

Developing a Culture of Accessibility in a University context*

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Abstract

This paper reports about a study carried out in France about the barriers and good practices for making digital information accessible in academic context. Digital information available for students is wide and comes from various sources : institutional website, administration, library, pedagogical frameworks, *etc.*. To face the rapid increase of students with disabilities, and especially print impaired students, it is necessary to develop a culture of accessibility in the whole university in order to make the need for accessibility becoming a reality. We will describe the roles of various contributors of these digital information sources and describe what kind of information is needed by each group of contributor.

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1 Introduction

In the last 5 years the number of students with disability in French universities has been steadily increasing by 15 % per year, reaching 20,500 students during the academic year 2014/2015¹. This is due to the effects of the Law of February 11, 2005 on equal rights, equality of opportunities, participation and citizenship of persons with disabilities, usually referred to as the Law of 2005 (*“Loi n°2005-102 du 11 février 2005 pour l'égalité des droits et des chances, la participation et la citoyenneté des personnes handicapées”*) which allowed a lot of young people with disabilities to reach successfully the *baccalauréat*. This examination is the main entry point for higher education in France. Therefore any student with or without disabilities, who passes it successfully, has the right to enter a higher education institution, such as a university. Indeed the Law of 2005 explicitly mentions that students with disabilities can register in higher education under the same conditions as any other student. In addition this Law requests that university set up all necessary efforts to provide students with disabilities with the accommodations they need, in order to ensure that they have equal chances to succeed in their studies. A few pioneer universities had already created support centres for students with disabilities, in charge of providing them with efficient and meaningful pedagogical accommodations. After this Law, most higher education institutions created such support centres in order to face the rapid increase of the number of students with disabilities, so nowadays, about all universities in the country have a support centre.

The development of these support centres have been very important and useful for students, but is not enough, since figures shows that the number of students with disabilities will continue to increase in the next years. One of the key issue to help support centres is to improve digital accessibility at all levels. Here it is very important to well understand that improvement of digital accessibility is not going to make support centres useless, but on the contrary to make their work possible in the next years.

The number of digital documents that are provided to students is also growing rapidly, but it is also changing the teaching methods [4]. [2] shows that new technologies have a positive impact on people with disabilities, which can be illustrated in a huge number of cases of course, but they can also have a negative impact when mainstream technologies are in conflict with assistive technologies. That is the topic of digital accessibility which can be described as the way to enable assistive technology to fully function.

The number of students who need accessible documents is also quickly growing. Namely they are print impaired students, including students with visual disabilities, whose numbers are practically stable, but also students with language and learning disorders (including for instance many students with dyslexia). The latter group is one of the two 2 category of disabilities which has increased in numbers the most in the last 5 years, to reach now 20 % of students with disabilities at national level.

Therefore it is important to ensure that digital documents provided to students are accessible, otherwise the need for adaptation of document by support centres will grow in a uncontrolled way. Of course this is an economic argument that should not be necessary since accessibility should be principle, but it may be useful to mention this aspect to the *“managers”* who, unfortunately, rule most universities nowadays.

We have carried out a study[3], with the support and the collaboration of the MENESR, the French Ministry in charge of Higher Education, in order to identify barriers to digital accessibility in universities, and enlighten good practices that have shown to improve it in some universities. In parallel, the same study was conducted in cultural organisations like museums, but we will focus on the academic part of the study.

¹Yearly figures about the population of students with disabilities are published by the ministry on the website <http://www.handi-u.fr>.

In this paper we will describe the outcomes of this study, which took place in the first semester of 2015. We will describe the main barriers that have been found, and the methods that have shown to be successful in some universities. From the results, we will propose good practices to improve the situation : we are currently in the process of writing a guide for universities to communicate good practices and help them to improve the situation of digital accessibility in their settings, as well as documentation for content contributors. Finally we will present some remaining barriers that need to be addressed. But first, let us consider the academic context for digital documents.

