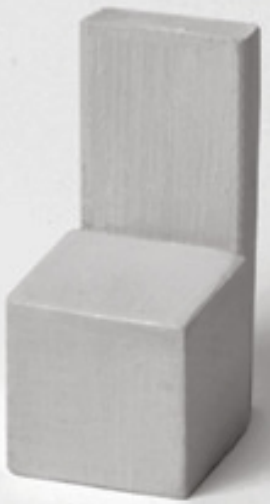
Formación Curricular de Diseño para Todos en Diseño



Education on Design for All in Design Curriculum

INSTITUTO DE MAYORES Y SERVICIOS SOCIALES (IMSERSO)

The Instituto de Mayores y Servicios Sociales proposes, manages and monitors national social services plans and has several centres with specific functions in the fields of disability and elderly people.

FUNDACIÓN ONCE

The Fundación ONCE is the expression of the commitment and solidarity of visually impaired Spanish people with other groups of people with disabilities.
The Fundación ONCE works for equality of opportunities and the improvement of the quality of life of people with disabilities, through plans for Universal Accessibility, Design for All and by encouraging the training and occupational placement of this group.

COORDINADORA DEL DISEÑO PARA TODAS LAS PERSONAS EN ESPAÑA

(EIDD - Design for All Europe in Spain)

Founded in 1996, our Association aims to bring together all bodies, administrations, corporations and professional firms with an interest in Design for All, understood as a conception of environments, products and services so that everyone, including future generations, irrespective of gender, age, abilities or cultural background, can enjoy all the elements of their environment and take part in social development.

Education on Design for All in Design Curriculum

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0. PROLOGUE

Coordinadora del Diseño para Todas las Personas en España

Francesc Aragall, President of the Coordinadora
Jesús Hernández, Vice-President of the Coordinadora

After publishing the "White Book of Design for All in Universities" in 2006, as a result of the cooperation between the *Coordinadora del Diseño para Todas las Personas en España,* the *Instituto de Mayores y Servicios Sociales (IMSERSO)*, the *Fundación ONCE para la Cooperación e Inclusión Social de Personas con Discapacidad* and different bodies at Spanish universities, and in accordance with the very positive acceptance of both the concept of *Design for All* and the various contributions made throughout the first project, the Coordinator understood that it was the right time to take the next step and increase awareness about the experiences acquired, as well as spreading their actual implementation in universities.

Therefore, this new project was proposed in order to take advantage of a moment at which universities, as a reflection of society itself, are undergoing a process of change due to the Bologna accords, which advocate the harmonization of the curricular plans for university degree programs in the member states of the European Union. All of the universities that cooperated on the preceding project expressed their agreement that it was very advisable to bring together the contributions for the inclusion, as is required, of *Design for All* in the curricula.

Yet again, this project was made possible thanks to the economic support of the IMSERSO and the Fundación ONCE.

Therefore, this set of publications contains five open proposals for curricula in the same number of university education subject areas. In order to achieve a more immediate benefit for society, the decision was reached to work on the technical degree programs most directly related with the constructed environment and information technologies, and therefore those indicated below are the fields which were selected:

- Architecture
- Design
- Information Systems and Telecommunications
- Road, Channel and Port Engineering
- Industrial Engineering

In order to produce the documents which were later published, five seminars were held, one for each degree program, at which different teams from the different Spanish universities involved were brought together. They reached agreements regarding the contents to be used in drafting a final proposal, which was approved by the project's Scientific Committee.

We hope that this collection constitutes an effective form of support for those university faculties which are already including *Design for All* within their educational programs, as well as a stimulus for those which have yet to deal with the inevitable challenge of doing so in order to contribute to providing the future professionals who will be building the future of our society with the most well-rounded education possible.

1.
INTRODUCTION

1. INTRODUCTION

Design for All, an approach: design thinking for social integration

Avril Accolla
Vice-president of EIDD-Design for All Europe

All the actors involved in education are essential in the process of having satisfied, independent individuals enjoying a Society for All, Design for All gives new perspectives and possibilities to this field of expertise and action. Getting rid of certain specific barriers can be relatively easy when we have both the will and the means. Building a world that values human diversity and caters for the needs and desires of a complex, globalized society is a challenge: Design for All faces this challenge with a holistic approach and a process based on design thinking.

In striving for a Society for All, we need to achieve synergy in professional consulting and awareness in all aspects and levels of the process. That's one of the reasons why the release of these five white books relating to five different areas of professional culture is so exciting (design, architecture, industrial engineering, ICT, civil engineering).

While developing this project, it has been a pleasure witnessing the great level of awareness and development of Design for All among the Spanish colleagues, authors for these white books.

The research and the planning inputs are both a practical guide to work with and an

inspiration. The broad and renaissance approach gives an insight on how deep and powerful such a proposal can be. Both the methodology and the content produced represent a needed breakthrough in the university curricula.

There are many important challenges in these documents and set by these documents. One of the most subtle, but equally relevant, is the proposal to have Design for All and human diversity transversally permeating all the subjects in which the relation with the individual makes a difference, so flanking a further specific course on Design for All. Focusing on human diversity in various areas and levels will also start a capillary research which will give, both professors and students, those tools most needed for the further Design for All specific course. This will lead to a cultural revolution: not acceptance anymore, but true valuing of the richness of human diversities and integration.

Future professionals will build and rule the society. Leading them through what is human diversity and how much it influences the result of our planning and actions will make that paradigm shift which will shape an inclusive and more effective development because it starts from the understanding of the needs and aspirations of *real* people.

When welcoming Design for All approach, which will be the effects in education? This is an issue that is not so common to find debated. In the proposals and experiences presented we can find a Design for All approach to the pure content (what subjects to teach), the form of the content (how enabling is the content, from a cognitive and sensorial point of view), the way the content is dealt with (ways of teaching, working and experiencing which value human diversity), finally how enabling the structure and the organization of the university is. These themes, not strictly connected to a specific faculty and profession, can be fruitfully

developed in a research program on Education for All.

Stakeholders and decision makers are as essential as planners and developers in the Design for All process of achieving a Society for All. It is a key factor to introduce the relevance of human diversity and Design for All to the law and business worlds.

Managers will be aware of just how much more successful the business gets through Design for All and start asking for it, with a clear benefit for society.

Legislators will have better tools to set guidelines (not technical data) which are open to the diverse needs, but strict with the necessity to strive for integration.

Therefore, I hope that the initial proposal to develop a white book on the Design for All Curricula with both the law and the business faculties will happen in the near future within the next step of this outstanding project.

In these books there is no mention to accept, tolerate or even respect human diversities: maybe that's the greatest message, the step forward, Design for All cutting edge of innovation. Human diversities are a reality as such and working holistcly with them will lead to a more efficient, effective, beautiful and exciting project. Desires and aspirations are in the same league with needs and necessities: being able to enter it is simply not good enough; the person interested in entering must want to enter and enjoy the experience.

Design for All does one of the most difficult jobs, it values human diversities. That's why Design for All is a winner: gets *real* people satisfied.

A comic may set the pace

Are we Superman's clones, one size and one mind?

Superman dresses himself up as Clark Kent to mingle among us, real Clark Kents, who disguise ourselves as Superman to conform to the designed artificial environment.

We adapt to standards, expecting nothing more than standardized answers to standardized needs set by a *Deus ex Machina*, quite absentminded and with little clue of our real needs.

Standards have a sensible purpose when achieving matches between parts of machines, based on their similarities. Humans are not machines: standards simply don't fit and don't work.

Design for All has a broader picture: using design thinking for social integration.
Design for All answers by respecting human diversities and using them as one of the richest tools to achieve social integration in the most effective, creative and satisfying way.

Our discomfort in managing daily life (handicap) is generated by social and design factors: it is not generated by our disabilities, competences, knowledge etc. The things and environments we use were not devised for us, but for somebody else: somebody with a benchmark imagery technically dedicated to the specific situation of use, somebody who speaks a different language, somebody with a different system of cultural de-coding, somebody with different intentions and necessities of use, somebody who is younger or older, stronger, and so on.

Why does this happen?

In today's design practice, human diversity is not perceived as a complex reality to cater for. When it is considered, human diversity is limited to mere anthropometric evaluations: how much does the size of the palm of your hand matter (which, by the way, it is not easy to find in manuals) in the use of a remote control which implies de-coding, comprehension and managing the interface in different use situations?

Ergonomics has long been proposing the systemized and structured involvement of the end user in the phases of concept, design and control. This is a fundamental and valid principle: but do the hypothetical users examined and involved represent us? For example, does the methodological system applied to evaluate the use of packaging for medicines anticipate greasy hands, the presence of smoke, a headache and residual panic?

