METHODOLOGICAL GUIDE

FOR THE CREATION OF

VIRTUAL ACCESSIBLE

CURRICULUM DEVELOPMENTS

Methodological Guide for the Creation of Virtual Accessible Curriculum Developments

Second Edition

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FINANCED BY
THE EUROPEAN UNION

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- Disabled People's International

- International Social Security Association (ISSA)

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PROLOGUE

Virtual Education is growing every time more, not only in higher education institutions, but also in education at work, school, among others. The institutions of higher education have identified its three main functions, which exist to achieve the goal of the institution of contemporaneous higher education: teaching, investigation and extension.

In relation to the teaching function, the digital educational platforms and the new virtual spaces, nowadays exist in many higher education institutions in Ibero-America. Nonetheless, as the campus may have physical limitations, the platforms and the virtual curriculum development have limitations for people with disability.

In general, this obstacle is presented to any person who has a temporary limitation, depending of the way in which he uses the virtual platforms. On the point of view of the extension function, it is interpreted as taking the knowledge out of the institutions to the workplace, as well as the projection that goes with social demands.

In the framework of the XXII Ibero-American Summit of Heads of State, held in Cádiz, Spain (2012), year 2013 was declared the Ibero-American Year for Labor Inclusion of People with Disability. This has been a motivation for higher education institutions to provide people with disability with the opportunity to obtain the competences that allow them to be included in the workplace, taking into account that accessible virtual education gives a great inclusive value. That is why we have to look for an universal design of our virtual education proposals.

Additionally, the technological and cultural advances on the internet are producing diverse changes very fast. And this speed is what requires higher education institutions to apply its investigation function to adapt to the needs of the Information Society, and in a certain way, to pursue the objective of leading through innovation in education, this evolution of society.

To this effect, in the framework of the International Day of People with Disability in 2014, the Secretary General of United Nations, Mr. Ban Ki-Moon has stated: "Let's do all that is necessary to be sure that the policies, the programs, the guidelines and the technologies of the XXI century are available to people with disability and take into account their perspectives and experiences", a new message that demonstrates the latent interest towards the inclusion of people with disability in society.

For that, the higher education institutions have to pursue excellence through processes that guarantee quality in accessible virtual education from a holistic perspective, which involves all the processes and phases of virtual education, and at the same time embraces every person. That is the reason why it emphasizes on accessibility.

To focus these objectives in Ibero-America through actions such as the ones financed by the European Commission through the ALFA program, provides an ideal platform to promote progress in the region.

One of the projects financed through the ALFA III program is the "ESVI-AL project (Virtual Inclusive Higher Education - Latin America): Improvement of Accessibility in Virtual Higher Education in Latin America."

As part of the ESVI-AL project, this methodological guide has been elaborated for the establishment of virtual accessible curriculum development. This is the second edition for the book "*Methodological Guide for the implantation of virtual accessible curriculum developments*", this edition has a new title: "*Methodological guide for the creation of virtual accessible curriculum developments*", with a focus on the change of the action "*implementation*", to a wider angle when describing the "*creation*" of the virtual curriculum developments with accessibility features. The objective of this guide is to establish a working model for the fulfilment of requirements and standards of accessibility in the context of virtual education. The proposed model will facilitate the elaboration of audits that allows the diagnosis of accomplishment in accessibility norms, and the improvement in the maturity capability, with respect to the accessibility of higher education institutions and in general, for educational organizations.

This guide has been conceived as an instrument of support for all the ones involved in virtual accessible educational projects, mainly for teachers, but also for the management, administration and technic personnel of the institutions that want to establish virtual inclusive educational activities, in which students with or without a disability can participate on an equal conditions.

What the reader will find in this book is the revised second edition of a proposal of the processes that should be implemented in a higher education institution, but also in any virtual education organization or company, that is committed to a high-quality inclusive education. In the guide, the activities and tasks that should be carried out in all of the defined processes are detailed, as well as the products, techniques, methods, quality criteria and participant profiles that should be taken into account in each phase of a virtual educational project that will be held in a virtual accessible campus, that is to say, usable and attainable by every person. The second edition was taken from the results of the experiences of offering and implementing the proposed processes in different workshops throughout several Latin American countries. This new edition was prepared with the aim to guide the reader on the main products that the tasks are intended to obtain. Also the main techniques proposed to get the results are detailed, highlighting the quality criteria metrics to evaluate the products part of the virtual accessible educational project.

This work has been possible thanks to the close collaboration in its organization between the partners and collaborators of the project of the ESVI-AL Program.

We thank the work done by the partners, collaborator and, specially, the external revisers, whose contributions and suggestions have enriched the guide.

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1. INTRODUCTION

1.1. OBJETIVE OF THE GUIDE

To provide educational systems in all levels, as well as teaching during one's lifetime is a commitment of the States that are part of the United Nations Organization (UN, 2006), which should assure people with disability have access to primary and secondary education, higher education, professional training, adult education and learning during a lifetime without discrimination and in equality with the rest.

To progress towards an inclusive education goes through a progressive and essential increase of the alternative practices of education based on the Information and Communications Technologies (ICT), through the establishment of virtual education modalities at an accessible distance.

As a contribution of the ESVI-AL project, to collaborate with obtaining virtual educational programs, this guide comes up. This guide is based on a previously elaborated material during the project, which was published as reports about: the state of accessibility in education (ESVIAL, 2012a; Restrepo et al., 2012a), about the support technology brings to the education of people with disability (ESVIAL, 2012b; Restrepo et al., 2012b), about the standards and legislation on accessibility and accessible design (ESVIAL, 2012c; Varela et al., 2012; Amado-Salvatierra et al, 2012), about the open educational resources that could help the virtual education of people with disability (ESVIAL, 2012d; Teixeira et al., 2012a; Teixeira et al., 2012b), about the technologies of semantic and social web applied to accessibility   (ESVIAL, 2012e; Piedra et al., 2012) and about the standards, norms and models of maturity capacity related to the quality and accessibility of virtual education (ESVIAL, 2012f; García et al, 2012; Cano et al., 2012).

The conclusion of the previous studies carried out, is that there is still a long road ahead to get the organizations of virtual education to offer quality and accessible virtual educational programs. This is why it becomes necessary to give them support tools, so there is progress in this sense, and that is the reason why this guide comes up.

The guide has as a main objective to establish a working model for the fulfillment of requirements and standards of accessibility in the context of virtual education, especially through the web. The proposed model will facilitate the elaboration of audits that permit the diagnosis of fulfilment of accessibility norms, and the improvement in the capacity of maturity of the educational organizations, as well as to facilitate the diverse tools that permit its establishment and the correction of possible abnormalities that could come up with respect to accessibility.

The fulfillment of standards and recommendations that are broadly accepted is also an objective of the proposed methodology. With that, the establishment of a common language that permits the collaboration in a determined area of the human activity is intended. The standards have been one of the pillars of progress in all of the fields in human activity, making it possible, for example, for the internet to be a reality nowadays.

The space of virtual education or e-learning is not contrary to the need of adjusting different aspects related to this modality in education, nowadays being identified more than a hundred standards related to this field (Hilera and Hoya, 2010), among them there are those related to quality and accessibility in virtual education.

For the elaboration of the methodological guide presented in this book, the existing standards that either way could be involved in an accessible virtual educational program have been taken into account, so that the proposed methodology is the most universal as possible (ESVIAL, 2012c, 2012f). It is about ensuring the access to virtual education to any student, independently from its access characteristics and context of use, integrating the students with disability in an inclusive way, according to the guidelines of UNESCO (2009).