2 National Study

2.1 Context

Digital information is present nowadays in a wide variety of sources in every university. There is of course the institutional website where students can find many information before coming to the university as well as during their studies. The institutional website is also the showcase of the university, where various partners : other academic institutions and public bodies, or companies, find first information. In addition the institutional website has a lot of parts corresponding to departments, laboratories, institutes that are part of the university. These parts maybe included in the main website or completely independent ones, and their number is function of the size of the university.

The institutional website is the most visible from outside but only a small part of the digital environment of students. Many administrative tasks also need online access, from registration to access to their evaluation and results. The university library also have its own site with access to online catalogues and resources. Even the university restaurant has its website. Last but not least, more and more pedagogic information can be found on pedagogical platforms, where an increasing number of teachers put documents for students. These documents can be from various nature : from slides to online exercises, guidelines to write and deposit reports or even online exams.

In France the Law of 2005 requests that all this digital information is made accessible according to a set of rules which was directly derived from international recommendations (namely WCAG). This set of recommendation are gathered in an official document, entitled RGAA (*"Référentiel général d'Accessibilité pour les Administrations"*, which literally means "General repository of accessibility for administrations"). In reality only few of the digital information is really conforming to this set of recommendation and effectively accessible. Nevertheless several universities have a good level of digital accessibility already and our study focused on them, in order to identify reasons of success or of failure of accessibility.

2.2 Roles

Websites, in the University context as well as in the rest of the world, are usually based on CMS that are managed by a service of computer specialists (*e.g.* webmaster), which set up frameworks on which contributors publish and update digital information. These contributors are themselves from 2 main groups : people who publish information about the university, news, guidelines for administrative tasks, calendars *etc.* and authors of pedagogical contents (*e.g.* teachers). To simplify the text, we refer to these roles as **webmasters**, **contributors** and **authors**.

2.3 Study protocol

Several universities were selected, after a quick overview of a number of locations, some of them because they had pretty good reports on the level accessibility of their digital information, and some

because the accessibility was found low. As there are about 80 universities², it was not realistic to make a comprehensive study of all locations, including all sources of digital information.

The study was based on a qualitative inquiry. Four main sources of digital information were selected :

- (1) the main institutional website,
- (2) the information about support centre for students with disabilities (which may be included in the latter),
- (3) the university library website,
- (4) the main online pedagogical platform (there may be independent platforms in use by some department, or even a single professor, as they usually have been developed first in an heterogeneous way, but universities are now in the process of homogenising their platform, which has an interest on the side of the accessibility, since it is easier to ensure the accessibility of the architecture of one platform than of several disseminated at different levels in the institution).

Then the people in charge of these sources have been identified in the selected locations, including head of computing services but also staff in charge of websites, staff in charge of disability service, etc. In each location, interviews of these individuals were conducted. The study goal was to identify the problems that they had been facing, and the solutions that they had found and implemented. A total of 7 institutions, from several regions, have been participating in this inquiry, all of them completing a detailed questionnaire including sections directed to the library and to the pedagogical platform maintainers, and 21 interviews of individuals have been conducted.

We have asked the 7 universities who participated about the accessibility of their websites, and they declared that about two thirds of the web sites were accessible (considering the total of web sites from these universities). But only in one case this accessibility had been checked by an external independent entity. Note that the absence of checking by external entity does not imply a problem of accessibility, indeed the costs are high regarding the size of the websites, and self checking cannot be considered as a problem.

2.4 Main barriers found

In this section we will develop the main barriers that have been enlighten by our study, coming from the declarations of people in charge of locations where a website is not accessible, and also from the barriers that had been faced and often overcome in locations where they were declaring their websites accessible. We will start by the most important that have raised : the lack of awareness of the different actors.

2.4.1 Lack of awareness

Indeed the biggest barrier remains the lack of awareness. A lot of people, in the general population as well as in the university context, have no idea how people with visual disabilities can access a computer and therefore online services. The need for physical accessibility is now well understood by most of the population and we can see a lot of improvement in the behaviour of people, for instance in Paris. Moreover they can experiment amenities like ramps and sidewalk wheelchair access with baby-buggies and shopping trolleys, and easily imagine how difficult or impossible it would be for a wheel chair user to circulate without these facilities.