Design for All, glimpses

- **Design for All**

In 2004 EIDD Design for All Europe in its Stockholm Declaration© defines Design for All as "design for human diversity, social inclusion and equality".

The nature of the Design for All culture and philosophy is a working in progress one: intrinsically updating and self-poietic.

Design for All is an approach, a paradigmatic evolution of the way of thinking, looking at and acting.

Design for All is a design concept: it manages social complexity with a seamless holistic approach. It is a radical innovation which obtains a better life quality for All.

Design for All is a methodology and is implemented in a process.

Design for All finds in holistic ergonomics[1] one of the most structured and adequate complex tools in exploring and understanding human diversity.

1. Bandini Buti L. (2008), "Ergonomia Olistica", FrancoAngeli, Milano

Ultimately, Design for All is design at its best, performing excellence in the functional, communication and aesthetic aspects, no matter if it's a building, a political campaign, education, a theme park, a city or society in itself.

- **Use and experience**

Using something it is not like experiencing something. Seldom, maybe never, we use things or situations or environments: we do experience them.

Use is a laboratory like simplification of what actually happens: use it is more an analysis parameter to simplify a research then anything else. Use refers to a mono-target utilitarian aim of discharging a need or carry out a specific function.
Evidently enough we are not users. We do not behave like users. We do not act like users. Facing a situation, emotions are involved. Senses are involved. Desires, aspirations and expectations are involved. Culture and habits are involved. We are *experiencers*, not users. There's also a strong element of unpredictability to be managed.

Planning and designing for human diversity in a context of experiences opens up a great variety of possibilities, challenges and richness.

Designers do not design bad or good things, they design experiences, which can end up

successfully or disastrous. Mono-target utilitarian functions are simply not enough to provide comfort, satisfaction and well-being. The Design for All approach answers to the needs, abilities, desires and aspirations: Design for All is about creating the best experience for all.

- **Beauty**

If it is not beautiful, it is not Design for All. Bold to say, but quite true.

Design for All recognizes and exalts the role of aesthetic quality in the processes of comprehension and use/experience. Aesthetic excitement it is a specific users' need as the others, in many cases one of the most relevant. Design for All must answer it as it answers to the other needs. As D.A.Norman says, there's also a strong emotional factor in the way objects are used, the emotional side of design can be more influential then the practical ones.

Human nature it is naturally drawn to beauty, and beauty is, among trends, fashions and mores, actually a recognizable factor.

Cognitive psychology shows us that beauty not only is a pleasure, but can also enhance both the comprehension and the comfort of use. Positive emotions amplify our creative thinking and reacting.[2] A beautiful environment has an effect on the social relations and tends to be more respected.

Synaesthetic beauty performs a maximum level of efficiency and effectiveness in comparison with a mono-sensorial quality experience. Synaesthesia does facilitate cognitive processes, and gives a more intense and richer experience.[3] A planner or a designer, who works effectively on a multisensorial synergy, not only provides a better experience for all, but gives

2. On relations between emotions and cognitive processes, Joseph E. Le Doux "The Emotional Brain: The Mysterious Underpinnings of Emotional Life" ed. Simon & Schuster.

3. R. Lurija, The Mind of a Mnemonist, 1968

various possibilities to the different residual sensorial abilities.

Synaesthetic beauty it is intrinsically a tool for a Design for All approach.

- **All**

Design for All is for All. Who are those All? How do we implement a utopia?

The All of Design for All are all the individuals who desire to experience the designed item (a product, an environment, a service, etc.) which the decision makers want to implement: this is the Design for All target.

Desire is the key issue, and it is the real correct and only element of discrimination. Desire is one of the elemenst which brings Design for All as a winning approach in a mature market, as the one many of us are living in. Design for All marketing, a discipline recently founded, deals with the typical issues of market segmentation in relation with the inclusive Design for All approach and human diversity investigating tools. Among the innovative marketings, it is quite effective also to explore the relations between Design for All marketing and Co-creation marketing, Aesthetics marketing, 3 Values marketing and Lateral marketing.[4]

During the Design for All process the user varies many times, according to the part of the value chain we are concentrating on, the item we are designing, the level of abstraction we are in that specific moment (idea series 0), etc. The All are differently defined in the meta-design phase and in the design one.

4. D.Gilardelli, in A. Accolla (2008), "Design for All. Il progetto per l'individuo reale" FrancoAngeli editore, Milano.

In a strictly design phase, are defined autonomous experience, autonomous users and limit users.[5] These are design tools that help the implementer of the design brief to create the most enabling experience possible. This also becomes feasible when the critical issues of a project are designed to meet the challenge of human diversity and not to solve the problems of barriers.

5. A.Accolla (2008), "Design for All. Il progetto per l'individuo reale" FrancoAngeli editore, Milano

- **Involving**

The Design for All approach involves from the very first beginning, before the design brief is even mentioned, designers, users, decision makers/entrepreneurs and human sciences professionals. The decision making process counts and features a constant consulting and feedback with these actors till the very end of the process, using different tools according to the phases.

Doing so, the Design for All process gets the best possible result from the actors and competences available.

Getting public and private decision makers onboard is essential for Design for All: they are the ones who decide to start a Design for All process from the very beginning. They also contribute through the process with a specific and relevant experience.

Getting the designers onboard from the initial steps provides the process with the self-poietic design thinking, which makes a strategic difference.

Asking the contribution to all the diverse users and consumers of the value chain will ensure a result that answers their needs and aspiration. It will also help the designers to go beyond subjectivity.

The consulting of the human science concerning the project area, will give the planners and the designers the necessary tools to know better about human diversity and implement the Design for All process valuing human specifities.

Under these circumstances, failure is particularly difficult to achieve.

- **Accessibility**

Accessibility it is a *condicio sine qua non* for Design for All. If it is accessible though, not necessarily it has a Design for All approach. Accessibility it is necessary, but not sufficient. If something is accessible I can use it, but the real question is: am I really in a position to experience it thoroughly? Do I want to use it?

An environment, a service, a product is a relevant result of a Design for All approach when the person experiences it with satisfaction in all its possibilities, one's abilities, necessities and aspirations are respected, and one's specificities are valued.

In an old-fashioned comic, a wise character use to say "Not all the diverse are the same".

It is defined "functionally accessible social discrimination"[6] the identification of all those systems which provide *ad hoc* solutions, designed to cater only for the specific needs of a defined user group, solutions which are placed with no synergy in a system designed for an non-existent standard user. This strategy creates discriminatory situations for the user group to be included, and quite often also for others. A kind of designed discrimination that happens when design process for inclusion is based on a mere juxtaposition of various exclusive approaches. It happens when we try to group individuals under the umbrella of a

6. A. Accolla in "The processes to implement Design for All, setting the frame" EIDD International Conference "Work for All", Waterford 2006.

'common function', a 'common ability', and so on. A typical example is the blind implementation in public spaces of accessibility norms, placing specific areas for disables (the norm actually refers to wheelchair users when writes 'disable') separated from the rest of the people, meaning also friends and family. The person who uses a wheelchair, her/his family and friends, are actually socially discriminated because they can't enjoy the movie together, or the tennis match, or whatever activity they have chosen.

- **Norms and laws**

Norms have a fundamental function: they create an unquestionable obligation and they force decision makers to comply with some basic necessities of the user. When planners and designers conform to norms uncritically and correcting their finished work, there's a high risk of damage, of functionally accessible social discrimination, or even a long stop in the drive of cultural and social creative development. There's a high risk to level solutions to the lowest performance.

The implementation of Design for All in the social, political and business development areas promotes the definition of norms and laws through a holistic and inclusive methodology. Norms can be defined with the participation and co-designing from the very beginning with representatives of various disciplines, the stakeholders and the different users of the whole value chain. This avoids what have happened more then once, when an unaware legislator or a very proactive specific group designed a law which strictly enables only a specific group, actually disabling the others.

Often norms are perceived by designers and planners as a plaster against creativity. The wrongly designed ones can really become a nightmare. Generally speaking though, it can be a

design methodology issue. Design for All considers norms as a requirement among the various others that a project usually has, (such as production issues, budget, shelf-life, etc.) and works with them from the very first steps of analysis and ideation. As a result it creates an effective synergy between the elements and avoids disabling situations both on the material and social level.

- **Common aspects**

As a designer and a design director I work close with marketing and ergonomics, doing so I've found quite interesting aspects which hold quite some relevance in a Design for All approach.

