surrounding area.

Indicators for the Learners' Evaluation and Assessment:

Strategic Planning	Daily Management of Operations
1. To draw up individual plans, jointly with the student, the teaching and the support staff, that should cover possible adjustments to be made to the regular methods of assessment in face of the special needs of these students. 2. To assure, whenever possible, that these students are entitled to be evaluated by continuous assessment instead of end of semester/year exams.	a. To grant tolerance time on written tests/exams. b. In the above situation, whenever the additional time to an exam makes it excessively long, to divide it into parts to be sat separately.

Specific Strategic Planning indicators and related Daily Management of Operations have been identified for the Evaluation and Assessment of HEARING and VISUAL-IMPAIRED students.

Indicators for the Evaluation and Assessment of Learners with HEARING IMPAIRMENT:

Strategic Planning	Daily Management of Operations
1. To offer alternatives to the assessment made orally, as class participation, presentation of papers, oral examinations, etc. 2. To offer alternatives to assessment which requires listening and responding to audio input. 3. Depending on the nature of the course, to assure the possibility for the evaluation to be made by writing shorter written productions and with sign language interpretation	a) To provide a sign language interpreter in evaluation situations, whenever the student feels the need. b) To value content knowledge over grammatical competence in written assignments, considering that it does not correspond to the natural language of deaf students**.**

Indicators for the Evaluation and Assessment of Learners with VISUAL IMPAIRMENT:

Strategic Planning	**Daily Management of Operations**
1. To foresee the possibility of VI students to be evaluated by alternative exams assessing different skills, when interpretation of visual content is key to success in the conventional exam. 2. To assure that, in written exams, charts, graphs and other visual information are converted into text. 3. To assure that VI students are allowed to use assistive technology when other students are not permitted to use ICT.	a. To allow VI students to sit oral exams instead of written ones. b. To allow VI students to record oral responses to written questions.

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4. Good practices for the inclusion of hearing-impaired and visual-impaired students in HEIs

Good practices for the inclusion of hearing-impaired and visual-impaired students in HEIs were selected among the partner countries.

In the table below these practices are collected and organised per each courses stages – Policy / Strategy Course, Conception of and Delivery of the Course, Learners' Evaluation/Assessment - identifying indicators of Strategic Planning and the related Daily Management Operations.

Policy/Strategy of the Course in SWEDEN:

Strategic Planning	**Daily Management of Operations**
1. In Sweden, there is national legislation on inclusion that obliges HEIs to act accordingly, unifying the accessibility conditions. 2. In Sweden, HEIs dedicate 0,15% of their total budget to guarantee the necessary resources to achieve the inclusion of these students.	a) In Sweden Stockholm University has, on a yearly basis since 1993, been assigned by the government of Sweden to administer an additional grant for the HEIs that is given to partly cover high costs for personal pedagogical support for disabled students to remove or minimize barriers for learning. b) In Sweden Stockholm University is in cooperation with all HEIs in Sweden. This happens primarily in a network for cooperation between the Coordinators of the targeted pedagogical support at all universities (network called Coordinators' Network) and in a national reference group where 10 higher education institutions are represented (www.studeramedfunktionshinder.nu). c) In Sweden different institutions collaborate with local authorities to improve their capabilities to offer better assistance to those in need.

Policy/Strategy of the Course in PORTUGAL:

Strategic Planning	Daily Management of Operations
1. In Portugal, a HEI made available a brief tutorial on the adaptations needed for these students to be used by the teachers.	a) In Portugal, a HEI has a specialized teacher to advise these students' teachers in order to improve their pedagogical practices. b) In Portugal, a HEI has a specialized professional to assist these students in their everyday needs. c) In Portugal, some HEIs have other students as volunteers to assist these SEN students.

Policy/Strategy of the Course in ITALY:

Strategic Planning	Daily Management of Operations
1. In Italy, Law n.104/1992 - later integrated with law n.17/1999 - ensures the disabled people's social integration and highlighting their right to be informed and educated. The same law guarantees the provision of didactical and technical material, programs and specialized languages of adequately qualified staff (teaching or not). 2. In Italy, students with disability level equal/over 66%, are exonerated from taxes granted. This benefit needs to be validated by a certification of disability issued by a	a) In Italy, Uniform treatment regarding the right to higher education according to the art. 4 of Law December 2nd, 1991, n. 390 – guideline to set a minimum of useful standards to support the disabled students' accessibility to HEI's services (Decree of the President of the Council of Ministers 30 April 1997). It also foresees each university must to establish a special department - Servizi Disabilità Di Ateneo, SDDA – in charge of all services for disabled students.

medical/legal board at the local health authority (ASL-Azienda Sanitaria Locale) establishing that the student has a percentage of disability making him entitled to receive the exemption from taxes.	b) In Italy all HEIs provide a minimum of assistance services most REQUIRED by v/h impaired students: Tutoring, guidance service and psychological support, sign language interpreters; specialized tutors with expertise in study and social integration

In Slovenia, faculties with great number of students with disabilities, provide good support for them.

Indicators for Conception of the Course stage:

Strategic Planning	**Daily Management of Operations**
In Portugal, more and more courses are using ECT to enhance learning.	Not foreseen
Strategic Planning	**Daily Management of Operations**
Not foreseen	In Italy Universities have financial resources to implement services provided; staff's specific competences developed by training and professional experience.
Strategic Planning	**Daily Management of Operations**
In Sweden even if you are hearing-impaired or visually impaired, it is possible to further study at college or university. All institutions have the same system and have joint programs that provide: Sign language interpretation	Not foreseen
Strategic Planning	**Daily Management of Operations**

In Slovenia, a wide variety of obstacles, whether architectural, communicational, or any other, have already been fully or at least largely removed.	Not foreseen

Indicators for Delivery of the Course:

Strategic Planning	**Daily Management of Operations**
1. In Sweden you can apply for support in for example assistance while studying, or with different kind of auxiliary means that you may need. 2. In Sweden at all universities and institutions of higher education there is a contact person/coordinator, working with issues relating to educational support for students with disabilities. Examples of often available services are sign language interpreting, help with reading, note-taking, proofreading, personal assistants, certain technical aids for example in specially equipped rooms, extended time for exams, alternative exams, mentors or other individualized support measures, talking books and books in Braille.	a) In Portugal, many teachers were able to deliver class materials, including copies of the content of presentations, in advance to these students. b) In Portugal, other students frequently and voluntarily give them class notes c) In Italy, HEIs provide adaptations of courses and teaching materials using technological devices I support of V/I impaired students. d) In Italy, technological Poles network implemented by UNINETTUNO; Videoconferencing systems for oral exams e) In Slovenia, the Statute of the University of Ljubljana specifies criteria for acquiring the status of the students with special need, their rights and adjustments to the study process. f) In Slovenia some examples of the adjustments, which can be made to the study of the disabled students in Slovenia, are: exams outside given deadlines; exams only in oral/written form; an extension of the time of

	the written exams; adjustments of the exams; use of special tools; use of electronic material; sign language interpreter.