To this effect, the own structure of processes of the guide has been created to comply with an international standard. It is about ISO/IEC 19796 standard, which in its first part establishes the categories of processes that should be considered for the information and communication systems in learning, education and formation. (ISO, 2005). The current edition takes into account the draft of the forthcoming ISO/IEC 36000 standard, to be published in year 2015. It is a revision of the ISO/IEC 19796 standard, which is currently implemented in different educational institutions.

It is convenient to highlight that it is not the objective of this guide to make an exhaustive study of the proposals and investigations on the accessibility in virtual education, but to make a proposal of activities that the authors consider basic to bear in mind in every educational project of this type, that can be understandable by any user of the guide, with the objective of it being an useful instrument.

There are excellent works, which we recommend to consult to complement the contents in this guide. Some of them are quoted along the chapters. Reading the reports of the ESVI-AL project, already quoted in this paragraphs, is a good starting point, and also others that have discussed and keep discussing this topic in one way or another, as the monographic about adaptation and accessibility of the technologies for learning, edited by Boticario et al. (2010) which includes, among others, articles about standards for an adaptive and accessible e-learning (Alonso et al. (2010), about heterogeneous adaptive systems (Mérida et al., 2010) or about accessible audiovisual educational contents. Reading the works mentioned can be a good starting point for those interested in digging into this field, for what we also recommend to consult other works published in specialized congresses and magazines, as the ones quoted in (Hilera, 2012), as well as the web sites of important projects that investigate about the matter, as EU4ALL (2012), A2UN@ (2012), Adaptaplan (2007), aLFanet (2005), Alter-Nativa (2013), or projects handled by the European Agency for Development in Special Needs Education (EA, 2013b).

In the following paragraphs of this first chapter there is a presentation about the main elements of the methodology that is presented in this guide, starting with the structure of proposed processes or stages that should be considered when carrying out a virtual accessible educational program, and continuing with the components that are part of said processes. The chapter ends with a section

dedicated to some advices for applying the methodology, which gives the reader some guidelines to make better use of the contents in the guide.

Chapters 2 to 8 of the book are oriented to a more detailed description of each of the seven processes of the life cycle of an educational program, with practical information to be able to apply the foundations on which the methodology is based.

1.2. LIFE CYCLE MODEL OF A VIRTUAL ACCESSIBLE EDUCATIONAL PROGRAM

A life cycle model of a virtual accessible educational project has to establish the processes or stages that should be carried out in the making of any project of this type, since its initial conception to its ending, from there comes the term "life cycle".

Each one of these processes that form part of the life cycle can be divided into sub-processes, with the objective of dividing the job to do and to make it easier to perform the task at hand. In this methodology, it has been chosen to divide it in two levels, and to label each one of the sub-processes into which the main processes are divided into as ACTIVITY, and each sub-process into which each activity is divided as TASK, such as it is shown in the diagram of picture 1.1

```
PROCESO
   └─Se descompone en ACTIVIDADES
             └─Se descompone en TAREAS
                       └─Se describe con ──RESULTADOS
                                          ──TÉCNICAS
                                          ──MÉTRICAS
                                          └─PARTICIPANTES
```
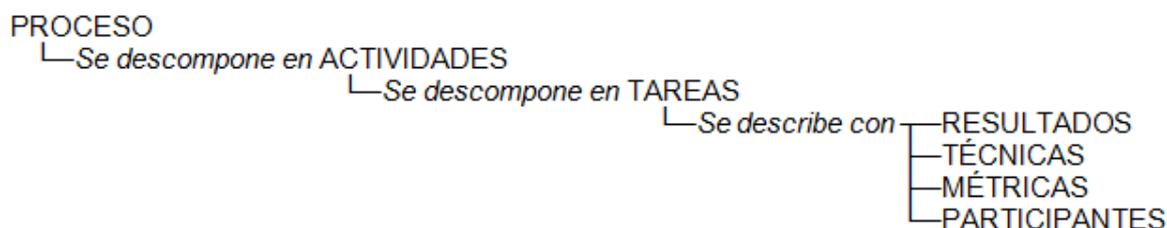
Picture 1.1. Elements of the proposed methodology

As it is indicated in the diagram, for each one of the tasks, as a basic unit of work, the methodology establishes the results that should be obtained at the end of said tasks and its characterization, as well as the techniques to be applied during these, the metrics or quality criteria that will permit the verification of the correct execution of the task, as well as those involved who participate in the making of the task. This way, following the established instruction for all the tasks in which the activity is separated, the accomplishment of the methodology will be assured at all levels: task, activity and main process.

It is important to highlight that the model of the proposed life cycle is based on the approach of the development centered in the user, considering the different types of needs of the students to whom the education is directed from the beginning of a virtual educational project. For an educational activity to really be inclusive, it has to consider the user since his first conception. This is why, in the description of the elements of the methodology (activities, tasks, results, techniques, metrics and participants), the previous proposals in the ambit of the development centred in the user have been taken into account, including, for example, the USERfit methodology (Poulson et al., 1996), the proposal of Henry (2008), international reference standards (ISO, 2000; 2002; 2009; 2010a; 2010b), or recommendations of the World Wide Web Consortium (W3C, 2004).

The processes or main stages established by the methodology coincide with the seven categories of processes established by the ISO/IEC 19796-1 (ISO, 2005) standard and are completed with the revision of the forthcoming ISO/IEC 36000 standard. It is about the processes shown in picture 1.2. Although in the picture the processes are shown all set in sequence, it has to be understood that this is only done for a better understanding of the life cycle model, as it will be the usual sequence in making an educational project. Notwithstanding, that does not mean necessarily that a process has to be complete to start with the next. There will be activities included in a process that will be carried out simultaneously with other activities from other process. The methodology does not establish restrictions in the order of execution among activities from different processes, only in the activities of the same process. In paragraph 1.4 of this guide some possible options to order the execution of the processes are suggested, as the previous step to the application of the methodology in the case of the development of a course has to be the establishment of the specific life cycle to be applied in said project, as it will be an instantiation or particular version of the model of life cycle that we present here.

Picture 1.2. Model of processes of the life cycle of a virtual accessible educational project

Thence, to comply with the methodology presented in this guide, a supplier of accessible virtual education has to establish the necessary mechanics in its organization to implement each one of these seven processes, establishing the life cycle that is more convenient as a way to order and link the processes in each educational project in particular. The objectives of the processes will be the following:

Needs Analysis (NA):

The objective of the needs analysis process is to identify and describe the requirements, demands and restrictions of a virtual accessible educational project.

Framework Analysis (FA):

The objective of this process is to identify the framework and context of a virtual accessible educational project, as well as its planning.

Conception/Design (CD):

With this process it is intended to define and design the teaching elements of a virtual accessible educational project.

Development/Production (DP):

The objective of the process is to produce the teaching elements of a virtual accessible educational project, according to the design produced.

Implementation (IM):

Its objective is to install and to activate the educational resources in a virtual accessible education platform.

Learning (LE):

During this process the teaching-learning is carried out using the established educational resources.

Evaluation/Optimization (EO):

It is a transversal process, in which all the necessary activities are included to make the evaluation and quality assurance of each one of the previous processes involved in a virtual accessible educational project.