Design for All, marketing and holistic ergonomics express the new humanism. The three disciplines have three different backgrounds, three different approaches with the same challenge and the same target: the human being in the center, with man and for man in his individuality and specificity.

Historical evolution is similar in the three disciplines: the more mature they are, the more they tend to reach man and satisfy his more subjective, peculiar and specific needs. Each one of these discipline with its own tools: ergonomics broads percentiles, marketing focuses on individual perceived values, Design for All theorizes valuing the difference through the *modus progettandi*.

They are three mirrors of the same society which evolves in the same direction.

- **Teaching and sharing, a personal experience**

In the last decade I've experienced teaching Design for All and related subjects, such as holistic ergonomics, design direction, system design, to various type of students in different realities: public and private universities, companies, boards, events, etc.

With such a humanistic and complex subject such as Design for All approach, which needs first of all awareness, cultural and philosophical understanding, I've experienced that the Socrate's maieutic approach is quite effective and rarely fails. It is both time and energy consuming, so means need to be carefully planned.

At all levels, from first year students to mature middle-high managers, without application and implementation of some sort, the concepts are lost and sometimes misunderstood according to personal expectations. Also the capability of being proactive in the field fades away. It remains though a good level of curiosity and an inspired awareness of a new challenge and an immense opportunity: this will lead some to go deeper.

Tactic tools vary quite a lot according to the area of expertise of the audience. On a strategic level, cultural anthropology and cognitive psychology are opening the minds to a dawn on human diversity which then keeps them alert on the other steps, such as deepenings, examples, tools, etc. The highest challenge in teaching Design for All is making people concretely aware of the deepness and capillary relevance of human diversity and its freedom and unpredictability. This is a scary step, because once acknowledged, it changes irreparably the students' vision on their work, activity and approach.

The second huge challenge is, once they have understood the nature and the vastness of human difference, to convince them that it is not utopic to work with it and cater for it.

Teaching to future or actual designers I witness daily how design way of thinking, looking at and acting, quite naturally goes for a synaesthetic, multisensorial Design for All experience. The design tools, both on a strategic and tactic level, are so efficient in a Design for All approach that they seem to be made just for it (and maybe it is so, if we analyse the bottom line of a Design for All approach).

Teaching to future or actual managers, within the design field or not, I experience the cliché the design world is suffering and how a Design for All approach can atomized it. The surprise of human diversity brings in an astonishing paradigm shift which has the great value not to be disputable. The striking strategic power of the sheer design tools such as "questioning the *status quo*" gives the managers, combined with the immense opportunities of human diversity, a good glimpse on the concrete feasibility of relevant economic growth through social integration.

2.

EDUCATION ON DESIGN FOR ALL IN DESIGN CURRICULUM

2. EDUCATION ON DESIGN FOR ALL IN DESIGN CURRICULUM

2.1. Design for All, the development of a concept

As established in the introduction to the EIDD Stockholm Declaration©,[7] approved on May 9, 2004, *Design for All* is a concept whose origin lies in both the Scandinavian functionalism of the 1950's and the ergonomic design of the 1960's. It also has a socio-political predecessor in Scandinavia's welfare policies, through which Sweden forged the concept of a "Society for All" in the late sixties, which referred mainly to accessibility. This ideological focus was streamline

7. http://www.Designforalleurope.org/Design-for-All/EIDD-Documents/Stockholm-Declaration/

Today, *Design for All* is being increasingly recognized as a necessary element in pro-active strategies for sustainable development.

Across Europe, human diversity in age, culture and ability is greater than ever. We now survive illness and injury and live with disability as never before. Although today's world is a complex place, it is one of our own making, one in which we therefore have the possibility – and the responsibility – to base our designs on the principle of inclusion.

Design for All is design for human diversity, social inclusion and equality. This holistic and innovative approach constitutes a creative and ethical challenge for all planners, designers, entrepreneurs, administrators and political leaders.

Design for All aims to enable all people to have equal opportunities to participate in every aspect of society. To achieve this, the built environment, everyday objects, services, culture and information –in short, everything that is designed and made by people to be used by people– must be accessible, convenient for everyone in society to use and responsive to evolving human diversity.

The practice of *Design for All* makes conscious use of the analysis of human needs and aspirations and requires the involvement of end users at every stage in the design process.[8]

8. EIDD Declaration approved on May 9, 2004, at the Annual Meeting of the European Institute for Design and Disability, in Stockholm.

2.2. Inclusions in the field of education. Educational projects

The development of *Design for All* has also been reflected in the form of multiple educational projects since the sixties. In her book "Universal Design Handbook",[9] Elaine Ostroff performs a review of the developments in teaching *Design for All* within the world of universities. She points out how, during a short time in the sixties and early seventies, it was very in vogue to take into account users' needs at design schools and in professional practice in the Untied States. This fashion was highly linked to American society's fight for civil rights during that decade.[10]

9. "Universal design handbook", Wolfang F. E. Preiser, Elaine Ostroff, McGraw-Hill Professional, 2001.

10. Ostroff points out that many of the professors who currently teach Design for All took part in those protests while they were design students.

Ostroff underlines that one of the greatest difficulties in teaching about this topic lies in the fact that the subject matter is divided into specific topics and that work is performed separately with specific user groups (senior citizens, the disabled, children).

One of the educational projects which formed the foundations of what the future of *Design for All* teaching would be like was developed in 1977 by Raymond Liefchez, a professor at the University of California at Berkeley. The project, titled "Architectural Design with the physically disabled user in mind," put into practice teaching methods which closed the gap between people with and without disabilities. Methods were based mainly on getting users involved in the design process as a way to teach students the advantages of creating a design for someone different from themselves. Liefchez proposed that this was the proper way for students to raise their consciousness of all users (senior citizens, people with disabilities, children). The idea is to deal not just with accessibility, but also with the relationships amongst all users. He also pointed out that people with disabilities are "environment super-

professionals," who interact with the complexity of the physical environment on a daily basis, and who possess a great deal of knowledge which they can pass on to students.

After a thorough review of teaching projects in both the United States and the rest of the world, the author concluded that bringing students in contact with users in classrooms or workshops is the best strategy possible in teaching *Design for All*.

Ostroff's book is a basic reference for educators, because it analyzes seminal projects. Since it was published in 2001, many projects have been developed, noteworthy legislative advancements achieved at both the national and supra-national levels, and *Design for All* has gone from being regarded as a marginal topic to being seen as an opportunity.

One of the most interesting proposals is offered by Graham Pullin in his recent book "Design Meets Disability".[11] Pullin, an interaction designer, proposes that design and disability can mutually inspire each other, and he advocates a social *Design for All* model instead of one that is medically focused. Throughout his book, he analyzes numerous examples of Design in which he shows how disabled individuals want to express their identity through their disability, as well (he provides the example of eyeglasses). He advocates for objects which are beautiful, as well as functional. "Design processes must be inclusive in many ways, involving not only people with disabilities themselves, but also a wider variety of designers," in such as way that *Design for All* recovers its entertaining and creative aspect, which designers tend to forget about when they place the functional aspect at the forefront.

11. Pullin, Grahan, "Design Meets Disability", Mit Press, 2009.

2.3. The Teaching of Design in Spain undergoing a process of change

Before tackling the main topic of this publication, it would be advisable to provide a brief explanation of the current status of Design education in Spain, at a time of profound changes due mainly to the creation of the European Higher Education Area.

Up to the year of 2007, when the new law regulating Spanish university studies went into effect, in order to make the agreements signed in Bologna a part of the Law, the teaching of Design was dispersed amongst various levels within the education system and between different degree programs. There was no specific Design education in the university arena.

The legislative changes, both at the university level and through the Constitutional Law on Universities, as well as at other levels of education through the Constitutional Law on Education, or *LOE*, finally made it possible to organize the teaching of Design in a rational way, while beginning to provide an education equivalent in duration and quality to that which is given in the rest of Europe.

As for the Constitutional Law on Universities, Law 4/2007 mentioned above, it establishes that "Independence is the main characteristic which universities must possess in order to provide a fast and flexible response to the changing needs of society."

This independence is what has allowed Design studies to take hold at the highest level within the educational system, the university, with full autonomy, in the manner which is proposed by each university, even though the degree earned is the same, the Bachelor's Degree in

Design, and each university has its own study plan, which is both different and specific. Pursuant to this Law, university degree programs in Design are taught at different universities in Spain with different characteristics.

As regards the LOE, it regulates university-level art education, which includes Design, in accordance with Royal Decree 1614/2009. The curriculum for these programs has yet to be developed, but the Law determines the foundations of what these study programs taught at centers of learning must include. Even though these centers are not universities, they award a degree which is equivalent to that earned in university programs.