Specific **Daily Management of Operations** have been identified for courses addressed to HEARING and VISUAL IMPAIRED STUDENTS:

Daily Management of Operations	
FOR HEARING-IMPAIRED STUDENTS	1. In Portugal, some HEIs included in their budget expenses with sign language interpretation. 2. In Italy: Video lectures recorded using a simultaneous interpreter sign language and provision of text transcription; the LIS interpreting services during the lessons and the exams. 3. In Italy, by Uninettuno University (ROME) courses are offered in full-e-learning model adaptable and flexible in terms of space and time 4. In Slovenia, public and higher education institutions with concession should provide a sign language interpreter for deaf students or enable them to communicate in a different manner, which are acceptable for them, based on individualized plan.
FOR VISUAL-IMPAIRED STUDENTS	1. In Italy: enlargers, digitization of images and digital books, tablets, multimedia classrooms for streaming, voice synthesizer (voice-box), braille printers,

	2. In Italy, by Uninettuno University (ROME) courses are offered in full-e-learning model adaptable and flexible in terms of space and time

Indicators for Learners Evaluation/Assessment stage:

Strategic Planning	**Daily Management of Operations**
In Slovenia, at the University of Ljubljana, by its Statute, students with disabilities have the right to additional exam periods and can progress to the higher study year exceptionally, even if they don't fulfil all progression requirements.	Not foressen
Strategic Planning	**Daily Management of Operations**
Not foreseen	For students with visual impairment, in Italy HEI use videoconferencing systems for oral exams

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5. Recommendations for different issues on any course's access and frequency

5.1 Adjustments – physical accessibility

An accessible building is one that is safe and functional. When a building conforms to best practice in terms of the needs of people with disabilities, such as a tactile surface at the top of the stairs and corridors with non-slip flooring, it becomes a safer environment for all. While a 3-D model of the campus will aid a large number of students and visitors to understand the layout and not just the VI students.

In order to assess the accessibility of its premises a HEI should adopt a two-pronged approach. On the one hand it should check that its buildings comply with national legislation on accessibility, and on the other it should consult with its students and staff that have reduced mobility in order to identify barriers. In some cases the number of adjustments required to comply with legislation may place too great a burden on the annual budget and the HEI should consult the said students and staff in order to set priorities. The consultation process will also help to overcome any potential conflicts between the needs of the various disability groups, for example if a VI student proposes a mat be placed in the corridor in front of a particular office, wheelchair users will want to have a say in the type of mat to be used.

Particular attention should be given to stairs. At the top and bottom of the stairs there should be a change in surface texture and colour to alert users that they are approaching stairs. Each step should have anti-slip material in a contrasting colour on the nose. Handrails, on both sides of the stairs and down the middle of especially wide staircases, should provide genuine support and extend beyond the first and last step. (Some handrails stop one or two steps before the end and the user may stumble if he/she is unaware of this.)

Concern should also be shown to the accessibility of the surrounding area. For instance, is there a safe and easy to follow route from the nearest bus stops and train stations? If students and staff are required to walk through a garden or public park to reach the HEI do

the plants overhang the path? Naturally the HEI is not responsible for the surrounding area but it can use its influence with the local council and other bodies to improve access to its buildings.

5.1.1 Adjustments – orientation

The original design of the building may help or hinder the user. Some buildings have entrances that are easy to find with or without vision (a path or stairs points the way or a porch or portico provides an acoustic clue). On the other hand when all the corridors are painted the same colour and have the same width it can be more difficult to work out one's precise location.

The HEI should consult VI students to understand if it should introduce new landmarks (reference points), for example a change in the surface near the entrance, different door handles for male and female WCs, or an aromatic plant next to the student services office.

5.1.2 Adjustments – lighting

Without light there is no vision, but we need to control both natural light and artificial lighting if we are to create an environment that can meet the needs of all users. This means that all windows should be fitted with blinds or other devices that provide control over the quantity of light entering the building, and it means being able to regulate the intensity of all artificial lighting. VI students will find it easier to circulate in buildings where the lighting level is regular and where there are no areas of harsh sunlight separated by dark shadows. As a rule VI students' eyes take longer to react to changes in lighting levels and both bright and dark areas can end up concealing obstacles and causing accidents.

Teaching staff should be aware that HVI students may need to sit in a specific place in the classroom in order to be able to lip read or simply see better. This place may well change according to the time of day and the position of the sun and the student's specific needs. While administrative staff should understand that some students will find the lighting at the service counter too intense or too weak. If the lighting above the counter cannot be

adjusted, staff should be prepared to move into the shadows or switch on a table lamp in response to the student's needs.

5.1.3 Adjustments – legibility

The legibility of documents, presentations and signage is dependent upon the size and type of letter used, the colour contrasts and the background. For example, a sign's background should have a matt finish in a colour that contrasts strongly both with the wall and the letters. While the information should be provided in a simple font (no 3-D effects, no unusual shaped letters) or by way of symbols in common usage. The sign should be located at eye level in a standard position in relation to the door or route it identifies. The surrounding area should be free of obstacles so that the user may approach the sign. Suitable font size is determined by the distance from which the sign is likely to be read and designers should follow national legislation or codes of good practice when selecting font sizes and fonts.

When choosing fonts and sizes for exam papers and other documents distributed to students, teaching staff should consult the VI students concerned as they are likely to know which combinations they find most legible. Since all such documents are produced on a computer the font and point size can be personalised with a couple of key strokes.

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5.2 Power Point Guidelines to promote accessibility (ACAPO)

ACAPO understands that PowerPoint presentations are a feature of conferences and are a useful tool for many people. Naturally at an event that looks at the accessibility from the viewpoint of visually impaired and deaf university students not all those present will find it easy to read the presentations. We have written these recommendations so as to increase the number of people who can benefit from the visual information the speakers present.

Even if we just consider the needs of visually impaired persons, we cannot define a font and letter size, nor a colour contrast that will be legible to all of them. On the other hand we are

aware that some speakers may feel obliged to their organisation's house style and colours, so for this reason our recommendations allow for a certain amount of creativity.

5.2.1 Letter size and quantity of text

1. Titles in 36 pt or larger.
2. Text in 32 pt or larger.
3. Exception: if you wish to include information that is only relevant to the speaker (for example the number of the slide), you may use very small letters.
4. You can write around 30 characters per line using 32pt letters, which is considered to be a good length.
5. Avoid dividing words at the end of a line.
6. It is good practice to include no more than 6 or 7 lines of text per slide.
7. When using bullets you should finish each line with a punctuation mark. This is important if you allow people to download your presentation as it will help those people who use a screen reader to identify the different lines of text, as generally speaking screen readers do not read bullets.

5.2.2 Font

- Use a sans serif font, such as Helvetica, Arial, Tahoma, Verdana.
- Avoid italics – if you wish to highlight a word use bold.
- Use only one font per slide.