The information model is used for the description of the processes, activities and tasks, as an index card, established by ISO/IEC 19796-1 standard, which considers a total of 13 information fields or meta data to completely define a process or sub-process (ISO, 2005). Those are the fields indicated in table 1.1

FIELD	DESCRIPTION
01. Identifier	Unique identifier of the process, activity or task.
02. Category	Main process to which it belongs: AN, AM, CD, DP, IM, PA o EO.
03. Name	Name of the process, activity or task.
04. Description	Short description of the process, activity or task.
05. Relations	Relation with other processes, activities or tasks.
06. Subprocesses	If it is about a process: Activities in which the process is divided. If it is about an activity: Tasks in which the activity is divided.
07. Objective	Main objective of the process, activity or task
08. Méthod	In the case of processes and activities: summary of the methodology to be applied when carrying out the process or activity. In the case of tasks: name of the techniques, methods or instruments that must be applied in the execution of the task, which will be described in cards with ISO/IEC 19796-3 format.
09. Result	In the case of processes and activities: Summary of the products to be obtained as a result of the execution of the process. In the case of tasks: list of products that should be obtained when executing the task.
10. Actors	In the case of processes and activities: summary of the profiles of the participants, who should take part in the execution of the process or activity. In the case of tasks: name of the profiles of the participants who should be part of the execution of the task, who should be described in cards with an established format for generic profiles of participants.
11. Measures/Criteria	In the case of processes and activities: summary of the metrics or quality criteria that should be evaluated to control the correct execution of the process or activity. In the case of tasks: name of the metrics or quality criteria that should be evaluated to control the correct execution of the task, and which will be described in cards with ISO/IEC 19796-3 format.

12. Guidelines	Broadly known guidelines, standards or recommendations, in which the process, activity or task is based.
13. Note/Example	Comments to clarify some aspect that was not discussed in the previous fields. Examples and experiences about the process, activity or task. The examples can be described or some link or reference to find examples can be provided.

Table 1.1. Fields to describe a process, activity or task according to ISO/IEC 19796-1 standard.

In the methodology, the activities in which each process divides have been established. ISO/IEC 19796-1 standard, used as reference, only establishes the categories of the processes to be considered and does not define its division, although the standard does include possible reference examples that have been taken into account in the proposal of division presented in this guide.

The activities that have been considered for each process are the ones presented in table 1.2. 32 activities have been defined, with a number between three to six activities for each process.

Each of the activities defined to make each process have been divided into tasks, with a number between two to seven, as it is shown in tables 1.3. to 1.9. For each task, the results to be obtained, the techniques to be applied, the metrics or quality criteria that will allow the verification of the correct execution of the task have been defined, as well as the profiles of the participants that are involved in the accomplishment of the task.´

The details of this information for each task are shown in chapters 2 to 8 of this guide, in which the activities and tasks involved in the accomplishment of each of the seven main processes of a virtual accessible educational project are presented.

PROCESS	ACTIVITIES IN WHICH THE PROCESS IS DIVIDED
AN. Needs Analysis	AN1. Demand analysis AN2. Identification of actors AN3. Goal setting
AM. Framework Analysis	AM1. External context analysis AM2. Internal context analysis AM3. Analysis of the target group AM4 Temporary and budget planning
CD. Conception/Design	CD1. Definition of educational objectives and contents from the detected needs. CD2. Definition of techniques, teaching model and inclusive methodology. CD3. Definition of the organization and technical requirements that guarantee accessibility and inclusion. CD4. Design of the accessible multimedia resources and accessible communication systems. CD5. Design of tests for inclusive evaluations CD6. Definition of the maintenance functions
DP. Development/Production	DP1. Production planning DP2. Accessible detailed design DP3. Realization/Modification of the accessible multimedia resources DP4. Realization/Modification of the accessible teaching software DP5. Reutilization/adaptation of pre-existing material DP6. Integration and tests
IM. Implementation	IM1. Installation and activation of the educational resources in the learning platform. IM2. Organization of technical and user support
PA. Learning	PA1. Admission management PA2. Registration of preferences, adaptation of lthe earning platform and initial instruction PA3. Execution of inclusive virtual education and accessibility treatment PA4. Inclusive evaluation
EO. Evaluation/Optimization	EO1. Planning of evaluation and optimization EO2. Collection of information EO3. Analysis of the obtained information EO4. Optimization

Table 1.2. Division of the processes in activities

ACTIVITY	TASKS IN WHICH THE ACTIVITY IS DIVIDED
AN1. Demand analysis	AN1.1 To identify demands and requirements AN1.2 To define the class of demand of the qualification
AN2. Identification of actors	AN2.1 To identify the profiles of the academic, technical and administrative staff AN2.2 To identify the interested parties AN2.3 To identify the profiles of students that have the different types of needs.
AN3. Goal setting	AN3.1 To formulate strategic objectives AN3.2 To formulate tactical objectives AN3.3 To formulate operative objectives

Table 1.3. Division of the activities of the Needs Analysis process(NA)

ACTIVITY	TASKS IN WHICH THE ACTIVITY IS DIVIDED
AM1. Analysis of external context	AM1.1 To analyze the conditions according to the regulatory framework in the politic-educational ambit AM1.2 To analyze the economic and social conditions
AM2. Analysis of internal context	AM2.1 To analyze the business model and the organizational and institutional structure AM2.2 To analyze the competences/qualifications and availability of the template resources AM2.3 To analyze the technical resources available and the infrastructure conditions and existing obstacles
AM3. Analysis of the target group	AM3.1 To analyze the socio-cultural and demographic factors of the target group of students AM3.2 To analyze the skills, qualifications and previous competences required from the students AM3.3 To define an information model to express the needs and preferences of the student
AM4. Temporary and budget planning	AM4.1 To elaborate the temporary planning with the evaluation and adaptation cycles that are required AM4.2 To elaborate the budget planning AM4.3 To establish the contractual restrictions

Table 1.4. Division of the activities of the Framework Analysis process (AM)

ACTIVITY	TASKS IN WHICH THE ACTIVITY IS DIVIDED
CD1. Definition of educational objectives and contents from the detected needs	CD1.1 To define the accessible teaching guides CD1.2 To formulate the objectives CD1.3 To define the competences to be obtained by the student CD1.4 To identify the topics/subjects
CD2. Definition of techniques, teaching model and inclusive methodology	CD2.1 To define teaching models that guarantee the accessibility and inclusion CD2.2 To establish the settings for inclusive learning CD2.3 To identify the activities to be made
CD3. Definition of the organization and technical requirements that guarantee the accessibility and inclusion	CD3.1 To define the role, tasks, responsibilities and rights of the actors in the inclusive educational setting CD3.2 To define the place and time for learning CD3.3 To identify the mandatory and optional technical requirements
CD4. Design of accessible multimedia resources and communication systems Accesibles	CD4.1 To select and to describe the aspects of the multimedia resources (web, video, audio...) and accessible communication systems to be used in the inclusive educational process CD4.2 To select and to describe the tutors, moderators and instructors of the student
CD5. Design of inclusive evaluation tests	CD5.1 To specify the evaluation tests to be made CD5.2 To validate the evaluation tests that were designed
CD6. Definition of maintenance functions	CD6.1 To define the procedure to carry out the teaching and methodological updates that assure the stability of the accessibility and inclusion CD6.2 To define the procedure to carry out the updates of contents that assure the stability of the accessibility and inclusion CD6.3 To define the procedure for the technical maintenance that assures the stability of the accessibility

Table 1.5 Division of the activities of the Conception/Design process (CD)