We are therefore currently in an environment with a wide variety of forms of Design education in terms of orientation, subject matter, specializations, etc. Unlike other degree programs such as Architecture, for which there is strong regulation at both the European and national levels, the university degrees in Design which will be taught in Spain in the upcoming years will be very different from each other. And because this publication has been created with the fundamental objective of serving as a guide for universities and other centers of learning which award a Bachelor's Degree in Design, with the goal of including *Design for All* in their curricula, the structure of this publication cannot be focused on specific subjects, but rather must make statements in broader, more general terms which will be of greater use if we bear in mind the wide range of degrees and orientations.

2.3.1. Design for All in the new legislation, a transversal subject

The new laws, in addition to regulating specific studies, make clear references to the subject examined herein. For instance, the Constitutional Law on Universities, or *LOU,* establishes the following: "In the end, one must bear in mind that providing an education on any professional

activity must contribute to the knowledge and development of Human Rights, democratic principles, the principles of equality between men and women, solidarity, environmental protection, universal accessibility, design for all and the promotion of a culture of peace."

Royal Decree 1393/2007 of October 29, 2007 also establishes that the new university Bachelor's Degrees which are coming into existence will be reviewed six years after being put in place, and therefore everything aims to the fact that these degrees, with their corresponding revisions and improvements, will be lasting for at least 12 years. This means that we are currently training professionals and researchers who will continue to be active in the year 2050.

Beyond the inherent interest in creating a European Higher Education Area, this information supports the appropriateness of and need for this publication. The idea is to educate individuals for a society undergoing constant change who can demonstrate specific skills which allow them to learn throughout their lives and adapt to changes in society or lead them. Therefore, the students must possess the proper tools for knowing about that society and proposing the right solutions for all people.

"The idea is to offer a high-quality education which deals with the tests and challenges of knowledge, while providing a response to society's needs": Constitutional Law 4/2007 of April 12, 2007 whereby Constitutional Law 6/2001 of December 21, 2001 on Universities was amended.

As regards the LOE, Point b of Article 3 establishes the following: "Through the respect for and promotion of Human Rights and the principles of Universal Accessibility and *Design for All*, in accordance with the provisions of Final Provision Eleven of *Law 51/2003 of December 2, 2003*

on Equal Opportunities, Non-discrimination and Universal Accessibility for the Disabled, the appropriate curricular study plans must include teachings related with those rights and principles.

One can reach an important conclusion for our project from both of these laws, both the obligatory nature of including *Design for All* and *Universal Accessibility* in any university degree program, as well as the way of doing so, given that the laws foresee it as a transversal topic which must be involved in any aspect of teaching.

Moreover, we would like to point out that, beyond just the legal requirements, bearing in mind *Design for All* is an essential process for achieving good design. As mentioned by Ben Shneiderman, "Taking into consideration a broader spectrum of situations of use forces researchers to consider a larger range of designs and often gives rise to innovations which benefit all users."

2.3.2. Regulation not only for the university and not only national

In addition the rules and regulations governing Bachelor's Degree studies, there are other laws, of a local, national and supra-national nature, as well as relevant standards and recommendations which must be taken into account when providing such teachings, from Standard UNE 170001-1:2007 on Universal Accessibility to the First National Accessibility Plan for 2004-2012.

However, it is not the objective of this publication to list all of these rules and regulations, but rather to draw attention to the need to delve further into them so as to include them in teaching practices.

2.4. Publication objective

In the *White Book of Design for All at Universities,* it is already mentioned that there are many projects in Spanish universities which deal with this topic. However, the adoption of the Bologna guidelines by the university system has led to notable changes.

In terms of the teaching of Design, it has above all led to one fundamental change: the creation of a specific Bachelor's Degree for the discipline, compared with the dispersion it suffered from beforehand. It is therefore indispensable that we create a common reference framework for including *Design for All* in these new university Bachelor's Degree programs in Design.

Such a document, regardless of how these studies are structured, would be useful for educators because it would define knowledge and skills, point out methodologies and teaching activities and open up areas to work on for educators at the levels of both the Bachelor's Degree and Graduate studies.

The document must deal with the following topics:

1. Establishing, on the basis of the range of focuses at each university, a general framework for teaching *Design for All* in the Design Bachelor's Degree programs that allows each school, regardless of its curriculum's orientation or structure, to effectively integrate the topic into its study materials. To achieve this, a Seminar was held at which Conclusions were reached for the establishment of this general framework.

2. Developing specific points regarding *Design for All* within the framework of the general knowledge and skills ("competences") acquired in the Bachelor's Degree.

3. Defining specific teaching modules to delve further into the knowledge of *Design for All*. Identifying the knowledge and skills, and the results of learning which students must acquire in those modules so as to include *Design for All* in their projects and in their future professional practices. Consequently, defining the basic contents and descriptions associated with these modules and proposing a way to integrate them into the subject matter taught in Bachelor's Degree programs.

4. Identifying and proposing the proper teaching methodologies for developing the aforementioned knowledge and skills and achieving the proposed results in learning.

5. Keeping a record of relevant sources of information on the topic.

6. Ascertaining the good practices which are being put into practice at Spanish universities, so as to create a documentary base which strengthens and supports the proposed educational strategies, as well as creating a network for cooperation within the field of educating about *Design for All*.

2.5. Defining a common framework for the different degree programs in Design

As we pointed out above, the diversity which exists in terms of Bachelor's Degree studies on Design in Spain (this also occurs in the other nearby countries, which have been implementing the Bologna accords for years) requires us to deal with the inclusion of *Design for All* in an open manner, making a proposal which allows each center of learning to be able to include it within its curriculum in a natural way.

In order for this publication to fulfill its objective of serving a reference guide, it was necessary to take a closer look at several topics: first of all, at the structure of the various Bachelor's Degree programs which were being put in place or which are going to be put in place in the upcoming years, and secondly, defining, in terms of knowledge, skills, contents, methodologies and teaching activities, how to deal with *Design for All* in those programs.

With this goal in mind, the "Seminar on Design for All in University Design Degree Programs" was held in June 2009 in Madrid. It was presided over by: Francesc Aragall, President of the Coordinadora and Director of *ProAsolutions S.L.*, Jesús Hernández Galán, Vice-President of the Coordinadora and Director of Universal Accessibility at *Fundación Once*, Juan Carlos García-Perrote, Director of the Advanced School of Art and Architecture at the *Universidad Europea de Madrid*, and Delfina Morán, Coordinator of the Bachelor's Degree in Design at the *Universidad Europea de Madrid* and member of the Scientific Committee of this project. The seminar was attended by design professors from a large portion of Spain's universities, art schools and design professionals who had worked on projects involving *Design for All*.

The objective was, first and foremost, to increase awareness about this Project amongst the main role-players involved, or in other words design professors, professionals and companies, so as to discuss not only the need to deal with the topic, but also to make it clear that there is an obvious line of work to be done already in this sense, which may serve as a foundation for the future. Along these lines, it was important for everyone to share their experiences and the projects that are being developed or have been developed, in both the professional and academic worlds, as well as building the foundations for what this publication was to become, while creating a working network which would allow us to move forward on this topic in the future.

Professionals and scholars intervened by presenting projects developed within the realm of *Design for All*. It is important to point out that in selecting these projects; the attempt was made to cover a wide range of cases and focuses.

- The project "Signposting at the *Hospital Universitario Virgen de las Nieves de Granada*," presented by Emilio Gil, Director of *Tau Diseño,* showed how to deal with the signposting at a public site, in this case a hospital, in which groups of people from different cultures and educational levels converge, making clear and intelligible signposting a vital topic.

- Along the same lines, the project "Signposting the premises of the City Hall of Campo de Criptana," presented by Dimas García, a graphic designer, proposed a system for accessible signposting from a cognitive perspective.

- Raúl Goñi, Director of *Inclusive Studio*, presented "Typesetting for All."

- Ángel García Crespo, Manager of the Information Dissemination Department of *CESyA*: the Spanish Center for Subtitling and Audio Description, and the Sub-director of the Educational Organization at the *Universidad Carlos III,* along with José Luis Pajares, a *CESyA* researcher, presented the project "GVAM, a virtual accessible guide for museums."

- Beatriz García Prosper, Professor and Sub-director for Research at the Drawing Department of the *Universidad Politécnica de Valencia,* presented the project "Parks for All."

- Fernando de la Moneda Corrochano, Director of the "Antonio López" Advanced School of Art and Design, and Prado Barba Ruiz, Head of the Department of Advanced Product Design Studies, presented the educational project "Designing for All in the Classroom." Fourth *Vitra-EASDAL* Competition.