5.2.3 Colour contrast

It is not possible to define a colour combination that maximises legibility for all in all situations. We recommend using a dark background and light coloured text, for example yellow letters on a dark blue background our white letters on a dark red background.

DO NOT USE the following combinations:

- Red and black; red and green, dark blue and black, dark green and black; two shades of grey.
- The background should be plain and preferably in a single colour.

5.2.4 Pictures, charts and tables

Some pictures are merely decorative and provide no additional information. In most cases we do not need to describe such pictures during the presentation nor in a version available for download. However, if a picture provokes a reaction from the audience (laughter, expressions of sympathy, etc.) the speaker should describe the picture in order to explain the reaction.

ACAPO can help you devise descriptions for those pictures, charts and tables that provide additional information.

If it is necessary to analyse a complex graph or chart, we recommend distributing copies beforehand. ACAPO can help you produce accessible versions.

5.2.5 Animation

Use the minimum amount of animation because it can be very confusing for people with low vision or dyslexia. Choose the simple effects such as appear, wipe from left, peek in and ascend.

You could consider using sounds to indicate that the slide has changed, although many of the PowerPoint sounds become irritating after a while.

5.2.6 Template

If you expect to distribute or publish your presentation use a Slide Layout Design template (with specific sections for the title and the text) rather than use a blank slide with added text boxes. That way you make life easier for those who read and navigate with a screen reader.

If you intend to convert your presentation into a Word document, on the "send to" menu use the "outline" option as it is compatible with screen readers. If you employ an option that combines the slides and the notes section, some screen readers will only read the notes section.

Note: Sometimes the contents of text boxes disappear when a PowerPoint document is converted into a Word document, which is why we recommend using a Slide Layout Design template. Go back to index

5.3 Other Recommendations[26]

5.3.1 Recommendations of a general nature

1. HEIs should follow the principles given by the Swedish example and set aside a certain percentage funds from the State to provide assistance to students with disabilities.

2. All HEIs[27] (and not just those that already have disabled students) should be required to draw up action plans covering how they will set up new or improve existing services.

3. All HEIs (and not just those that already have disabled students) should draw up regulations covering the rights of students with disabilities and the services available to them.

4. HEIs should publish accommodations (adjustments) made for students with disabilities on their websites and disclose their willingness (legal obligation) to accept enrolments from students with disabilities in all recruiting and marketing materials.

5. HEIs should strive to ensure sports and social facilities are inclusive.

6. HEIs should strive to create a culture of inclusion among teaching, administrative and support staff.

7. Administrative staff should be able to assist candidates with disabilities to complete and submit applications for courses, scholarships and transfers.

8. Student counsellors and staff providing psychological or similar support should receive disability awareness training.

[26] In these recommendations the department, office or other unit that provides specific support to students with disabilities is referred to simply as the Support Service. Also, on purpose, a list of assistive technology has not been included as some recommendations could quickly become dated and because some equipment and software will be more readily available in some countries than others. Furthermore, the nature of the courses taught at the HEI may affect the choice of most suitable equipment.

[27] The expression "All HEIs" is used because HEIs should take this step regardless of the number of students with disabilities enrolled at the current time. It is a breach of the UN Charter to argue they provide no services because they have no students with disabilities, since the absence of services is a reason why such students were obliged to go elsewhere.

9. Volunteers employed to provide individual support to students and to produce course materials in alternative formats should receive disability awareness training.

10. Support Service staff should receive in-depth training in the needs of VI students and higher educational good practice.

11. HEIs should enter into partnerships with organisations representing people with disabilities so as to ensure quality staff training, acquire knowledge of technological advances and assess the quality of the support services provided.

12. Teaching staff should receive advice as to how to adjust their teaching strategies and materials in general terms so as to create an inclusive environment and in regard to the needs of specific students.

13. Students with disabilities should be consulted as to the accommodations (adjustments) to be made on an individual and collective basis.

5.3.2 Recommendations regarding VI students.

1. The Support Service should be able to advise teaching staff as well as students.

2. The Support Service should be able to provide course material, exam papers and additional publications in alternative formats (braille, large print, and audio, and digital) and produce tactile representations of visual material.

3. When VI students are obliged to scan course material that is not available in a digital format, the Support Service should be willing to undertake proof reading.

4. The HEI should employ either, directly or as a consultant, a specialist teacher who has taught VI students in secondary and/or higher education to advise HE teachers on adaptations to course materials, teaching strategies and exams.

5. Teaching strategies should be adjusted to meet VI students' needs and so maximise their learning potential. Accommodations (adjustments) may include:

    a) preparing PowerPoints and other presentations in particular colours and using particular fonts and font sizes

b) providing the student with a copy of the presentation to be viewed on a personal device during the lesson;
c) providing embossed or text versions of maps, charts and other graphic materials in advance;
d) allowing student to choose the best place to sit;
e) access to an electrical supply to run assistive technology.

6. Students should be entitled to record lessons.

7. Students should be entitled to be accompanied by a personal assistant to take notes in class, on study visits and field trips, and in group study exercises.

8. The HEI should provide secure storage space for VI students' assistive technology.

9. Methods of assessment should be adapted to match the student's capacities which may include:

a) oral instead of written exams;
b) charts and graphs converted into text in written exams;
c) the right to use assistive technology when other students are not permitted to use ICT;
d) the possibility of recording oral responses to written questions;
e) continuous assessment in place of end of semester/year exams;
f) alternative exams assessing different skills when interpretation of visual content is key to success in the conventional exam (for example, when students with normal vision are expected to interpret x-rays, VI students can be asked to interpret radiologist's report);

10. The adjustments made to the methods of assessment should be the subject of individual plans drawn up jointly and in advance by the student and teaching staff concerned and the Support Service.

11. Students should be given more time to complete written exams in proportion to the specified time and the nature of the subject matter. It may be necessary to divide long exams into parts to be sat separately.

i. [Note: an extra 30 minutes may be appropriate when the exam is two hours long and the questions are short statements, but will be insufficient if the exam is three hours long and requires regular consultation of charts, graphs, maps or other information included in the question paper. It has been shown that VI students may need 50% more time in the latter type of exam. So if a three hour exam becomes a four and a half hour exam, it should be split into two parts.]

12. Libraries and similar services should be equipped with assistive technology that allows students to access information via braille, audio, digital or magnification. The Support Service should be able to provide training in the use of the respective hardware and software, although it should seek to use equipment and programs in common usage.

13. An experienced O&M instructor should be available to help VI students become familiar with the campus and surrounding area.

14. General information about the HEI's facilities, service and events should be available in alternative formats (braille, large print, and audio, and digital). Go back to index

PART V – METHODOLOGY PROPOSED TO IMPLEMENT INCLUSION POLICIES

Inclusion should not be just a question of willingness. To become a reality, inclusion of visual or hearing impaired students in HE must be promoted through real policies, that should be implemented and discussed widely in each HEI, involving all the academic staff, from the bottom to the higher responsible in a top-down approach. Thus, to support the implementation of these recommendations, we propose the reflection on several issues, accordingly to the development stage of each higher education offer, either at the highest level of the HEI, at level of an entire course, or just at the level of each curricular unit, in order to assess accessibility levels offered for these students.