ACTIVITY	TASKS IN WHICH THE ACTIVITY IS DIVIDED
DP1. Planning of the production	DP1.1 To divide the production work of accessible contents DP1.2 Plan the production
DP2. Detailed accessible design	DP2.1 To make the detailed accessible design of the multimedia resources DP2.2 To design the interactions
DP3. Elaboration/Modification of the accessible multimedia resources	DP3.1 To produce accessible multimedia resources DP3.2 To test the accessible multimedia resources
DP4. Elaboration/Modification of the accessible teaching software	DP4.1 To develop the accessible teaching software DP4.2 To test the accessible teaching software
DP5. Reuse/adaptation of pre-existing material	DP5.1 To make a revision of existing material and determine if it can be adopted or redesigned DP5.2 To conduct actions for the reuse, re-purpose and adaptation of pre-existing materials
DP6. Integration and tests	DP6.1 Integration of multimedia resources, software and reused material DP6.2 Integration and functional tests

Table 1.6.Division of activities of the Development/Production Process (DP)

ACTIVITY	TASKS IN WHICH THE ACTIVITY IS DIVIDED
IM1. Installation and activation of the educational resources in the Learning platform	IM1.1 To prepare the Learning platform (LMS) IM1.2 To integrate educational resources and teaching design IM1.3 To carry out tests in the learning setting
IM2. Organization of technical and user support	IM2.1 To organize the technical support IM2.2 Organize the support to users

Table 1.7. Division of activities of the Implementation process (IM)

ACTIVITY	TASKS IN WHICH THE ACTIVITY IS DIVIDED
PA1. Admission management	PA1.1 To obtain information about the student and his needs of interaction PA1.2 Invoicing/accountability management PA1.3 To provide the student with the organizational PARTS that ease the learning
PA2. Register of preferences, adaptation of the learning platform and initial instruction	PA2.1 To communicate the institutional services that the University gives the student community PA2.2 To register the needs and preferences of the student and to adapt the learning platform PA2.3 To instruct the users in virtual environments of accessible Learning and in the use of the support technologies
PA3. Execution of inclusive virtual education and accessibility treatment	PA3.1 To implement the pedagogic, didactic, methodological and technical support PA3.2 To execute the teaching profession according to the pedagogical model and preferences
PA4. Inclusive evaluation	PA4.1 To evaluate the Learning and transference of knowledge PA4.2 To manage the results of the students

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Table 1.8. Division of the activities of the Learning process (LP)

ACTIVITY	TASKS IN WHICH THE ACTIVITY IS DIVIDED
EO1. Planning of the evaluation and optimization	EO1.1. To define the life cycle of the educational project in relation to the evaluation (type of cycle of design-production-implementation-evaluation) EO1.2 To define the objectives of the evaluation (What for) EO1.3 To identify the aspects to be evaluated (What) EO1.4 To establish the temporary framework (When) EO1.5 To identify the evaluators (Who) EO1.6 To build instruments and to define internal and external evaluation criteria (How) collection of information
EO2. Information collection	EO2.1 To organize the collection of information EO2.2 To collect information about the processes in the Needs Analysis (NA) and Framework Analysis (FA) EO2.3 To collect information about the Conception and Design Process (CD) EO2.4 To collect information about the Development/Production Process (DP) EO2.5 To collect information about the Implementation Process (IM) EO2.6 To collect information about the Learning Process (LE) EO2.7 To validate the collected information
EO3. Analysis of the obtained information	EO3.1 To analyze and elaborate reports per process EO3.2 To analyze and elaborate a global report EO3.3 To elaborate external reports (optional)
EO4. Optimización	EO4.1 To contrast the reports about external and internal evaluation (optional) EO4.1 To elaborate final conclusions and an improvement plan EO4.3 To communicate the results and recommendations

Table 1.9. Division of the activities of the Development/Production process (DP)

As it was shown in picture 1.1, in this methodological guide the parts that should be considered at the time of making a virtual accessible educational project are established.

For a set of standard procedures for the processes, it has been decided to establish such parts as a task. The methodology describes four types of parts: the products, techniques, metrics and involved participants in each task.

Generally, a process can be taken as the transformation of an input to obtain an output.

In the case of the processes involved in an educational project, this is no different; namely, each of the defined processes must obtain some results as from some input. In the case of the initial processes, the input will be the information about the demand of education, as well as the non-evident input, as motivation or the desire to set an educational program in motion, and others like the previous existing barriers and the needs to guarantee inclusion.

In the methodology, the seven main processes in activities have been divided and then those in tasks, but activities and tasks are processes too, considered in this context as sub-processes of other processes.

Therefore, in the case of the main processes, the results that will be obtained as a consequence of its making will be the sum of the results obtained in each one of the activities in which a process is divided. And in the same way, the results of the activities will be the set of results of the tasks in which each activity is divided.

According to the previous reasoning, it is enough with describing the products or results of each of the tasks, and that has been made in this methodological guide, indicating in chapters 2 to 8 the detail of the products that should be obtained in each of the tasks of the activities in each stage of a virtual accessible educational project.

To get the established products for each task of an educational project, it is necessary to apply techniques, instruments or methods; using these three concepts indistinctly in this guide. These techniques can be different in each institution, and will be selected correctly if with them the established product for the task they are associated with is attained.

There are many possible techniques to attain the same objective. In this guide we recommend techniques to apply in each of the tasks of a virtual accessible educational project. In the chapters of the guide, only the name of each proposed technique will be available, being able to consult the annexes in electronic format to find the definition of each technique.

For the description of techniques or methods, the information model has been used, as an index card, established by ISO/IEC 19796-3 standard, which considers a total of 17 information fields or meta data, to completely define a technique (ISO, 2009).

They are the fields indicated in table 1.10.

FIELD	DESCRIPTION
01. Identifier	Unique identifier of the process, activity or task.
02. Name	Name of the process, activity or task.
03. Objective	Main objective of the process, activity or task
04. Description	Short description of the technique or method/ Some link or reference must be specified where a more detailed description can be found

05. Type of use	Optional field. If a technique or method has more than one possible use, the one applied for this case must be specified
06. Source	Optional field. Origin of the technique or method. It is recommendable to indicate some link or reference where this information can be found
07. Rights	Optional field. Information about possible license of use of the technique or method
08. Reach	Optional field. It must be indicated which quality characteristics are assured or improved by the use of the technique or method
09. Context	Optional field. Conditions for the use of the technique or method.
10. Type	Optional field. Category of the technique or method, necessary instruments or resources to apply
11. Área of application	If the technique or method has an application in a related area with organization, project, process, product. etc.
12. Process	Process or stage of life cycle of an educational project, in which the technique or method is applied
13. Actors	Profiles of participants in an educational Project, who are implicated in the application of the technique or method.
14. Relations	Optional field. Relation with other activities or methods.
15. Standards	Optional field. Broadly known guidelines, standards or recommendations, in which the process, activity or task is based.
16. Notes	Optional field. Comments to clarify some aspect that was not discussed in the previous fields.
17. Examples	Examples and experiences of use with the technique or method. The examples can be described or a link or reference to find examples can be indicated.

Table 1.10. Fields to describe a technique or method according to ISO/IEC 19796-3 standard

With the purpose of controlling if the established products or results for each task are being obtained in a correct manner, in other words, if the technique is being applied correctly, metrics or quality criteria have been defined.

As it happened with the techniques, ISO/IEC 19796-3 standard also indicates which fields must be considered to completely describe a quality metric (ISO, 2009). In this case it is about the 12 fields that appear in table 1.11.