- Paz Madrid, Irene Rodríguez Torres and Luis Miranda, of Telefónica R&D, presented "Accessibility on Websites."

- Carmen Cuesta, the Communication Director of *DDI*, took part with a speech titled "The Economic Importance of Designing for All."

This session ended by defining four broad areas of transversal contents which must be covered in any university Design degree program:

- Human diversity

- Communicative environment
- Physical environment
- Designing with users: techniques for participation

During the second part of the seminar, four work groups were created, in which the topics to be discussed in each of these areas were brought up. We have summarized them below, as well as the conclusions reached to create the foundations for defining the specific knowledge and skills which a student must acquire in the subject of *Design for All,* as well as the specific modules which must deal with the topic.

Seminar Conclusions

The conclusions reached by the four groups, gathered by María López, Victoria Pereda, Alfonso Ruiz, José Luis Pajares and Emilio Gil and summarized below, were used in some cases to establish general knowledge and skills, and in others to define the specific subject matters to be dealt with by the projects.

Among the common points found in all four areas, the following were determined:

- Students must be able to deal with social diversity as a source of wealth for their projects and as a challenge, not as a impediment, always viewing it from the perspective of sustainability.

- Students must become competent at designing products and environments which take into account the individuality within diversity, being able to distinguish and choose correctly: products for all, products in a product range, adjustable products or products compatible with the needs of each person (customized).

- Understanding design as a global process in which different disciplines play a role and complement each other.

- Understanding sustainability as a system which promotes progress and ensures quality for future generations, respecting all individuals and the environment.

- Reaching agreements and cooperation accords with Technology Centers, user-friendliness, testing and prototyping laboratories, through the network of existing technological institutes so as to obtain the necessary input from the work carried out.

- It is also essential to create a network of "knowledge about *Design for All,*" by disseminating all of the aspects of the regulations, techniques and technologies possible within our reach that make it possible to share knowledge and move ahead in research, development and innovation.

- Students must be able to deal with design projects from a perspective of "designing for change"; they must be able to detect problems in society which design can solve, by changing those aspects of the environment which do not meet needs or creating new products. All in all, they must be aware of their responsibility to society and remain prepared to live up to that responsibility.

2.5.1. Human Diversity

"What keeps the world in motion is the interaction between differences, their attractions and rejections. Life is plurality. Death is uniformity." - Octavio Paz

- Students must be familiar with the concepts of diversity, disability or deficiency, and the repercussion of these terms in cultural and social realms.

- They must also learn to think in terms of deficiencies instead of disabilities so as to propose *Design for All* solutions.

- Students must be prepared to tackle disability by identifying with it, by "putting themselves in the other person's place."

- Students must be able to appreciate the wealth of diversity in terms of habits, cultures and customs, so as to seek out integrating solutions or specific solutions, always with respect for diversity.

2.5.2. Physical Environment

As regards the physical environment, students will have to:

- Be aware of the problems all users have adapting to products and physical environments.

- Understand the existing technologies for solving users' problems, so as to apply them in the proper ways.

- Know the fundamentals of ergonomics and biomimicry.

- Know about, interpret and apply the current rules and regulations.

2.5.3. Participation Techniques to Get to Know Users

In order to get to know and detect the potential users of a product, environment or service, students must:

- Be able to understand and apply *Design for All* in a holistic way, by developing a project methodology which begins by identifying users and their needs, so as to end with design solutions.

- Be able to identify users and define their characteristics.

- Anticipate the experience of users and apply it as a guide for the formal definition of the product or environment.

- Interpret the product brief with a critical sense, as well as being able to draft a counter-brief or alternative proposal which responds to the proposals of *Design for All*.

- Know and apply the various research techniques in use (focus groups, virtual ethnography, visual anthropology, photo-anthropology, etc.) which make it possible to establish various user profiles.

- Know the basic techniques for carrying out market studies and interpreting them correctly.

2.5.4. Communicative Environment

In terms of the communicative environment, design students must:

- Know the basic concepts of *Design for All* in the specific field of communication, in terms of both physical and digital media.

- Be able to design effective communications for the wide range of existing users, regardless of their physical, sensorial or intellectual abilities.

- Be aware of their social responsibility in a field which, upon first glance, seems less critical than the physical environment.

2.6. General skills and knowledge acquired in the bachelor's degree program and Design for All

Yet again, we must provide a reminder that the reason for the legislative changes mentioned above lie, first of all, in the creation of a common European Higher Education Area. The way in which the countries that signed the Bologna Accords resolve the creation of equivalent degrees at the same time, which maintain the necessary autonomy not only between countries but also between universities, is that which we shall apply when defining how to include *Design for All* in our Bachelor's Degrees. And this means doing nothing other than stating these specific contents in terms of knowledge, skills, the results of learning and teaching methodologies.

The general agreement regarding these courses of study is that the Bachelor's Degree in Design has the objective of "training professionals capable of taking part in the development, projection and production of mankind's material and visual culture in its social, cultural, aesthetic and economic dimensions." This definition is equally incumbent upon the different professional profiles which result from the degree, including all four traditional profiles, such as those of interior designers, industrial designers, product designers, graphic designers and fashion designers, and those other profiles which are becoming even more specialized and will be increasing in importance in the very near future.

In order to achieve this objective, students must demonstrate, upon completing their Bachelor's Degree studies that they possess a body of general knowledge and skills which we shall describe below. Used as a basis for this are the knowledge and skills upon which the Bachelor's Degree in Design at the *Universidad Europea de Madrid* are based, as well as those

which are being developed in the newly created university studies in Design throughout Spain, Europe and the United States. It is also important to point out, no matter how obvious is may seem, that this knowledge and these skills are essential when developing *Design for All* projects.

It is also advisable to provide a reminder of the definition of *Design for All*, as well as the basic principles thereof.[12]

If we look only at the definition of the concept of *Design for All*, "...its activity revolves around seeking design solutions so that all people, regardless of age, gender, physical, psychological and sensorial abilities or culture, can use the spaces, products and services in their environment, and at the same time take part in the construction thereof",[13] then it is a transversal subject matter which must have a presence in every unit of educational content, being instilled throughout the entire degree program.

Because of this, we propose the development of specific points which deal with the topic throughout all of the general competences of the Bachelor's Degree. These competences, which constitute a nearly unanimous agreement in every country within our surrounding environment, and which can also be read as a profile of competences which a graduate must possess, are as follows:

2.6.1. Creative Ability

On the basis of an idea of their own, students must be able to develop innovative concepts and methodologies within the realm of graphic communication, product design, fashion and interior design and carry them out as far as the production stage. As a result:

12. The 7 Principles of Universal Design or Design for All revolve around design which may be used universally or by all people, but one must bear in mind that other factors are involved in Design, such as cost, the culture in which the design will be used, the environment, etc.; none of these can be left out either. These general Design principles are applicable and in fact are applied to Architecture, Engineering and, of course, websites and web applications, in addition to other fields of applicability.

The principles of Design for All or, as it is called in the United States, Universal Design, were compiled by: Bettye Rose Connell, Mike Jones, Ron Mace, Jim Mueller, Abir Mullick, Elaine Ostroff, Jon Sanford, Ed Steinfeld, Molly Story and Gregg Vanderheiden. >>

- The students must be capable of tackling *Design for All* with creative criteria. There is a general trend towards dealing with this topic solely from a functional perspective, leaving out the creative factor of leisure and entertainment which an inclusive design must also possess.

2.6.2. Capacity for Critical Analysis

The students must be capable of examining, analyzing, explaining and evaluating their own work and that of others, and do so with a critical sense. Therefore:

- They must be competent at evaluating a project in terms of *Design for All*, discerning whether or not it is adequate.

- They must possess realistic judgment so as to discern, for instance, between when one can and when one must propose *Design for All*, or an adjustable design, or when a customized design is required.

2.6.3. Ability to Learn Constantly and Innovate

The students must be capable of developing and increasing their professional and creative abilities. In this sense:

- They must be familiar with the technology, potential for processing and applying materials, the specific legislation and the research that has taken place on *Design for All*.

- They must take advantage of the technical conditioning factors and users themselves when proposing innovative solutions.

<< Version 2.0, of April 1, 1997, of the ***NC State University Center for Universal Design, an initiative of the College of Design****, translated and adapted by* ***Emmanuelle Gutiérrez y Restrepo****, can be found at http://www.sidar.org/recur/desdi/usable/dudt.php*

13. "White Book on Design for All at Universities," page 29.