These guidelines, presented as a sort of check list, should be considered mainly to raise awareness and promote policy discussions within HEI, in order to increase the effectiveness of inclusion policies in each HEI and thus, promote the inclusion of visual or hearing-impaired persons in HE. Go back to index

1. Check list on accessibility for hearing-impaired and visual-impaired students in HEIs

In order to support the visual/hearing impaired students' learning in HEIs study courses quality indicators are proposed per each stage of the course - Policy / Strategy of the course, Conception and Delivery of the course, Learners' Evaluation and Assessment.

Per each stage are also proposed quality indicators of the Strategic Planning and the related Daily Management of Operations.

Indicators for the Policy/Strategy of the Course

Strategic Planning	**Daily Management of Operations**
1. At the level of the strategy or policy guiding documents of the HEI, is it clearly stated the need to support the inclusion of these students? 2. Does the total budget of the HEI dedicate a percentage to promote the inclusion of these students, by guaranteeing the access to the necessary resources to achieve it (e.g. special equipment; psychological support; training, etc.)? 3. Is the participation of representatives of these students promoted, at the decision making level?	a) Is there an office dedicated to the support of students with special educational needs? b) Is there trained staff to provide all the support that these students might needed?
4. Does the HEI promote partnerships with associations/organisations representing these students disabilities aiming at: – Ensuring quality staff training? – Acquiring knowledge of technological advances?	c) The academic community is regularly trained on the needs of these students in order to develop higher educational good practices? d) The teaching staff is advised on the needs of these students and on the adjustments to teaching strategies and materials?

Strategic Planning	**Daily Management of Operations**
– Assessing the quality of the support services provided? 5. Is the teaching staff advised on how to create an inclusive environment? 6. Are positive attitudes among colleagues and the teaching and non-teaching staff promoted? 16. Is the student union involved in the inclusion of these students?	e) Is there a professional who provides individualized educational support?
8. Are KPIs that clearly monitor and control the different levels of services and teaching offered to these students promoted?	f) Are the different levels of services and teaching offered to these students regularly monitored, through KPIs dedicated to this issue?

Indicators for the Conception of the Course:

Strategic Planning	Daily Management of Operations
1. Is it assured that each course is in line with the requirements to guarantee the inclusion of these students?	a) Are the adequate conditions to information accessibility for these students made available in all classes? b) Is the academic community involved in the specific courses where these students are enrolled trained?
2. Is the consultation of these students as to the adjustments that need to be guaranteed both on an individual and collective basis, to assure their inclusion, promoted?	c) Are these students regularly consulted regarding possible needed improvements of accessibility conditions?
3. Are procedures to monitor regularly the course's developments and the daily offer defined, in terms of the inclusion policy adopted?	d) Are these students regularly consulted regarding possible needed improvements of accessibility conditions?

Indicators for the Delivery of the Course:

Strategic Planning	Daily Management of Operations
1. Is the adequate follow-up of the course delivery and of teaching practices by a trained professional promoted?	a) Are course/class materials, including copies of the content of presentations delivered in advance to these students? b) Do students have an assistant to take notes in classes?

Specific **Strategic Planning** indicators and **Daily Management of Operations** for the Delivery of the Course have been identified for courses addressed to HEARING or VISUAL IMPAIRED STUDENTS.

For HEARING-IMPAIRED STUDENTS:

Strategic Planning	**Daily Management of Operations**
1. Is it assured that all information transmitted orally is made accessible? 2. Is the visual presentation of information (graphs, diagrams, illustrations, etc.) enhanced? 3. Are captioning in videos and transcription of recordings making use of oral language, including environmental sounds whenever relevant to the understanding of the context, making clear who is speaking if there is more than one person, provided? 4. Is the use of the FM signal amplification system enabled, when needed?	a) Is there a specialized reference professional with competence in sign language, to welcome, accompany and guide these students and raise awareness of their teachers? b) Is there sign language interpretation whenever it is asked for? c) Given that the HI student can only look at a stimulus at a time, does the lecturer make sure that the view of a particular material and its explanation do not occur simultaneously? d) Is the use of voice to text processors allowed during classes?

For VISUAL-IMPAIRED STUDENTS:

Strategic Planning	Daily Management of Operations
1. Is it assured that all information transmitted visually is made accessible? 2. Is it assured that visual presentation of information (graphs, diagrams, illustrations, maps, etc.) is described verbally and/or made available in advance with embossed or text versions? 3. Is it assured that the content presentations follow the legibility guidelines needed for VI students? 4. Is audio-description of videos that do not make use of oral language provided? 5. Is proof reading by VI students of scanned course materials undertaken by the services promoted? 6. Is it assured that libraries and similar services are equipped with assistive technology (hardware and software) that allow VI students to access information via braille, audio, digital or magnification?	a) Are materials in alternative formats (braille, large print, audio, digital, tactile representations) delivered, whenever they are asked for? b) Can the VI student choose the best place to sit in a face-to-face classroom? c) Are VI students allowed to have access to electrical supply to run assistive technology in the classroom? d) Is the use of voice recording allowed during classes? e) Is secure storage space for the assistive technologies used by the VI student made available? f) Do VI students have an assistant on study visits and field trips and in group study exercises? g) Are professionals involved in handling the adaptation of materials trained in the usage of the hardware and software needed for that purpose? h) Is there an experienced O&M instructor, in case of need, to help VI students to become familiar with the campus and surrounding area?

Indicators for Learners' Evaluation/Assessment:

Strategic Planning	**Daily Management of Operations**
1. Are individual plans drawn up, jointly with the student, the teaching and the support staff, covering possible adjustments to be made to the regular methods of assessment in face of the special needs of these students? 2. Is it assured, whenever possible, that these students are entitled to be evaluated by continuous assessment instead of end of semester/year exams?	a) Is tolerance time granted on written tests/exams? b) In the above situation, whenever the additional time to an exam makes it excessively long, is it divided into parts to be sat separately?

Specific **Strategic Planning** indicators and **Daily Management of Operations** for the **Learners' Evaluation/Assessment** have been identified for courses addressed to HEARING and VISUAL IMPAIRED STUDENTS.

For HEARING-IMPAIRED STUDENTS:

Strategic Planning	Daily Management of Operations
1. Are alternatives to the assessment made orally, as class participation, presentation of papers, oral examinations, etc., offered? 2. Are alternatives to assessment which requires listening and responding to audio input offered? 3. Depending on the nature of the course, is the possibility for the evaluation to be made by writing shorter written productions and sign language interpretation assured?	a) Is a sign language interpreter provided in evaluation situations, whenever the student feels the need? b) Is content knowledge valued over grammatical competence in written assignments, considering that it does not correspond to the natural language of deaf students?