FIELD	DESCRIPTION
01. Identifier	Unique identifier of the metric.
02. Name	Name or title of the metric.
03. Objective	Objective of the metric.
04. Source	Optional field. Origin of the metric. It is recommended to indicate some link or reference where to find this information.
05. Description	Short description of the metric. Some link or reference where to find a more detailed description must be indicated.
06. Rights	Optional field. Information about possible license of the metric.
07. Reach	Optional field. Which characteristics of quality are assured or improved by the use of the metric or criteria must be indicated.
08. Type	Characteristics for the calculus or processing of the metric. It is divided in five sub-fields.
08.1 Category	Classification of the metric in a category as average metric type, ratio, categorization, descriptive, ranking, true/false, etc.
08.2 Calculation	Optional field. Form of determining the metric value.
08.3 Scale type	Type of scale for representing the value of the metric, as for example, nominal, ordinal, interval, ratio, absolute, etc.
08.4 Criteria	Optional field. Metric value reference, as for example, ideal value, average recommended value, etc.
08.5 Resources	Optional field. Necessary resources to determine the value of the metric.
09. Period	Optional field. Period of use of the metric, moment and frequency to determine the value of the metric.
10. Actors	Optional field. Profiles of participants involved in an educational project about calculating and using the metric.
11. Notes	Optional field. Comments to clarify some aspect that does not appear in the previous fields.
12. Examples	Examples and experiences on using the metric. The examples can be described or some link or reference where to find examples can be indicated.

Table 1.11. Fields to describe a metric or quality criteria according to ISO/IEC 19796-3 standard

To implement the methodology described in this guide, the involvement of participants in each of the tasks in which a virtual accessible educational project is divided is necessary. Each participant will have a specific mission in each task, and in many cases one participant will collaborate in many tasks. There are studies that can help to identify the profiles of these actors, as the work of Rodriguez-Ascaso et al. (2011), in which users and implied services in the development of an accessible university are described.

With the purpose of determining the most adequate profile from the participants, cards in which said profiles are described have been elaborated. Table 1.12 shows the 6 information fields that each participant involved in the tasks in the methodology should describe.

FIELD	DESCRIPTION
01. Identifier	Unique identifier of the profile of the participant.

02. Name	Name or title of the profile of the participant.
03. Description	Short description of the profile of the participant. Some link or reference where to find a more detailed description must be indicated.
04. Competences	Competences and abilities that the participant must have. As far as possible, we would try to merge them with standard competences or ones that are acknowledged by the pertinent authorities.
05 Sources	This field is destined to offer links or references to information about possible training programs in which a person can get some or all of the competences associated with the profile of the participant.
06. Notes	Comments to clarify some aspect that does not appear in the previous fields. This field can be used to inform the different ways to obtain the competences required to the profile of the participant.

Table 1.12. Fields to describe a profile of a participant in an educational Project.

The purpose of the guide presented in this book is to be useful and be a model for the development and application of accessible virtual educational actions on behalf of educational institutions or, in general, on behalf of any supplier of virtual education.

It is expected that the academic staff uses this guide, as well as the directives and administration staff and services involved, and also the administrators of virtual education platforms and the creators of virtual contents.

1.2.5.1. IMPLEMENTATION OF THE LIFE CYCLE FOR A VIRTUAL ACCESSIBLE EDUCATIONAL PROJECT

As a previous step before a virtual accessible educational project, the life cycle that will be adopted in the project has to be determined, that is to say, the steps of the processes, activities and tasks. This guide has a life cycle framework model, that must be particularized in each project, also defining clearly the relation of the evaluation with the rest of the processes in the project. Basically, it is about deciding the type of design-production-implementation-evaluation cycle that is going to be applied.

Next are some examples that can serve as orientation when deciding how to order the processes. These examples do not consider the order of the activities that are part of each process. In the following chapters of the guide, the order that seems more logical for the activities integrated in each one of the processes is proposed. The educational institution must be the one who decides if it keeps the proposed order or decides a different one.

> **Iterative life cycle by editions:** It is about the most common life cycle, where there are complete repetitions for each edition of a virtual course, from the Needs Analysis Process (AN) to the "Learning" Process (PA), and once the edition of the virtual course set going is finalized, it proceeds to the evaluation of the activities held, and its results will be taken into account in the following edition of the course (picture 1.3). In this life cycle, it is established that a process does not begin until the previous process is over. As it can be necessary to make adjustments in the previous processes, the existence of dashed lines that show this possible reverse or retroaction can be observed in the diagram.
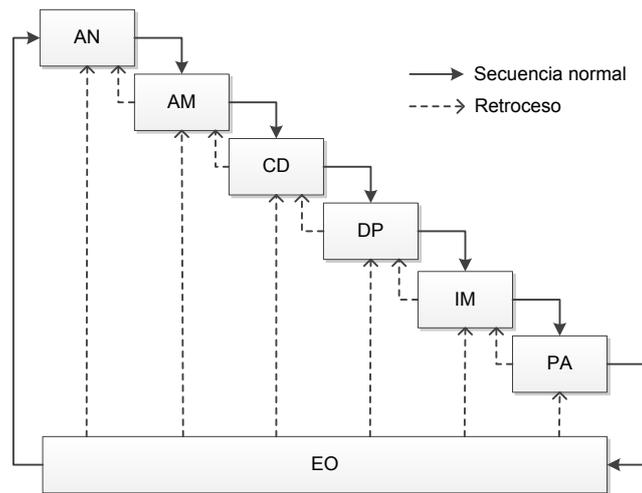
Picture 1.3. Iterative life cycle by editions

This life cycle is recommended to be used when a new virtual educational project is started and it is necessary to begin by investigating the educational needs in the context, to continue with the proposal, and then with the evaluation. It can also be taken into account when an on-campus program course wants to be changed to a virtual program, as it always needs to start with an exploration of the educational needs to be able to move forward to the next processes.

Iterative life cycle with a shared analysis between editions: It is appropriate when it is decided that the needs and framework analysis of a course will be made one single time, and the modification in the design and the rest of the processes is just proposed in the following editions thereof (picture 1.4).
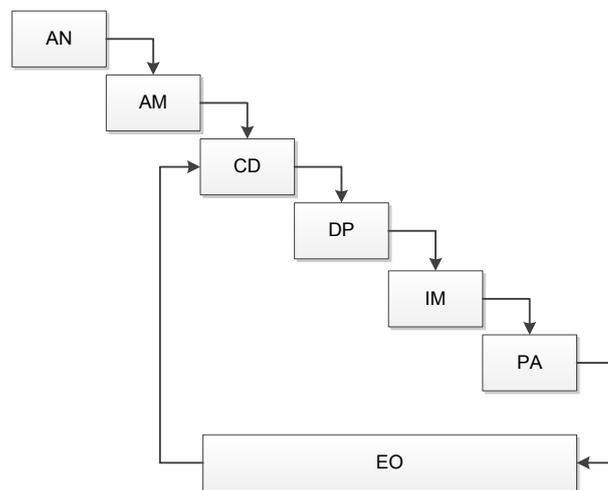
Picture 1.4. Iterative life cycle with a shared analysis
(for simplicity, the reverse lines are not shown)

This life cycle is ideal to use when one already has the first version of a virtual accessible course and wishes to propose more editions, were the evaluation that was made helps to produce that improvement input to be implemented in the next edition, being it an unending cycle. Even if the research of the needs is made only once, it is recommended, a few years later, to perform all the starting processes again, as the technologic advancements and

methodologies evolve in the course of time, which is why we do not want an outdated course or one that does not comply with the needs detected before.