- They should deal with design projects from a perspective of “designing for change”; they must be able to detect a problem in society which Design can resolve, by changing those aspects in our surrounding environment which are not adapted to our needs or by creating new products.

2.6.4. Planning Ability

The students must be capable of planning a work process and environment which is inspirational and functional, as well as keeping it in place throughout its entire duration. As a result:

- They must be capable of integrating users into every stage of Design, as well as planning those stages in an effective way.

2.6.5. Ability to Communicate

The students must be able to interpret a commissioned work, as well as presenting and explaining their work in an effective way and negotiating with clients and others involved. Therefore:

- They must be aware of their work as promoters of *Design for All*, along with the tasks carried out by the administration and various institutions in terms of increasing society's awareness about the importance of this subject. In this sense, their role as experts is important when it comes to analyzing whether a commissioned work has been properly conceived or whether it needs to be re-examined.

- They must be able to establish effective communication with users in order to become aware of their needs and opinions. In this sense, they must request the proper specialized support when it is necessary.

2.6.6. Ability to Instill Projects with a Social and Cultural Dimension

The students must be able to establish relationships between their own work and that performed by others, and between their own work and the public. Specifically in terms of *Design for All*, the students:

- Must focus their designs on users and acquire the knowledge necessary to become adapted to those users.

- Must demonstrate that they have a well-formed opinion on the place held and function performed by Design and designers in a pluralistic and diverse society, and their responsibility to that society.

2.6.7. Ability to Work in Teams

The students must be able to actively contribute to product or process development within a collaborative working environment. As a result, they must be capable of:

- Orchestrating the various roles and responsibilities which form part of the design and production process in a respectful, effective manner.

- Integrating users as active agents throughout every stage in design.

- Establishing networks of cooperation with designers or with specialists from other disciplines, such as engineers, chemists and people who specialize in different subjects so as to achieve a more all-encompassing viewpoint and adequate design, given the complexity sometimes involved in *Design for All*.

2.7. Defining specific Design for All modules

In addition to the general competences in *Design for All,* which are of a transversal nature, in order to provide a proper education on this topic, it is necessary to define the specific contents to be taught, as well as the proper methodologies to use when teaching them.

On the basis of the four thematic areas defined during the seminar, it is within reason to propose for thematic blocks, each of which is to be made up of five teaching modules, using a versatile system that can serve as a guide for all educational institutions and allow them to include teaching units in the most appropriate subjects, regardless of what is in each university's study plan.

As for the study load to be spent on the five blocks, and whether or not they should be required or optional, the following is proposed as a set of guidelines:

- Each block will have a study load of 6 ECTS (European Credit Transfer System credits), and the modules will range from 1 to 2 ECTS, though this is a minimum proposal which each school may expand upon.

- It is important to point out that each block includes a module called the "Integration Workshop" in which *Design for All* projects are to be developed to put what has been learned in the rest of the modules into practice.

- Regarding whether the blocks should be of a required or optional nature, Thematic Block 1 and Thematic Block 2 are required. Blocks 3 and 4 will be either required or optional depending upon the structure of the studies at each school.

The following is a description of the four blocks and the teaching modules which they include:

Thematic Blocks	ECTS	Módulos didáctilo
Thematic Block 1. Human Diversity	6	MD1. Fundamental concepts. Diversity, disability and deficiency (2 ECTS) MD2. Cultural diversity (1 ECTS) MD3. Physical diversity (1 ECTS) MD4. Cognitive diversity (1 ECTS) MD5. Integration Workshop (1 ECTS)
Thematic Block 2. Participation Techniques. Getting to know Users	6	MD1. Getting to know our users (1 ECTS) MD2. Analyzing users (1 ECTS) MD3. Designing for our users. Analysis and evaluation of ideas and requirements (1 ECTS) MD4. Evaluating our designs (1 ECTS) MD5. Integration Workshop (2 ECTS)
Thematic Block 3. Communicative Environment	6	MD1. Communication and diversity. Physical, cognitive and culturalconditioning factors (1 ECTS) MD2. New technologies and accessibility. Interaction with information systems (1 ECTS) MD3. Specific technologies for inclusive communication (1 ECTS) MD4. Legislation, regulations and recommendations (1 ECTS) MD5. Integration Workshop (2 ECTS)
Thematic Block 4. Physical World	6	MD1. Interaction with space (1 ECTS) MD2. Interaction with objects (1 ECTS) MD3. Legislation, regulations and recommendations (1 ECTS) MD4. Specific technologies for creating accessible and safe design from a technical and functional perspective (1 ECTS) MD5. Integration Workshop (2 ECTS)

BREAKDOWN OF THE THEMATIC BLOCKS

Thematic Block 1. Human Diversity

(6 ECTS – 150 hours)

Learning objectives for students

- Getting to know the principles of *Design for All*, the historical changes in the concept and the current way it is conceived, so as to develop a positive view of accessibility and *Design for All*, reaching an understanding of it as a benefit and not a restriction.

- Getting to know the main national and international entities responsible for the development and spread of *Design for All*.

- Integrating the concepts of physical, cultural and cognitive diversity and the effects of that diversity on their work as designers.

- Being able to appreciate the wealth of diversity in terms of habits, cultures and customs in order to seek out integrating design solutions or specific solutions, always with respect for diversity.

- Learning to think in terms of deficiencies instead of disabilities when coming up with solutions involving *Design for All*.

- Becoming familiar with the basic sources of information on *Design for All* and diversity: legislation, statistical information, etc.

Summary of contents

MD 1. Introduction at Design for All. (2 ECTS)

- *Design for All*: basic concepts.
- Historical changes in the concept.
- Fundamental concepts. Diversity, disability and deficiency.
- Autonomous regional, national and supranational legislation and regulations.
- National and international entities which develop and spread *Design for All*.
- Relevant sources of information.

MD 2. Cultural diversity. (1 ECTS)

- Basic sources and techniques for learning about and analyzing the cultural diversity of users.
- Cultural diversity and its influence on the process to design space, objects and communications.

MD 3. Physical diversity. (1 ECTS)

- Basic sources and techniques for learning about and analyzing the physical diversity of users.

- Physical diversity and its influence on the process to design spaces, objects and communications. *Design for All* and specific needs.

MD 4. Cognitive diversity. (1 ECTS)

- Basic sources and techniques for learning about and analyzing the cognitive diversity of users.

- Cognitive diversity and its influence on the process to design spaces, objects and communications. *Design for All* and specific needs.

MD 5. Integration Workshop (1 ECTS)

- Diversity as a creative force. Project methodology.

Thematic Block 2. Designing with Users. Participation Methodologie.

(6 ECTS - 150 hours)

Learning objectives for students

- Knowing the fundamental concepts of *User-Centered Design* and every step of the process.

- Being able to identify potential users and define their characteristics.

- Anticipating the users' experience and using it as a guide to formally define the product or environment.

- Learning about and knowing how to implement the various research techniques in use which make it possible to establish all of the different user profiles.

- Learning the basic techniques for detecting user needs, as well as knowing how to interpret them properly and translate them into design proposals.

- Showing the key steps in a *User-Centered Design* process in a practical way.

Summary of contents

MD 1. Fundamental concepts of *User-Centered Design*.

MD 2. Defining the needs of users

- Basic techniques for the detection, identification and hierarchicalization of users' needs.

MD 3. Data analysis and the creative process

- Data categorization (Card sorting): in those projects in which data may be organized in different ways, users must provide their point of view on how it would be easier for them to find the information they are looking for.

- Analysis and evaluation of ideas and requirements: once the ideas have been defined, they must be evaluated and then transformed into the requirements which the design will include.

- Brainstorming: technique of creative enablement in which different people, including the very users themselves, propose ideas to achieve an objective.

MD 4. The evaluation process

- Heuristic analysis: putting oneself in the users' skin.

- User test: using this technique one observes how a representative sample of users makes use of a product so as to obtain information and data on the product, as well as determining the problems or difficulties which they encounter when using it.

- Prototyping: this will allow us to have several options available at a low cost before carrying out the serial manufacturing of the product, through different rapid design techniques.

MD 5. Integration Workshop

- Development of projects in accordance with the *User-Centered Design* methodology.

Thematic Block 3. Communicative Environment

(6 ECTS - 150 hours).

Learning objectives for students

- Getting to know the basic concepts of *Design for All* applied to their communication projects, in both physical media and digital media.

- Being able to design effective communications for the wide range of users, regardless of their physical, sensorial or intellectual capabilities.

- Discerning when a *Design for All* project must be taken on and when specific applications should be developed, with awareness about the limitations set, in general, by technology.

- In relation with the preceding point, students must be familiar with the technological developments in this field, so as to design accessible systems.