For VISUAL-IMPAIRED STUDENTS:

Strategic Planning	Daily Management of Operations
1. Is the possibility of VI students to be evaluated by alternative exams assessing different skills foreseen, when interpretation of visual content is key to success in the conventional exam? 2. Is it assured that, in written exams, charts, graphs and other visual information are converted into text? 3. Is it assured that VI students are allowed to use assistive technology when other students are not permitted to use ICT?	a) Are VI students allowed to sit oral exams instead of written ones? b) Are VI students allowed to record oral responses to written questions?

Indicators for the Evaluation of the Course:

Strategic Planning	**Daily Management of Operations**
1- Are there procedures to evaluate the course including KPIs regarding the inclusion of disabled students?	a. Are gaps on KPIs referring to inclusion, originating correction measures?
2- Are there evaluation procedures that consider the results of the evaluation feedback on the improvement of the course offer for the next year, comprehending the inclusion of disabled students?	b. Are procedures defined to open the new course offer, considering the correction measures decided to improve the inclusion level of the course?
3- Is it usual that the evaluation procedures implemented comprehend improvements on the level of inclusion of disabled students?	

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2. Methodology proposed to assess the level of inclusion of a given course

The methodology proposed to assess the level of inclusion of a given course, follow the analysis of the application of the check list for each specific course offer of a HEI. However, to be more effective, it is advisable that whenever possible, this analysis should consider the opinion of the HEI's responsible persons, and particularly those that, at the level of the rectorate conceive and define how inclusion policies should be implemented at the different levels of the HEI.

Also, it is crucial that this methodology, in its initial stage of use, is tested through direct, face-to-face (although could be through Skype of some videoconferencing methodology) interviews, the sole situation where we could receive the direct and adequate feedback from the persons that will answer these first questionnaires in each HEI chosen for this first tests, that will allow, in a further step, to improve the methodology chosen and the questions elected for this assessment.

We follow the check list previously presented, using a scale for answers that intends to promote dialogue towards the development of inclusion policies, rather than simply evaluate, or even rank, courses regarding their levels of inclusion for visual or hearing-impaired persons.

Indicators about the Policy/Strategy of the Institution regarding Inclusion (weight in total: 20%)					
Strategic Planning (40%)	**Not executed**	**Not planned but occasionally executed**	**Partially planned and executed**	**Planned and systematically executed**	**Planned, systematically executed and evaluated**
1.1. At the level of the strategy or policy guiding documents of the HEI, is it clearly stated the need to support the inclusion of these students?					
1.2. Does the total budget of the HEI dedicate a percentage to promote the inclusion of these students, by guaranteeing the access to the necessary resources to achieve it (e.g. special equipment; psychological support; training, etc.)?					
1.3. Is the participation of representatives of these students promoted, at the decision making level?					
1.4. Does the HEI promote partnerships with associations/organisations representing these students disabilities aiming at:					
a. Ensuring quality staff training?					
b. Acquiring knowledge of technological advances?					
c. Assessing the quality of the support services provided?					
1.5. Is the teaching staff advised on how to create an inclusive environment?					
1.6. Are positive attitudes among colleagues and the teaching and non-teaching staff promoted?					
1.7. Is the student union involved in the inclusion of these students?					
1.8. Are KPIs that clearly monitor and control the different levels of services and teaching offered to these students promoted?					
Daily Management of Operations (60%)					
1.a) Is there an office dedicated to the support of students with special educational needs?					
1.b) Is there trained staff to provide all the support that these students might needed?					
1.c) The academic community is regularly trained on the needs of these students in order to develop higher educational good practices?					
1.d) The teaching staff is advised on the needs of these students and on the adjustments to teaching strategies and materials?					
1.e) Is there a professional who provides individualized educational support?					
1.f) Are the different levels of services and teaching offered to these students regularly monitored, through KPIs dedicated to this issue?					

Indicators regarding Course Conception (20%)					
Strategic Planning (40%)	**Not executed**	**Not planned but occasionally executed**	**Partially planned and executed**	**Planned and systematically executed**	**Planned, systematically executed and evaluated**
2.1. Is it assured that each course is in line with the requirements to guarantee the inclusion of these students?					
2.2. Is the consultation of these students as to the adjustments that need to be guaranteed both on an individual and collective basis, to assure their inclusion, promoted?					
2.3. Are procedures to monitor regularly the course's developments and the daily offer defined, in terms of the inclusion policy adopted?					
Daily Management of Operations (60%)	**Not executed**	**Not planned but occasionally executed**	**Partially planned and executed**	**Planned and systematically executed**	**Planned, systematically executed and evaluated**
2.a) Are the adequate conditions to information accessibility for these students made available in all classes?					
2.b) Is the academic community involved in the specific courses where these students are enrolled trained?					
2.c) Are these students regularly consulted regarding possible needed improvements of accessibility conditions?					
2.d) Are these students regularly consulted regarding possible needed improvements of accessibility conditions?					

Indicators regarding the Delivery of the Course (25%)

Strategic Planning (40%)	**Not executed**	**Not planned but occasionally executed**	**Partially planned and executed**	**Planned and systematically executed**	**Planned, systematically executed and evaluated**
3.1. Is the adequate follow-up of the course delivery and of teaching practices by a trained professional promoted?					
Daily Management of Operations					
3.a) Are course/class materials, including copies of the content of presentations delivered in advance to these students?					
3.b) Do students have an assistant to take notes in classes?					

Specific **Strategic Planning** indicators and **Daily Management of Operations** for the Delivery of the Course esecifically addressed to HEARING and VISUAL IMPAIRED STUDENTS.

For HEARING-IMPAIRED STUDENTS:

Strategic Planning (40%)	**Not executed**	**Not planned but occasionally executed**	**Partially planned and executed**	**Planned and systematically executed**	**Planned, systematically executed and evaluated**
3.2.1. Is it assured that all information transmitted orally is made accessible?					
3.2.2. Is the visual presentation of information (graphs, diagrams, illustrations, etc.) enhanced?					
3.2.3. Are captioning in videos and transcription of recordings making use of oral language, including environmental sounds whenever relevant to the understanding of the context, making clear who is speaking if there is more than one person, provided?					
3.2.4. Is the use of the FM signal amplification system enabled, when needed?					
Daily Management of Operations (60%)					
3.c.1) Is there a specialized reference professional with competence in sign language, to welcome, accompany and guide these students and raise awareness of their teachers?					
3.c.2) Is there sign language interpretation whenever it is asked for?					
3.c.3) Given that the HI student can only look at a stimulus at a time, does the lecturer make sure that the view of a particular material and its explanation do not occur simultaneously?					
3.c.4) Is the use of voice to text processors allowed during classes?					