Iterative life cycle with analysis and shared design among editions: It considers the analysis and design of a course is made only once, and the modification in the production of the contents is only proposed in the following editions thereof (picture 1.5).
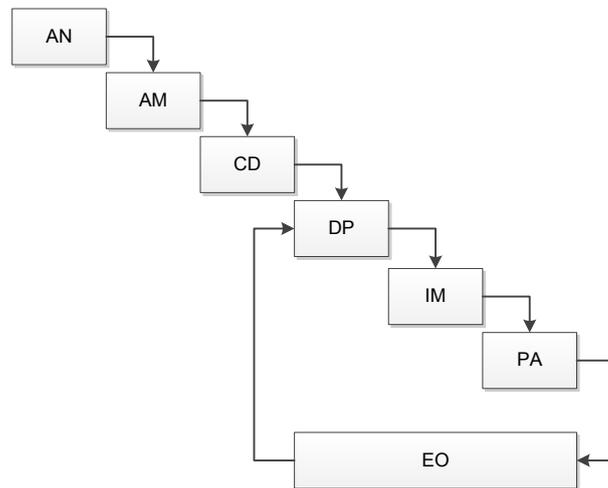
Picture 1.5. Iterative life cycle with analysis and shared design
(for simplicity, the reverse lines are not shown)

This cycle is suggested to be used when the course and its instructional design is already elaborated, but in which it is only needed to have the update of the contents, tools or resources of the educational proposal.

Iterative incremental life cycle with a one-time instruction: When the contents of the course are divided in modules that will be produced more or less independently, in such a way that only when they are finished, the course will be imparted (picture 1.6).
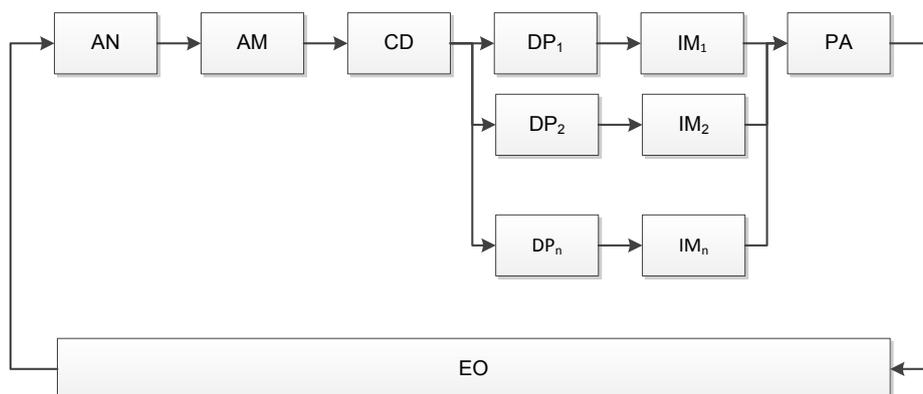
Picture 1.6. Iterative life cycle with a one-time instruction
(for simplicity, the reverse lines are not shown)

Iterative incremental life cycle with a step by step instruction: In this life cycle, it is considered that the course must be analyzed completely, but it is done step by step,

designing, producing and imparting each part more or less separately from the other (picture 1.7).
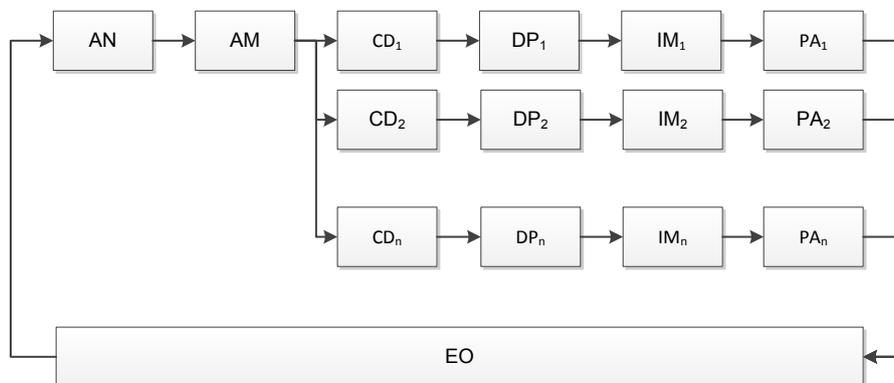
Picture 1.7. Iterative incremental life cycle with a step by step instruction
(for simplicity, the reverse lines are not shown)

This life cycle, unlike the previous one, can be used when a more complex educational proposal is presented, as workshops, degrees, certifications, bachelor's degree, master's degree or any curriculum project were many courses are involved. That is why, in practice, the educational needs are the ones needed to be detected, and the framework analysis is made only once, as from them a more complex curriculum proposal will be constructed, in which the following processes will be applied independently.

The previous paragraph has some examples of life cycles that can be established, but many others can be proposed, even life cycles that consider more than one dimension. An example could be a two-dimensional life cycle, similar to the known united life cycle, which is used in software production projects (Jacobson et al., 2000), and considers that the working stress related with analysis, design, etc., not only dedicates to the phase or process of the same name, but other processes can also dedicate time for the tasks that from the start seem to be for other process. The aspect of this life cycle is different to the previous ones, as the working stress dimensions and the temporary dimension of the processes must be combined.

The following subsection has some frequently asked questions (FAQ) that an user of this guide could have. Other questions that could come up after the printed edition of the book will be shared in the web site dedicated to the methodology (www.esvial.org/guia).

a) Who needs to use the guide?

In general, the users of the guide will be persons who have the profiles of participants that should be the ones involved in the different activities and tasks of an accessible virtual education, who are mentioned in the following chapters of the guide. They are teachers, academic managers, administrators of virtual campus, experts in accessibility, content editors, evaluators, etc. In general, they are all the persons involved in the development of an accessible virtual education.

In relation to the teachers, this is a methodology for an accessible virtual education, that is why for its adequate establishment, the teachers involved should have basic knowledge about the problems that a student with disability can find. However, at present few teachers know about these matters

and have no experience on applying them. It would be convenient to offer a basic training to the teachers that will be involved on imparting virtual educational programs, on how to develop an inclusive pedagogic design and how to prepare accessible educational contents.

Being this a guide for inclusive virtual education, it should also be accessible, as its users can also have disability; so the electronic version of the guide and the associated electronic resources, available in the web site www.esvial.org/guia, have been created to be accessible.

b) How to use this guide?

The guide should be the framework of reference for the planning, creation, teaching and evaluation of virtual accessible educational programs.

At the time of applying the guide, the institution (university, school, company or, any provider of virtual education in general), should follow the next steps:

1. To adapt the methodology to the institution. The institution can use other names, even a different number of processes, activities and tasks. But in this case it should identify clearly which tasks, activities and processes of the methodology are like their own, and be sure that it has implemented all the tasks established by the methodology, even if it was with other structure or name. The same should be done for the names of the profiles of participants established in the guide, which should connect to the existing profiles in the institution.
2. To establish its own format for the products (results) that in the guide are set to be generated in each task (documents, application, educational contents, etc.), taking into account the techniques that the guide recommends. The guide does not require particular formats. Some examples can be found in the web that gives assistance for the establishment of the formats www.esvial.org/guia.
3. To define a life cycle for the accessible virtual education format to be executed efficiently (in section 1.4.1 of the guide are some examples).
4. To execute the educational project, carrying out the tasks that are detailed in the guide, and applying the defined techniques and metrics. As the description of techniques and metrics (and also profiles of participants) can change, because they are linked to references or web pages that can change. The cards that describe those parts are not included in the printed version of this guide. The cards can be found in electronic format in the web of the methodology. Solve any doubt about how to apply the guide through the web site created to facilitate its establishment, where this book can also be found in electronic format: www.esvial.org/guia.

c) The processes (phases) defined by the guide must be carried out in sequence?