²The exact number is varying as the French authorities have decided to perform a sort of *Cultural Revolution* obliging establishments to join in several forms, in most cases in opposition to the large majority of the academic staff.

On the contrary we still can observe how it is surprising for most people to see a blind person use a computer. We are not able to show figures about that and it would be probably quite interesting to conduct a study in the public to measure this formally. We have observed many times that people usually know about speech synthesis but have no idea how it could be used to access a computer interface, and most of them ignore completely the existence of Braille displays. The global knowledge about people with other print disabilities is even lower and the possibility for them to use software that may improve their ability to read is close to zero.

This is true also in the context of technical staff in charge of setting up and maintaining websites and pedagogical platforms in the universities. As most of them have no idea how people with print disabilities access the Web and even that they may try to do it, there is few chances that they improve their professional practices in direction of accessibility. Actually the Law of 2005 states that people in charge of digital communication services from the public sector should follow vocational training about digital accessibility, but our study shows that few staff member had actually followed this kind of training. In one case, the main developer had acquired some knowledge by self-education for personal reasons. Another issue is the lack of feedback from people with print disabilities, whether their sites are accessible or not.

Finally this aspect of Law of 2005 is widely ignored by the actors. While the question of physical accessibility have generated a lot of comments in the press, the question of digital accessibility have barely been mentioned.

2.4.2 Wrong ideas

Another big issue is the persistence of wrong ideas about web accessibility. The items that have raised from the study interviews are

- (1) It is **very technical**, the guidelines are difficult to follow.
- (2) It is **very expensive**.
- (3) It concerns a **very low number of users** regarding the investment.

These three items are linked, the supposed difficulty of the task would require to hire a specific engineer or to externalise and use the services of an external company. This would represent a too big investment for a low number of people. On the contrary the benefits of having an accessible website are mainly ignored.

Interestingly the number one comment usually mentioned in studies about accessibility, stating that accessible web sites are boring, an even ugly, was never mentioned in this study. This may come from 2 possible causes : (1) university websites are usually sober and very functional, and (2) people have not even ideas about that aspect.

2.4.3 Lack of political will

On interesting fact to consider is that, if the Law was passed in February 2005, the implementing decree was only published, with the first version of the RGAA (see above) in May 2009, that is more than four years later. Furthermore the Law does not really provide for any enforcement mechanisms in this regard. A black list had been planned, but it's creation and maintenance would have been very difficult, and additionally the relevance of such a black list can be questioned. Most organisation would not care to be blacklisted there.

The lack of awareness, mentioned above, touches also the people in charge of university governances, and therefore the development of a real political will in this domain, at the level of the university, remains difficult (especially when the government itself shows no political will at all).

If they can see some limited interest in terms of image of the institution, the big advantages in terms of inclusion of all students, which is part of their societal mission, in terms of referencing of their content by search engines and also in economics terms are globally ignored.

2.5 Reasons of success

The following concerns locations where the people in charge had qualified as accessible their websites.

First they were asked why they had decided to make accessible their websites. These are the 3 main answers which came out are : (1) because of the Law (in a third of cases), (2) it is part of the policy of the university about disabilities (almost half cases) and (3) because some individuals had a sensibility to the subject (for instance one webmaster had been to a vocational training, or one of the staff members had a particular interest for personal reasons). Another interesting response, which came out once, is that an external service provider had advised them to do so.

Some of the websites were designed by external service providers (a quarter of the institutional websites for instance) and the others developed by local staff from the university. In the case of external services, the need for accessibility was mentioned in the requirements specification. In the other cases some staff had received a vocational training.

In most cases, a lot of contributors from the university staff put information on the websites, even if an external services provider is involved. In two thirds of cases the contributors have received some information about accessibility which was part of training (contributors have often to follow a specific training when they are agreed to put information on a website), or documentation.