For VISUAL-IMPAIRED STUDENTS:

Strategic Planning (40%)	**Not executed**	**Not planned but occasionally executed**	**Partially planned and executed**	**Planned and systematically executed**	**Planned, systematically executed and evaluated**
3.3.1. Is it assured that all information transmitted visually is made accessible?					
3.3.2. Is it assured that visual presentation of information (graphs, diagrams, illustrations, maps, etc.) is described verbally and/or made available in advance with embossed or text versions?					
3.3.3. Is it assured that the content presentations follow the legibility guidelines needed for VI students?					
3.3.4. Is audio-description of videos that do not make use of oral language provided?					
3.3.5. Is proof reading by VI students of scanned course materials undertaken by the services promoted?					
3.3.6. Is it assured that libraries and similar services are equipped with assistive technology (hardware and software) that allow VI students to access information via braille, audio, digital or magnification?					
Daily Management of Operations (60%)	**Not executed**	**Not planned but occasionally executed**	**Partially planned and executed**	**Planned and systematically executed**	**Planned, systematically executed and evaluated**
3.d.1) Are materials in alternative formats (braille, large print, audio, digital, tactile representations) delivered, whenever they are asked for?					
3.d.2) Can the VI student choose the best place to sit in a face-to-face classroom?					
3.d.3) Are VI students allowed to have access to electrical supply to run assistive technology in the classroom?					
3.d.4) Is the use of voice recording allowed during classes?					

Indicators for Learners' Evaluation/Assessment (20%)

Strategic Planning (40%)	**Not executed**	**Not planned but occasionally executed**	**Partially planned and executed**	**Planned and systematically executed**	**Planned, systematically executed and evaluated**
4.1. Are individual plans drawn up, jointly with the student, the teaching and the support staff, covering possible adjustments to be made to the regular methods of assessment in face of the special needs of these students?					
4.2. Is it assured, whenever possible, that these students are entitled to be evaluated by continuous assessment instead of end of semester/year exams?					
Daily Management of Operations (60%)	**Not executed**	**Not planned but occasionally executed**	**Partially planned and executed**	**Planned and systematically executed**	**Planned, systematically executed and evaluated**
4.a) Is tolerance time granted on written tests/exams?					
4.b) In the above situation, whenever the additional time to an exam makes it excessively long, is it divided into parts to be sat separately?					

Specific **Strategic Planning** indicators and **Daily Management of Operations** for the **Learners' Evaluation/Assessment** have been identified for courses addressed to HEARING and VISUAL IMPAIRED STUDENTS.

For HEARING-IMPAIRED STUDENTS:

Strategic Planning (40%)	**Not executed**	**Not planned but occasionally executed**	**Partially planned and executed**	**Planned and systematically executed**	**Planned, systematically executed and evaluated**
4.3.1. Are alternatives to the assessment made orally, as class participation, presentation of papers, oral examinations, etc., offered?					
4.3.2. Are alternatives to assessment which requires listening and responding to audio input offered?					
4.3.3. Depending on the nature of the course, is the possibility for the evaluation to be made by writing shorter written productions and sign language interpretation assured?					
Daily Management of Operations (60%)	**Not executed**	**Not planned but occasionally executed**	**Partially planned and executed**	**Planned and systematically executed**	**Planned, systematically executed and evaluated**
4.c.1) Is a sign language interpreter provided in evaluation situations, whenever the student feels the need?					
4.c.2) Is content knowledge valued over grammatical competence in written assignments, considering that it does not correspond to the natural language of deaf students?					

For VISUAL-IMPAIRED STUDENTS:

Strategic Planning (40%)	**Not executed**	**Not planned but occasionally executed**	**Partially planned and executed**	**Planned and systematically executed**	**Planned, systematically executed and evaluated**
4.4.1. Is the possibility of VI students to be evaluated by alternative exams assessing different skills foreseen, when interpretation of visual content is key to success in the conventional exam?					
4.4.2. Is it assured that, in written exams, charts, graphs and other visual information are converted into text?					
4.4.3. Is it assured that VI students are allowed to use assistive technology when other students are not permitted to use ICT?					
Daily Management of Operations (60%)	**Not executed**	**Not planned but occasionally executed**	**Partially planned and executed**	**Planned and systematically executed**	**Planned, systematically executed and evaluated**
4.d.1) Are VI students allowed to sit oral exams instead of written ones?					
4.d.2) Are VI students allowed to record oral responses to written questions?					

Indicators for the Evaluation of the Course (15%)					
Strategic Planning (400%)	**Not executed**	**Not planned but occasionally executed**	**Partially planned and executed**	**Planned and systematically executed**	**Planned, systematically executed and evaluated**
5.1. Are there procedures to evaluate the course that include KPIs regarding the inclusion of disabled students?					
5.2. Are there evaluation procedures that consider the results of the evaluation feedback on the improvement of the course offer for the next year, comprehending the inclusion of disabled students?					
5.3. Is it usual that the evaluation procedures implemented comprehend improvements on the level of inclusion of disabled students?					
Daily Management of Operations (60%)	**Not executed**	**Not planned but occasionally executed**	**Partially planned and executed**	**Planned and systematically executed**	**Planned, systematically executed and evaluated**
a. Are gaps on KPIs referring to inclusion, originating correction measures?					
b. Are procedures defined to open the new course offer, considering the correction measures decided to improve the inclusion level of the course?					

The methodology defined can be, from our point of view, used for any type of handicap, with small adaptations.

We are confident that this represent just a first step in the direction for inclusion, but a strong and important one, given the desert observed in this sense.

Score averages should be figured out for each of the five dimensions of the questionnaire, and a composite final result can be calculated for the course.

Results of each analysis will be presented in a kind of spider graph, considering the dimensions of analysis defined, and the worst results aim as a principle, to promote discussion within HEI to improve their levels of inclusion for the course analysed.

Composed scores can be defined in a later stage for the inclusion of the different courses of the HEI…

3. Conclusions

In the end of the present handbook, it becomes clear that there is a long way to go to definitely promote inclusion of visual or hearing-impaired (or simply, disabled) students in Higher Education.

Having given the principles and the tools to promote this inclusion, it is important to emphasize some basic policies and principles that should guide the framework of action of HEI in this sense.

These can be translated in simple recommendations that in turn can be resumed in five principles:

- Need for integrated policies (or recommendations to promote them), aligned programs and clear incentives at the EU level, at the national level and at the HEI level, to promote inclusion of disabled students in HE
- Need to spread-out good practices, promoting share of knowledge, good practices and funding issues on inclusion actions, practices, and mechanisms
- Need for financial resources defined at the highest level of the institutions, if needed on a mandatory basis
- Need to improve the involvement of HEI's staff (professors and other support staff, including the awareness of HEI's managers/responsible)
- Need to increase the overall awareness and involvement of the academic community, for these issues (especially classmates and families and other persons from the outside of the HEI)

Although presented on an isolated basis, these recommendations must be addressed together, since both the importance, and the difficulty of the task turns it just possible to reach success if institutions (whether EU institutions, national institutions, or even the proper HEI from the different European countries) join efforts to this end.

We believe that this handbook of good practices and recommendations is just a small step in this long journey, however we are confident that this is a solid step in that way, and expect that this project may be fruitful in actions and respective results to this noble end.