This is not necessary and it does not respond to the operative development thereof, which considers, through the evaluation and planning processes, the need for reconsidering designs and proceedings in terms of the results obtained. In picture 1.2 it appears arranged in sequence because that is a way of explaining which would be the logical order for its making. To start with the next process, the previous one does not need to be finished completely. The order for making each educational project has to be set by the institution, through the definition of a life cycle for the project and its academic experience.

d) The activities for a process need to be executed in the order indicated by the methodology?

In the guide, the activities in which each process divides are defined and a graphic with the recommended order to execute them is shown. But an institution can change the order of execution thereof, and the results to be obtained are the same.

e) The students with and without a disability must be apart?

No. This is a methodology for an accessible virtual education for everyone, thence, it is inclusive. For that reason, when in the guide says "student", it must be considered that the student can have a physical or sensorial disability, or not

This is a methodology for an inclusive education, based on the principles of the universal design or design for all. Every task in which disability may be a difficulty to achieve it, has considered integrated solutions to prevent that a student with disability is unable to do it. For example, activity "PA4, Inclusive education" is about evaluating all students, even if they have a disability or not. Therefore, there should be different ways to take an exam, for example, to have the possibility of answering the questions by writing the answer or by recording the answer.

f) Who carries out the processes described in the methodology?

The methodology establishes the profiles of the participants that should be involved in each of the tasks that are part of each process. But it is important to highlight that all the processes in the methodology should be developed by persons that have the competences required for them, independently if it is for a person with or without a disability and, therefore, the institution has to have tools and resources that generate accessibility.

g) Is it obligatory to use the techniques established in the methodology?

No, if the other technique that is used has the same objective. For example, the guide mentions a technique named "information needs and personal preferences model". An institution can adopt the information fields that the ISO/IEC 24751-2 standard establishes for it, while other institution can define its own fields, and in both cases the methodology is being followed, as it is collecting information about the preferences of the students, which is what is important.

h) A "virtual education platform" is a LMS (Learning Management System)?

In the guide, the term "education platform" is used to refer to the collection of computing tools that are of support for virtual education, that is to say, to the software being used fot the display of educational contents, and to enable the activities of evaluation, tutoring, communication, follow-up, etc, expected in an educational action (AENOR, 2012). This term is used as a synonym of the term

LMS (Language Management System). Although in the last years that concept is being surpassed by others like "Learning architecture" or "Open environment", in which LMS is integrated with many other available on-line elements, from social networks, wikis, all types of store places (Dagger et al., 2007). In the guide that term is kept because it is the one people know more.

i) What requirements must a virtual education platform (LMS) comply with?

To be able to apply the guide, it is necessary to use accessible platforms when teaching. In chapter 9, the basic requirements that an LMS must comply with to be accessible are described.

j) To use the methodology proposed by the guide, one must have experience in e-learning or virtual education?

ideally, it is required that the person or group of persons that will elaborate a course or accessible and inclusive virtual educational project must have some knowledge or previous experience in virtual education, as the guide uses guidelines and technical language that is necessary for the development of a virtual educational project, which is both accessible and inclusive.

k) When is it suitable to use this guide?

It is recommended to use the processes that this guide presents from the moment a virtual educational project is made (e-learning), as it will ease the development of its accessibility and inclusion, starting from the life cycle that was chosen for the construction of the educational proposal.

For the educational institutions it will be important to take into account the intervention of experts that can collaborate with the construction and implementation of the project, among its work group and budget, being them part of the institution, who will receive training, or to hire new professionals who have the necessary competences for its development.

l) What is the difference between a virtual course and an inclusive one?

A virtual course is the process of distance Learning education offered through the Internet, which keeps a synchronous and asynchronous communication through an educational portal and other virtual media. An inclusive virtual course is nothing more than the same, but with a new focus: it allows the entrance to diversity, which means that any person with or without a disability can have the opportunity to receive an education on an equal basis. Sure enough, for that to happen there has to be processes and activities which allow so, and that is the reason why this guide was created.

m) Why is it important to take accessibility into account in a virtual course?

Accessibility allows the use of all didactic materials or reading for all the participants in the course, enabling the entrance of potential users and generating greater opportunities of education and growth among the population.

n) What benefits are obtained from creating virtual inclusive courses?

There are many benefits when creating virtual inclusive courses, and here we will mention a few of the most important ones:

1. To take care of the educational need that exists between a context, taking into account the diversity of students that can be interested in the educational programs that the institution offers.

2. To create new educational spaces that cover the Learning need in a virtual context.

3. To give the opportunity of education and updating to people with disability, as it will give them better opportunities in life.

4. To redefine the curricular programs in favor of inclusion, as a starting point for the improvement and quality in virtual education that the institution can offer.

5. To proclaim equal rights to education inside the educational context where the institution is, being this the framework for other institutions to copy what has been experienced and, in that way, be agents of positive change in the educational environment.

2. *Needs Analysis Process (AN)*

2.1. INTRODUCTION

Needs Analysis comes from the concept of curricular theories, which refers to the definition of the lack of learning in the environment (educational organization or institution), of the persons (potential students) and the content.

The evaluation of needs can use many methods for the compilation of data, with a representative sample, that allows to obtain the necessary input material for the proposal of a virtual inclusive educational project.

So the objective of the Needs Analysis Process (AN) is to identify and to describe the requirements, demands and restrictions of a virtual inclusive educational project.

This process carries out activities classified for analyzing the characteristics of the educational demand of the target population, with special attention to those participants with disability, to which the educational project is directed and to what the context is identified and defined, and the needs, requirements and demands for their development. This will allow the identification of needs, requirements and goals of the project that wants to be implemented.

It is important to highlight that the Needs Analysis Process must have the user (student) as center of attention to whom the education is directed. This focus centred on the user must be maintained in the course of the rest of processes that constitute the educational project, assuming yhe philosophy of development and design centred in the user that came up in the eighties in the XX century, first as a generic focus by authors in the psychology environment like D. Norman (2002), but which has been strengthening in the information technologies environment in relation to the creation of interactive products, which has made room for prominent international standards on ergonomics, among them, ISO 9241 series, in methodologies (Poulson et al., 1996) and in specific recommendations about design focused on the user in web sites (US, 2012; W3C, 2004).

In terms of defining an open curriculum centered in the student, two types of needs are distinguised: the objetive and the subjective ones. The objective needs come from the social, cultural and educational conditions of the students, oriented to the product that is going to be obtained from the learning, with the intervention of an expert or group of experts before putting the course or project into motion. The subjective needs are related with the factors that have an influence in the learning, as the personal, affective and cognitive factors of the group of students. These type of subjective needs are oriented to the Learning Process, so that is why it is important to consider the opinion of the teachers in charge of the course, of the students involved and of some organizations that may support the teaching of people with disability.

In the Needs Analysis Process there is also an identification of the human resources required for the development and follow-up of the educational project. The teachers and the technicians and administrators required in the project are included in these human resources. With this, a clear view of the interested actors is obtained, their needs and the resources, as well as getting a clear view on the potential market and potential partners.

Finally, this process includes the definition of objectives in the educational project that wants to be created, the strategic objectives as well as the tactical and operational ones that the educational institution wants to offer to satisfy the requirements of the population that the project is directed to.

2.2.   ACTIVITIES

The AN process divides in the three following activities:

- AN.1 Demand analysis

- AN.2 Identification of actors

- AN.3 Goal setting

In figure 2.1 the logical order of execution of these activities is shown. Activities AN.1 and AN.2 could be executed simultaneously, while activity AN.3. should begin once the two previous ones are finished.