Finally in all cases the cost of making digital content accessible was never mentioned as a problem. It was considered as null in several cases. The vocational training is supported by specific funds in France and actually there are no direct costs for the university to make their technical staff follow some training.

3 Developing a culture of accessibility

As mentioned in the introduction, at we write these line, we are in the process of writing a practical guide for universities to communicate good practices and help them to improve the situation of digital accessibility in their settings. This guide will focus on the development of what we would call a *culture of accessibility*.

Our study strengthen the idea that a lot of communication has to be done in order to reject the wrong ideas that are still present about web accessibility, and – even more important – make understand that the accessibility is a principle that have to be endorsed by the whole university community, which we have called the development of a culture of accessibility.

Indeed the bad idea would be to hire a specialist of accessibility who would be responsible for accessibility in the whole environment. Indeed as said earlier the sources of digital information are multiple in a university, and the volume of this digital information is huge, and growing. Furthermore the webmasters are only in charge of the architecture of the websites, but the contents are designed by a lot of contributors and authors (see definition of the roles above).

One key issue is to clearly define the roles of each of the actors towards accessibility. Indeed the contributors and authors do not have to acquire technical knowledge, but only to respect a set of simple guidelines. Then everybody can contribute in respect to her/his role to create the culture of accessibility in the institution.

3.1 Responsibilities and training

Each member of these three groups (webmasters, contributors, authors) have a part of responsibility in the development of the whole digital environment of the university, and therefore in making it accessible.

The first group, the **webmasters**, have to make accessible the structure of the platform they set up, being a simple CMS for the institutional website or a pedagogical platform, and to maintain it accessible over time. They need to have technical knowledge about accessibility and therefore to attend vocational training in order to develop it. It is not enough that one of the staff member receives such training, this technical skill need to be shared by all the members, even if one can have more competency on the subject and serve as resource for her/his colleagues. Nevertheless all the members of the team must be aware of the necessity of accessibility and have basic technical information.

In particular, additionally to technical knowledge of the WCAG, it is important that they are able to select platforms according to its embedded potential of accessibility, and to find and install some accessibility additional features (like accessibility plugins, *etc.*).

If the institution uses the services of an external service provider, it will be necessary to state the need of accessibility, in regard to the Law and to mention the respect of the RGAA guidelines in the requirements specification transmitted to this external service. In this case the people in charge of negotiate contracts must have a clear information about that.

For the group of **contributors**, fortunately they do not need to have technical knowledge. It is important for them to be aware of that simple thing, but they must be informed about the need for accessibility, as well from the student side than from the legal issue. If the university provides some training for staff in charge of contributing to the websites, this training should include a part about digital accessibility. In addition, it is important that they get some proper guidelines about structure of contents within the editing software they use (word processor or online editor of posts) and basic information about alternative contents.

It is quite similar for the group of **authors**, but there are 2 main differences : first this group is less attending to this kind of training so very good practical documentation must be provided, and then the nature of documents produced is different. Indeed pedagogical documents may be more important, in volume, so structure is even more important, and the nature of illustrations are usually different. Indeed in the case of websites, most illustrations does not convey much information. A lot of them are pure decoration while a fair part are functional (like an icon for “homepage”). Alternative content is very simple in these case. In the case of pedagogical contents a lot of illustrations may convey important and bulky information. It can be for instance graphics showing evolution of various data, maps, or pictures, audio, videos *etc.* In that case a long description is needed, or a caption.

3.2 Documentation for contributors

While writing these lines, we are also in the process of writing some guidelines for contributors, which are complementary to the practical guide. These guidelines include information about structure, basic alternatives and a few additional points (like identification of language, meta-information, level of language, *etc.*) that are easy to understand and not time consuming. These guidelines are coming together with practical sheet about how to do it with several software applications : how to implement contributor’s accessibility guidelines with LibreOffice, with Ms Word, with WordPress, and a few others.