4. Brief final note and future research

We are conscientious that this handbook represents a work in progress. From the testing of the proposed methodology, certainly important improvements can result to the overall knowledge and attitude of HEI towards inclusion of disabled students in their course offers.

Also, as far as these practices and results are promoted and gain visibility, it is wise to believe that more results will come out from the shadow, both from those existing not known projects, and also from new projects that fortunately should start being developed in these fields.

Finally, in some domains of our approach we are aware that we are starting some new fields of research. So, as any explorer, it is normal that we could have made some mistakes in our presentations, either by lack of information or even lack of specific knowledge in such complex fields as those we are dealing with. So, all the project's team is available first to clarify and then to correct, if that's the case, any possible mistake that the reader can find through the reading of the present handbook.

One thing we are sure, we've done our best to reach these results, and we'll continue to work in this noble objective that represents an issue of human rights, that is to promote the inclusion of disabled persons in Higher Education.

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[Consultado em 6 de junho de 2012]. Go back to index

d. Benchmarking and similar projects

Different types of projects have been developed in the past few years, to promote social inclusion, in the countries involved in ISOLearn. Being the present handbook dedicated to recommendations and good practices, we consider that it is important to present a brief reference to the main projects in these fields, in order to provide a broad vision of the existent current framework. Hence we have divided the several initiatives into three categories: i) projects for visual and hearing-impaired persons; ii) reports and studies on

disabilities; and iii) promotion of accessibility by local governments or city councils.

2.1 Projects developed for visual and hearing-impaired:

- **ColorADD:** Created in 2010, this color identification system is targeted for colorblind people, which are estimated to represent 350 million people, that is, 10% of the male population worldwide. The ColorADD code is based on three graphic symbols representing the three primary colors. Using the "Color Addition Theory" taught in early school years, the symbols are developed and the entire color pallet can be graphically identified. This system turns ColorADD into a unique, universal, inclusive and non-discriminative language. More information on the project is available on the website www.coloradd.net.

- **Coro "Mãos que Cantam":** This project, created in 2010, is an initiative developed in order to fully include hearing-impaired students in academic life. The project combines its artistic component with an educative mission to promote the inclusion of persons hearing-impaired in schools through music. More information on the project is available on the website http://www2.ucp.pt/site/custom/template/ucptpl_srv.asp?sspageID=3204&lang=1.

- **Unidade Acesso (Access Unit):** The Access Unit, a civil and public society for digital inclusion, was created by the Portuguese Government as part of the "Portuguese Digital Agenda" through FCT (Technology and Science Foundation) to support the adoption of open standards in the computer systems of the State (Law nr. 36/2011) and the Digital Interoperability National Regulation (RCM nr. 91/2012). Directed for HEI and for students who desire to provide information in accessible formats. More information on the project is available on the website www.acessibilidade.gov.pt.

- **Places:** This project aims to provide knowledge on how to produce digital content accessible to students with special needs. The Oporto University developed this platform where it is possible to find tutorials in various formats: ePub, HTML, videos with subtitles and Portuguese sign language and Portuguese sign language to produce accessible content in Word, PowerPoint, HTML and others. More information on the project is available on the website https://sigarra.up.pt/up/pt/web_base.gera_pagina?p_pagina=1011880.

- **L'empowerment personale e professionale attraverso la lingua inglese nelle persone "diversamente abili":** This project was developed as an educational path devoted to a small group of disabled people. The project's main distinguishing features were the involvement of a skilled teacher, the use of multimedia-instruments and the use of multimedia software for learning terms. More information on the project can be found on http://www.labeleuropeolingue.it/en_dbprogetti_scheda.asp?cod=19/08.

- **DEAL TOI - Deaf People in Europe Acquiring Languages Through e-Learning - Transfer Of Innovation:** The DEAL-TOI project, launched in 2012, created a digital learning environment specifically conceived for deaf learners and six different foreign language courses to promote this key competence in deaf people. More information on the project can be found at the European Commission website: http://ec.europa.eu/education/language/label/label_public/index.cfm?fuseaction=project_award&award_id=9070.

- **La Scuola dei Segni:** This project, created in 2010, aimed to promote the teaching of "Sign Language" through the use of multimedia technologies. The project was based on a local partnership between a training organization (O.P.P.I.), an organization bearer of necessities (Ente Nazionale Sordi Milano) and an organization keeper of the sign

language interpreter's expertise (ANIOS). More information on the project is available on the website: http://www.labeleuropeolingue.it/schede_progetti/Pages%20from%202010_12_progetti-7.pdf.

- **VET4VIP:** This project, Vocational English Teaching for Visually Impaired People, aims to provide adequate training and materials for language teachers on how to deal with visually impaired people and how to use and create teaching materials for these students. This is all achieved through adaptable computer-based training modules designed for blind and visually impaired adult learners. For more information on the project is available on the website: http://www.vet4vip.org/index.php?cat=The%20Project.

- **Prosign Project**: Establishment of European standards for specifying proficiency levels for use in Deaf Studies and Interpreting programmes offered at tertiary level. More information on this project can be found on the following website: http://www.ecml.at/F5/Abstract/tabid/868/language/en-GB/Default.aspx.

- **Good practice in the teaching of Chemistry to Blind and Visual-Impaired students – Portugal**

  A group of professors from Faculdade de Ciências e Tecnologia from Universidade Nova de Lisboa as developed a software that allows the study of chemistry by Blind and Visual Impaired students. The program called *NavMol 2.0*, is a software that enables the navigation of molecular structures and chemical reactions by blind and visually impaired (BVI) users and enables BVI users to interpret and edit molecular structures by making use of common accessibility tools.

  NavMol 2.0 uses voice synthesizers and time clock polar type coordinates to communicate with the blind user and, at the same time, displays a conventional chemical sketch on the screen for sighted users.

The new version of the program is based on the Chemistry Development Kit (CDK) that provides a chemoinformatics infrastructure. In order to help the navigation, automatic perception of structural features and their location were implemented, including functional groups, rings, and reaction centers. The editing features enable the building of chemical structures that can be exported and subsequently utilized in other software packages. This software is especially suited to be used by BVI researchers or in "inclusive classrooms", providing BVI students equal opportunities, greatly enhancing the communication between BVI and fellow sighted students, as well as teachers. For more information please see the following references: Fartaria et al. (2013); Pereira et al. (2013) and Pereira et al. (2010)[28].

- **Good practice in receiving disabled students – Universidade Aberta: "The "Projeto Acessibilidades" ['Accessibilities project']**

  This project was developed in Universidade Aberta since October 2008. From this date on it has developed its action in virtual environment with the purpose of helping and promoting collaboration among students with physical and sensorial limitations of access to UAb's online courses. This article comprises two parts. In the first part, the project and the profile of the students that integrate it are presented. In the second part, the action and the importance of the project are exemplified by the presentation of specific cases of problem solving that have led to the design of procedures and strategies leading to a better inclusion in the technological environment of distance education. The profile of the students and their main needs have been identified thanks to the quantitative and qualitative analysis of the answers provided to online questionnaires, and to the observation of the reflections and debates taking place in the discussion fora of the "Projeto Acessibilidades".