- Being able to design understandable objects and environments: any user must be able to get oriented without difficult in a specific space, by using the proper graphic and material resources.

Summary of contents

MD 1. Communication and diversity

- Physical, cognitive and cultural conditioning factors.

- Systems of symbols, colors, lighting and typesetting which allow for effective communication to all people.

MD 2. Signposting systems

- *Design for All*, specific needs and solutions. New technologies and accessibility.

MD3. Systems and specific technologies for inclusive communication.

- Specific systems for different deficiencies: tactile systems, sound-based systems, etc.

- Interaction with information systems.

MD 4. Legislation, regulations and recommendations.

MD 5. Integration Workshop.

- Development of accessible communication projects.

Thematic Block 4. Physical Environment

(6 ECTS - 150 hours).

Learning objectives for students

- Being able to design safe objects and environments: they must not create any risk to users. Therefore, all of the elements which form part of an environment or product must be designed while taking into account safety, avoiding the following, for example: slippery floors, protruding sections, small dimensions, etc.

- Being able to design healthy objects and environments: they must not constitute any risk to people's health or cause any inconveniences to those people who suffer from some disease or allergy. Even the healthy use of products and spaces must be promoted, with special attention placed on the choice of materials for environments and objects, as well as their colors (user interfaces).

- Being able to design objects and environments which take into account individuality within diversity, with the ability to make proper distinctions and choices: products for all,

products from product ranges, adjustable products and products compatible with each person's needs and characteristics (customized).

- The objects and environments which they design must be funcional, in such a way that the functions for which they were created can be carried out without any problems on difficulty.

- Being able to design understandable objects and environments: any user must be able to get oriented within a space an interact with the objects with difficulty.

- Being familiar with the existing technologies for solving the users' problems so as to be able to make proper use of them.

- Learning about and knowing how to interpret and apply the current rules and regulations in force regarding this subject matter.

Summary of contents

MD 1. Interaction with space

- Accessible spaces, understandable spaces and safe spaces.

- Relationship between the design of spaces and their signposting.

MD 2. Interaction with objects

- Applied ergonomics.

- Design and function.

- Design of interaction.

MD 3. Legislation, regulations and recommendations

MD 4. Technologies and specific materials for creating accessible and safe designs from a technical and functional perspective.

MD 5. Integration workshop

- Development of projects for designing objects and accessible spaces.

2.8. Teaching Methodologies

The educational model which is proposed by the Bologna reform hardly differs from that which was always followed in teaching Design: independent learning, team work, learning based on projects, and the role of the professor as a facilitator of learning more than as a possessor of all truths: these form the very foundation of teaching in this discipline. In the case of the topic at hand, because in many cases it deals with highly specialized contents, two further role-players are made essential within this learning process: first of all, experts in the various subject matters and, secondly, users as indispensable role-players in the development of certain topics, such as the integration workshops.

Amongst the most appropriate and effective methodologies[14] for developing the curricula which include *Design for All,* we may mention the following:

a) Master Class: taught by the professor and experts on the topic in order to acquire updated, well-organized information originating from various sources which are difficult for students to access. The idea in doing this is to facilitate the understanding and application of specific *Design for All* procedures, while raising students' levels of motivation about *Design for All*.

b) Work Seminars: these make it possible to explore a selected topic as a group and in further depth. The professor takes on the role of expert and encourages students. These are critical work sessions with guided debated promoted by the professor both inside and outside of the classroom. It is a methodology which involves analyzing a series of readings, critical discussion about the concepts dealt with in those readings and the writing of a report for

14. Fernández March, A. "Nuevas Metodologías Docentes" ("New Teaching Methods") Instituto de Ciencias de la Educación. Universidad Politécnica de Valencia, 2005, (http://campus.usal.es/~ofeees/NUEVAS_ METODOLOGIAS/nuevas_metodologias_docentes.doc)

synthesis. This methodology is especially appropriate, as well as on other occasions, for studying legislation and interpreting it properly.

c) Case Studies: the holistic analysis of situations taken from the real world, along with solutions and projects (from both the professional world and academia) achieves highly effective learning due to a process in which the student identifies with those circumstances. Not only is the analysis of *Design for All* solutions important, but also the methodology followed throughout the design process.

d) Learning Through Problem-Solving: this is probably one of the most interesting methodologies for dealing with *Design for All* in classrooms. The unique part of the method is that the problem to be solved is a problem about which the students have not received any particular training, which forces them not only to seek solutions, but also to re-define the problem itself. It is a method which involves putting the different areas of knowledge about *Design for All* into play in order to find a solution for the problem.

Whereas traditionally the information has first been explained and then its use sought out in resolving a problem, when using the method of "problem-based learning," the problem is presented first, the learning needs are identified and the necessary information is sought and, last of all, one returns to the problem to be solved.

This method is an attempt to motivate students to enjoy learning by stimulating their creativity, their ability to analyze and their responsibility in solving problems, all of which form part of reality.[15]

15. "El Aprendizaje Basado en Problemas como técnica didáctica" ("Problem-Based Learning as a Teaching Technique") Dirección de Investigación y Desarrollo Educativo, Vicerrectoría Académica, Instituto Tecnológico y de Estudios Superiores de Monterrey. (http://www.ub.es/mercanti/abp.pdf.)

e) Proposal of Projects: this methodology is and has always been the foundation of learning in Design. It has the objective of putting into practice a method or ensemble of knowledge for use in a real or fictitious project. To do so, the students must analyze the problem involved in the project, propose and implement a solution, and later evaluate that proposition. It is a technique which complements the preceding technique, because it involves the development of a project methodology. Both are essential in the teaching modules proposed in this document which are referred to as the "Integration Workshops," in which the students must be able to understand and apply *Design for All* in a holistic manner, by developing a project methodology which begins by identifying the users and their needs, then ending the process with design solutions.

f) Educational Games: these share the same characteristics as social games (several players, a set of rules to be adhered to and objectives to be achieved), but in this case they end with the acquisition of newly learned knowledge and skills. The simulation of real situations through the game leads to working on subject matter which is both conceptual and methodological in the topics of interest. It is especially important in learning *Design for All* because it allows students "to put themselves in the place of others," get a much more accurate view of the effect of all the different deficiencies and find out what the real needs of the people for whom they design are.

g) Indipendent Learning: all of the activities which pursue the promotion of this type of work (learning contracts, internships, reading programs, teaching by individualized opinion leaders, etc.) May be oriented towards strengthening the common transversal competences within the realm of *Universal Accessibility* and *Design for All*.

2.9. Other complementary educational strategies

Defined in the above sections are the contents of the subject of *Design for All* which must be taught throughout the course of the Bachelor's Degree. In this section, we propose other educational strategies that will make it possible to gain an even deeper knowledge of the topic:

a) Professional Internship

The new university Bachelor's Degrees include, as a required subject with a minimum course load of 12 ECTS credits, a professional internship. From everything explained in this document, one can clearly conclude that there is a need for a commitment by centers of learning to promote the completion of internships by students, at design companies which possess experience in carrying out projects in accordance with *Design for All* criteria. Similarly, because the professional internship is performed in the final stage of the Bachelor's Degree program, the knowledge and experience which the students have acquired on that topic throughout their studies may provide extraordinary momentum for the inclusion of good practices in design companies which have little experience with *Design for All*. Naturally, this experience must also be extrapolated to professional Design Associations.

Many recommendations come out of the responsible entities in this sense. For example, we could mention the IDCnet network, which has produced extensive documentation about the way to include *Design for All* in the curricula of Engineering programs and Design studies. Point 5.2.3 of one of its document[16] of conclusions recommends "Promoting the sharing of knowledge between industry and education":

"Industry and educational institutions must interact on a regular basis to identify and

16. *Carlos A. Velasco (FIT) "IDCnet: Inclusive Design Curriculum Network: IST–2001–38786 IDCnet. D1.4a Summary of key findings from IDCnet". (http://www.idcnet.info /documents)*

update the industry's needs with regard to teaching and knowledge about *Design for All*. Interaction is also required in order to improve the sharing of knowledge about *Design for All* which, through teaching and education, takes place thanks to educational institutions. [...] The role of professional networks (such as BEDA and the national designers' associations) and networks of universities (such as Cumulus) must also be strengthened."

b) End of Bachelor's Degree Program Project

Point 6 of this document, "General Skills and Knowledge of the Bachelor's Degree in Design and *Design for All*" completes the profile of a graduate who has earned a Bachelor's Degree in Design, a profile whose achievements are put into practice in the End of Bachelor's Degree Program Project. Because of this, any project completed in this stage must demonstrate the acquisition of the competences and knowledge described in this publication.