3.3 Long descriptions

Although the simple guidelines mentioned in the previous paragraph (about structure and basic alternatives) are not difficult and won't take much time, the development of long descriptions is technical and time consuming. This should probably not be asked to the authors directly. Indeed the results would be poor, because as well lack of competency as lack of time. We believe a specialist of adaptation and transcription should be available for these tasks. This professional should work in close collaboration with the author since the way it will be described should be in line with the pedagogical intention of the teacher. Some pictures can also be described differently when they are used to illustrate different topics.

3.4 Scientific content

The graphics, curves, diagrams and outlines would fall in the situation previously described. Additionally scientific content often include mathematical expressions. Some specific guidelines are necessary for these expressions. A specific practical sheet about mathematical expressions will be made available, based on items mentioned in our previous works [1]

- A mathematical expression = ONE mathematical object :
 - Never use an image file,
 - Never put multiple expressions in a single object,
 - Never split an expression into several objects;
 - Variables must always be identified as mathematical objects (even in accompanying text)
- A mathematical object should not be used to simulate italics

3.5 Beneficial impact

The beneficial impact of making accessible the websites have to be stressed in the practical guide, in order to supply university management with convincing arguments. These arguments include the following items :

- Better image of the university,
- Improve equality of chances for all students,
- Respect of the legislation about compensation of handicap,
- Better referencing of their content by search engines and online databases,
- Low cost,
- Make easier maintenance of websites, and therefore decrease maintenance costs.

4 Remaining barriers

Despite these practical guides, that will be disseminated by the ministry in the higher education institutions, a couple of remaining barriers are still there.

4.1 Lack of information in computer courses

First, one of the problem we face come from the lack of information about digital accessibility provided to students in standard computer courses as well as in web oriented ones. Basic information about accessibility of content should also be included in courses about information and communication and all related specialisations. This should be addressed at the national level, by appropriate politics, as well as locally in each university.

4.2 PDF documents produced from \LaTeX sources

Another big problem currently comes, surprisingly, from the massive use of \LaTeX in scientific topics. It is not \LaTeX in itself which causes problems actually. Indeed \LaTeX offers the possibility to tag structure and to respect a lot of accessibility guidelines. But the PDF documents created from \LaTeX sources do not respect accessibility guidelines, the accessibility checker reports the lack of structure. [5, 6] presented interesting works about generating “tagged PDF” from \LaTeX sources, but it is not implemented in main distributions. An accessibility package³ has been developed [7] but documentation is only available in German language, which makes it difficult to use widely. However several issues remain :

- integrated mathematical expressions,
- alternative content to illustrations (included with the `graphicx` package),
- tables,
- ligatures.

Most students with visual impairment who study sciences will access directly the \LaTeX source and therefore won't have much problems to understand the content, even if the mathematical expressions are long and cumbersome.

The problem remains in the way the \LaTeX sources are compiled into PDF documents. Indeed the growing group of students who need accessible documents include students with visual disabilities as well as students with language and learning disorders like dyslexia, for who access to \LaTeX sources would be extremely difficult. Furthermore if science students, used to manipulate mathematical expressions, may be able to learn the \LaTeX code, all students who are studying other topic where mathematical expressions are used, like economics or linguistics will find this difficult.

5 Perspectives

As seen above, a lot of work remains to be done on the generation of PDF documents from \LaTeX sources in order to improve their accessibility. We still need to find some way to fund these works.

Finally we believe that the documents and the communication around this topic will contribute to develop the culture of accessibility within the university context, that could improve the accessibility of academic digital information.

The comparison with the part of the study related to the cultural organisations, which was not described in this paper, shows that nevertheless the situation is a bit better in the academic context. The inclusion of more and more students with disabilities made a growing number of teachers aware of the problem and therefore they might be able to use the documentation about accessibility that we are preparing. More communication must be done towards heads of universities and technical services. However the French universities have to better define their politics toward people with

³http://www.babs.gmxhome.de/download/da_pdftex/accessibility.sty

disabilities, thanks to a Law passed in 2013 and we hope that this will be an opportunity to include some string political will about digital accessibility.

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