[28] Pereira et al (2011). MOLinsight: a web portal for the processing of molecular structures by blind students. Journal of Chemical Education, 88(3) March, 361-362.
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Three major core issues have been identified: 1) the interaction teacher / student and the inherent identification and valuation of situations that justify didactical and / or curricular adaptations, 2) the access to study materials adapted to the needs of the students, and 3) the adequacy of the physical and temporal space of in-person evaluation tests to the needs of the different students. The answers to the problems identified has led to the establishment of guidelines that seek to find the middle point between the standardization of protocols or procedures, and the primacy of flexibility and adaptability to specific cases. Strategies easy to perform and crossed by multiple pathways have been promoted to prevent the loss of information, in order to broaden educational options and the possibilities of access to education and learning of people with special needs, aiming thus at the fulfilment of the goal of an inclusive and barrier-free online teaching."[29]

- **Good Practice in receiving disabled students – GTAEDES – Portugal**

Created in 2004 the 'Working group for the support to students with disabilities in higher education' (GTAEDES: http://www.gtaedes.pt/) integrates public higher education institutions that have support services for disabled students. The objectives are to promote a quality service, to share experiences, to develop partnership initiatives and to rationalize resources. Information and training initiatives has been organized to help the support services of HEI. A special focus has been on improving the accessibility of contents and services in digital format in HEI, with a particular emphasis on the resources in the Internet and in library data bases. GTAEDES collaborated with General Directory of Higher Education for the conception and implementation of the national inquiry on support services to disabled HEI students. The GTAEDES website provides information for disabled students regarding the

[29] Reference – Dias, I. M. B. et al., (2016). Projecto acessibilidades: modelo de inclusão do ensino superior a distância [Acessibilities Project: inclusion model of higher education distance learning]. In Paulo Dias et al., *Práticas e Cenários de Inovação em Educação Online* [Practices and Scenarios of Innovation in Online Education], pp. 77-99, Lisboa: Universidade Aberta.

conditions that each HEI offers in terms of existence of a contact service or person to welcome and support the students, existence of a specific regulation for impaired students, curricula and assessment adaptations, specific support products and Individual support.

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3. Reports and Studies on Disabilities:

- **National Accessibility Report ANED 2012:** This is the output of the work developed within the European project ANED – Academic Network of European Disability Experts which aims to evaluate the effectiveness and impact of the accessibility measures adopted in Portugal. The study, that represents the state of the art of accessibility in Portugal, focuses on accessibility on transportation systems, communication and information systems and goods and services in general, basing the research on existing contributions on the subject, namely academic literature and government documents, reports, studies among others. The report is available on the website http://www.crpg.pt/estudosProjectos/temasreferencia/def_incap/Documents/Relatorio_Acessibilidade.pdf.

- **Disability Rights Promotion International – Portugal (DRPI):** This project helps monitoring the implementation of the Convention on Human Rights of People with Disabilities, a pioneer in Portugal and in Europe, to be open to the participation of civil society, and in particular the representative organizations of persons with disabilities. It aimed at establishing a sustainable system of monitoring of the human rights of people with disabilities listed worldwide. More information is available on the website http://capp.iscsp.ulisboa.pt/disability-rights-promotion-international-portugal.

- **Parallel Report on the Monitoring of the Rights of Persons with Disabilities:** The Disability and Human Rights Observatory (ODDH) in partnership with its Advisory Board prepared the 'Parallel Report on the Monitoring of the Rights of persons with Disabilities in Portugal' which was submitted in July 2015 to the Committee on the Rights of Persons with Disabilities of the United Nations. The Report is subscribed by 32

entities, representative of 241 disabled persons' organizations. It was a response to the call of the involvement of the civil society on the monitoring of the Convention on the Rights of Persons with Disabilities. The report can be read in the link http://oddh.iscsp.utl.pt/index.php/en/2013-04-24-13-36-12/publications-of-oddh-researchers/item/231-parallel-report-on-the-monitoring-of-the-rights-of-persons-with-disabilities.

- **Assessing the impact of European Government Austerity Plans on the Rights of People with Disabilities:** This report aimed to gather evidence and data on how the current economic crisis, especially the cuts made in 2012 by a number of European governments, impacted people with disabilities, which represent 80 million people in Europe. The report can be found in the following link http://www.gulbenkian.pt/images/mediaRep/institucional/FTP_files/pdfs/PGDesenvolvimentoHumano/EFC_Studies/index.html.

- **The EBU brochure 'Minimum standards for low vision services in Europe'**: EBU has just presented a new toolkit which aims to support EBU national members to provide quality services that meet the specific needs of persons with low vision to cope with the impact of their sight loss on daily life. It is intended as a resource document based on the UNCRPD and offers good practice examples and reference documents that may help member organizations in their efforts to implement the EBU standards for low vision services in Europe. It is now available in doc and pdf formats from, http://www.euroblind.org/working-areas/low-vision#news.

- **A new report 'Erasmus+ Mobility of Students with Disability':** A State-of-the-art report on the accessibility of exchange programs for students with visual impairments jointly produced with ICEVI Europe which intends to obtain a clear picture of the possibilities and barriers of exchange programs for university students with visual impairments.

Available in doc and pdf formats, www.euroblind.org/working-areas/access-to-education#news. This document was co-funded by the "Rights, Equality and Citizenship Programme" Programme of the European Union.

- **CNUDD (National University Conference of Delegates for Disability):** The guidelines of this conference can be read in the following link http://www.unifg.it/sites/default/files/allegatiparagrafo/21-10-2014/linee_guida_cnudd_2014.pdf.

- **Ministry of Education, University and Research:** Guidelines for the inclusion of students with disabilities: http://www.aosp.bo.it/per.crescere/Link%20Interni/Documentazione/Guide/Guida_MIUR_prot4274_09_all.pdf.

- **Ministry of Education, University and Research:** Statistical data on the inclusion of students with disabilities in Italy can be found on the link below: http://hubmiur.pubblica.istruzione.it/alfresco/d/d/workspace/SpacesStore/c46ef907-3aa4-47d6-bb20-2490848fe12b/alunni_con_disabilita_as_2009-2010_def.pdf.

- **INCLUSION Network LLP – Recommendations** http://www.llpinclusion.eu/default.asp

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4. Promotion of accessibility by local governments or city councils

- **Lisbon's Pedestrian Accessibility Plan:** This project from the Lisbon City Council was developed in 2013 and aims to design and monitor the adaptation of spaces, services and activities to all people including people with impairments, fostering the creation of a "city for all". More information on the project is available on the website http://www.cm-lisboa.pt/viver/mobilidade/acessibilidade-pedonal/plano-de-acessibilidade-pedonal.

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