Moreover, it seems logical that the faculty must spur students to propose End of Bachelor's Degree Program Projects which allow them to perform a more in-depth examination of that knowledge and those competences.

c) Graduate Studies

This publication focuses on the Bachelor's Degree study programs and proposes a generic way to include *Design for All* in them. The proposed system, however, could be used just as a foundation, with later development of a specialized Master's Degree program in *Design for All* and the achievement of the highest level within the university's educational system, the Doctorate.

This document may also be used as a guide for Master's Degree programs in all of the different subjects which are supposed to include *Design for All* as a part of their educational curriculum.

d) Complementary Training Activities

Throughout their years of education, students take part in a large number of training activities which are complementary to their official curricular education: conferences, workshops, competitions, seminars, etc.

In order for these activities to become truly educational, they must be related with the official subjects in the curriculum, while using the classroom to place an emphasis on their importance and getting students interested in them. They constitute an extraordinary opportunity to cooperate with the institutions responsible for the development and promotion of *Design for All*, as well as with design professionals with experience on the subject matter.

e) Teacher Training

Although the profile of the design professor is mostly mixed, because they often combine their teaching activity with professional work, it is essential for them to have specific training on the topic of *Design for All*.

To achieve this goal, training courses and seminars must be organized for educators and held jointly amongst the departments responsible for the ongoing training of education and research staffs and entities with expertise in *Design for All*.

3.

MEMBERS OF THE DRAFTING COMMITTEE

3. MEMBERS OF THE DRAFTING COMMITTEE

The people who have cooperated to help draft this document by taking part in the Seminar and forming part of the Drafting Committee, with the objective of carrying out the combined task of producing this document titled *Creating a Design for All Curriculum in Architecture,* were as follows:

- **José Alberca.** Professor, Universidad Europea de Madrid
- **Licinia Aliberti.** Professor, Universidad Europea de Madrid
- **Francesc Aragall.** President of the Coordinadora del Diseño para Todas las Personas en España and Managing Director of ProAsolution, SL
- **Fefa Álvarez.** Head of the Department of Accessibility to the Physical Environment at Fundación ONCE
- **Roberta Barban.** Professor, Universidad Europea de Madrid
- **Imma Bonet.** Executive Patron of the Design for All Foundation
- **Enrique Bordes.** Professor, Universidad Europea de Madrid
- **Alfredo Calosci.** Designer
- **Anna Calvera.** Professor, Universidad de Barcelona
- **Carmen Cuesta.** Communication Director at DDI
- **Javier Fernández.** Education Director at DIMAD
- **María Fullaondo.** Professor, Universidad Europea de Madrid

- **Beatriz García.** Professor, Universidad Politécnica de Valencia
- **Emilio Gil.** Professor, Universidad Europea de Madrid
- **Rocío Gómez.** Professor, Universidad de Vigo
- **Raúl Goñi.** Designer
- **Jesús Hernández.** Vice-President of the Coordinator of Design for All People and Director of Universal Accessibility at Fundación ONCE
- **Marcelo Leslabay.** Madrid School of Decorative Arts
- **María López.** Professor, Universidad Europea de Madrid
- **Paz Madrid.** Telefónica Research and Development
- **Ciro Márquez.** Professor, Universidad Europea de Madrid
- **Grego Matos.** Professor, Universidad Europea de Madrid
- **Fernando de la Moneda.** "Antonio López" Advanced School of Art and Design
- **Pilar Montero.** Professor, Universidad Europea de Madrid
- **Delfina Morán.** Professor at the Advanced School of Art and Architecture, Universidad Europea de Madrid. Department of Graphic Expression and Design and coordinator of the seminar on Design degree programs
- **Lucinda Morrisey.** Professor, Universidad Europea de Madrid
- **Guillermo Navarro.** Universidad de Castilla-La Mancha
- **José Luis Pajares.** Researcher at Universidad Carlos III de Madrid

- **Mercedes Peláez.** Professor, Universidad Europea de Madrid
- **Raquel Pelta.** Universidad de Barcelona
- **Barba Prado.** "Antonio López" Advanced School of Art and Design
- **Nuria Rodríguez.** Universidad de Málaga
- **Irene Rodríguez.** Telefónica Research and Development
- **Raúl Ruiz.** Professor, Universidad de La Laguna
- **Julio Sanz.** Universidad de Castilla-La Mancha
- **Antonio Serrano.** Professor, Universidad Europea de Madrid
- **Cristina Varela.** Professor, Universidad de Vigo

4.

MEMBERS OF THE SCIENTIFIC COMMITTEE

4. MEMBERS OF THE SCIENTIFIC COMMITTEE

In order to ensure the consolidation of the project's objectives, it was essential to ensure the involvement of those role-players most directly involved in the university degree programs chosen for the project, as well as experts in *Design for All* at the national and European levels.

As a result, the Scientific Committee was made up of the following members:

- **Francesc Aragall.** President of the Coordinadora del Diseño para Todas las Personas en España and Managing Director of ProAsolutions, SL
- **Jesús Hernández.** Vice-President of the Coordinadora del Diseño para Todas las Persona en España and Director of Universal Accessibility of the Fundación ONCE
- **Avril Accolla.** Vice-President of the EIDD-Design for All Europe
- **Julio Abascal.** Tenured Professor of Architecture and Computer Technology, Universidad del País Vasco
- **Francisco Alcantud.** Professor and Deputy Rector for the integration of people with disabilities, Universidad de Valencia
- **Nestor Garay.** Professor of the Department of Architecture and Computer Technology, Universidad del País Vasco
- **Daniel Guash.** Academic Director of the Accessibility Professorship, Universidad Politécnica de Cataluña
- **José Antonio Juncà.** Doctor of Road, Channel and Port Engineering

- **Consuelo del Moral.** Professor of the Advanced Technical School of Architecture, Universidad de Granada
- **Delfina Morán.** Professor of the Advanced School of Art and Architecture, Universidad Europea de Madrid. Department of Graphic Expression and Design
- **Nieves Navarro.** Director of Management and Campus Coordinator, Universidad Politécnica de Madrid
- **Fernando Rodríguez.** Professor and End-of-Degree Project Coordinator at the Advanced Technical School of Road, Channel and Port Engineering, Universidad Politécnica de Madrid
- **Juan Santamera.** Director of the Advanced Technical School of Road, Channel and Port Engineering, Universidad Politécnica de Madrid
- **Javier Suárez.** Sub-Director of the University School of Technical and Industrial Engineering, in Gijónn
- **Miguel Ángel Valero.** Professor of the University School of Technical Engineering of Telecommunications, Universidad Politécnica de Madrid
- **Fefa Álvarez.** Head of the Department of Accessibility to the Physical Environment at the Fundación ONCE
- **Imma Bonet.** Secretary of the Coordinadora del Diseño para Todas las Personas en España and project coordinator

5.

MEMBERS OF THE COORDINADORA DEL DISEÑO PARA TODAS LAS PERSONAS EN ESPAÑA

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Coordinadora del Diseño para Todas las Personas en España

Founded in the year of 1996, the Coordinadora attempts to bring together all those entities, administrations, companies and professional firms which are interested in *Design for All*.

The Coordinadora is a member of *EIDD-Design for All Europe* and represents Spain in this European association of a federal nature which has promoted and increased awareness about *Design for All* in Europe since 1993.

Members of the Coordinadora:

- ADIR-BIZGORRE, Bilbao
- ADP - Asociación de Diseñadores Profesionales, Barcelona
- BCD - Barcelona Centro de Diseño, Barcelona
- ALTRO DESIGN, Barcelona
- DESIGN FOR THE WORLD, Barcelona
- ELISAVA - Escola de Disseny, Barcelona
- ESCOLA MASSANA - Centre d'Art i Disseny, Barcelona
- ESDi - Escola Superior de Disseny, Barcelona

- FUNDACIÓ INSTITUT GUTTMANN, Barcelona
- FUNDACIÓN ONCE, Madrid
- IMSERSO (Instituto de Mayores y Servicios Sociales) - CEAPAT (Centro Estatal de Autonomía Personal y Ayudas Técnicas), Madrid
- ISTITUTO EUROPEO DI DESIGN, Barcelona, Madrid
- LAI - Escola de Disseny, Barcelona
- PROASOLUTIONS SL, Barcelona

CREDITS

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Instituto de Mayores y Servicios Sociales (IMSERSO)
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Writing and Coordination
Consuelo del Moral

Compiled
Imma Bonet

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Altro Design

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Bianca Benenti

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