In table 2.2 there is a brief summary of the goals of these activities.

Picture 2.1. Logical order of execution of the activities in the Needs Analysis Process (AN)

ACTIVITY	DESCRIPTION
AN1. Demand analysis	The requirements to supply the demand of specific populations identified through a relation of market segments to which the educational action is directed to is identified in this activity. The situation of the vulnerable population is described, especially the population with disability that will be the object of the intervention. The qualities that respond to the demand are defined, taking into account the framework of the recognized degrees in the context were the educational action will be developed.
AN2. Identification of actors	In this activity the academic, administrative and technical staff is identified, they will have the task of materializing the demand and offered qualification in a proposed educational action, feasible to be implemented

	in this context. And also the managers or persons in charge of the educational action. As well, the interested parties that may be strategical and operative allies are identified, for example, NGO, community associations, professional associations, governmental institutions and others in the surroundings. The activity ends with the identification of students, which results in the elaboration of the profiles of groups of possible users, giving priority to those who belong to populations with disability, considering the greatest part of the existing typology.
AN3. Goal setting	Here it is intended to concretize the collected information in the previous activities to create the strategic, technical and operative objectives that the educational institution wants to obtain to answer the demand identified in the context of a specific population. The relation among the types of objectives is important to define the actions to be made in the following processes, the Framework Analysis (AM) and the Conception/Desing (CD).

Table 2.1. Logical order of execution of the activities in the Needs Analysis Process (AN)

2.3. TASKS

The tasks in which the AN process divides are the ones shown in table 2.2.

ACTIVITY	TASKS IN WHICH THE ACTIVITY IS DIVIDED
AN1. Demand analysis	AN1.1. To identify demands and requirements AN1.2. To define the class of demand of the qualification
AN2. Identification of actors	AN2.1. To identify the academic, technical and administrative staff AN2.2. To identify interested parties. AN2.3. To identify the students
AN3. Goal setting	AN3.1. To formulate strategic objectives AN3.2. To formulate technical objectives AN3.3. To formulate operative objectives

Table 2.2. Logical order of execution of the activities in the Needs Analysis Process (AN)

This proposal is complemented with a web page in www.esvial.org/guia, including an interactive list with each activity, detailing the tasks in which they divide; and for each task, (1) the results to be obtained at the end of its execution; (2) the techniques, methods or tools to apply; (3) the metrics or quality criteria to verify the correct execution of the task; and (4) the profile of the participants in the task. The system in the web page is complemented with a search engine for best reference.

3.   *Framework Analysis Process (AM)*

3.1.   INTRODUCTION

The objective of this process is to identify the framework and the context of a virtual accessible educational project. It is about keeping up with the analysis made in the previous process, but approximating it to the real environment in which the education will be held.

That is how the educational context is defined by a series of elements and factors that can benefit or difficult the teaching-learning process. That is why it is important to analyze the internal and external context to detect the strengths , opportunities, weaknesses and threats that the educational project can have at the moment of creating the educational and administrative strategies that are convenient to generate an inclusive virtual learning environment.

In other words, it is relevant to determine the type of citizens that we want to educate, taking into account the challenges and changes that currently exist in education and its context, delimiting the educational action that the institution will offer through the virtual educational project, which allows accessibility in its contents and the inclusion of people with or without a disability.

Virtual inclusive education is based on the respect and attention to the diversity of a population interested in updating and learning through an environment that will allow them to enter a teaching-learning process and in that way improve their own intellectual, sociocultural and economic conditions, and as a consequence have a better quality of life.

The institution needs to analyze the possible external restrictions, of legislative, economic or social type, that can condition the development of the educational program, and at the same time, evaluate the internal requirements relative to the organizational structure of the institution, the human, technological and financial resources that are necessary for the preparation, management and teaching of the project.

It is also important in this process, to exactly identify the target group of students to which the education is directed, and to determine factors of social, cultural or demographic nature that can be necessary to consider while preparing the inclusive educational program, as well as the previous competences that will be required from students.

As a conclusion of the analysis processes, a planning of the activities of the educational project must be elaborated once there is enough information about the virtual accessible educational program that wants to be established, it must consider the necessary time and resources to carry out the activities related to the instructional design, the production of educational contents, the teaching of the program, the continuous evaluation of all the processes, the collection of "lessons learned" and feedback to improve the following cycles of development.

3.2.   ACTIVITIES

The AM process divides in the four following activities:

- AM1. Analysis of external context

- AM2. Analysis of internal context

- AM3. Analysis of the target group

- AM4. Temporary and budget planning

In figure 3.1 the logical order of execution of these activities is shown. Activities AM.2 and AM.3 could be executed simultaneously, while activity AM.4. should begin once the two previous ones are finished.

In table 3.2 there is a brief summary of the goals of these activities.
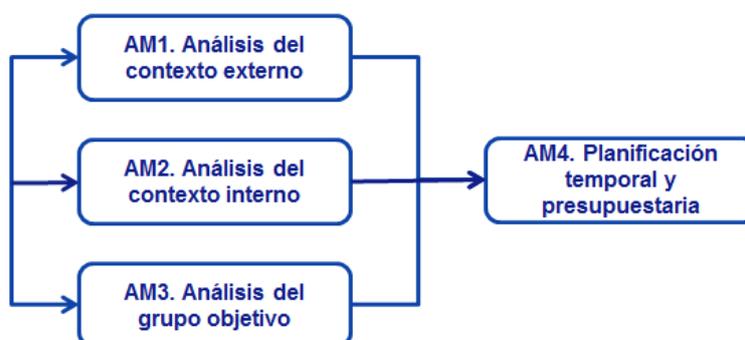
Picture 3.1. Logical order of execution of the activities in the Framework Analysis Process (AM)

ACTIVITY	DESCRIPTION
AM1. Analysis of external context	It is about analyzing the possible restrictions that are external to the institution, of legislative, economic or social type, availability in technological and communications infrastructure, etc, that could condition the development of the educational program.
AM2. Analysis of internal context	The internal requirements relative to the organizational structure of the institution must be established, and also the necessary resources for the preparation, management and teaching of the program, both of the staff and technological ones.
AM3. Analysis of the target group	The target group of students to which the education is directed needs to be identified, and to determine factors of social, cultural or demographic nature that can be necessary to consider while preparing the educational program, as well as the previous competences that will be required from students.
AM4. Temporary and budget planning	A planning of the activities of the educational project has to be elaborated, which consider the necessary time and resources to carry out the activities related to the instructional design, the production of educational contents, or the teaching of the program, compatible with the life cycle defined at the beginning of the project.

	With the goal of making a continuous evaluation of the project to improve the following development cycles, it is important to share in which moment the collection of information that the Evaluation/Optimization Process needs is going to happen.

Table 3.1. Brief description of the activities in the Framework Analysis Process (AM)

3.3. TASKS

The tasks in which the AM process divides are the ones shown in table 3.2.

ACTIVITY	TASKS IN WHICH THE ACTIVITY IS DIVIDED
AM1. Analysis of external context	AM1.1. To analyze the conditions according to the regulatory framework in the political-educational area AM1.2. To analyze the economic and social conditions
AM2. Analysis of internal context	AM2.1. To analyze the business model and the organizational and institutional structure. AM2.2. To analyze the competences/qualifications and availability of the template resources. AM.2.3 To analyze the available technical resources and the infrastructure conditions and existing obstacles.
AM3. Analysis of the target group	AM3.1. To analyze the sociocultural and demographic factors of the target group of students. AM3.2. To analyze the skills, qualifications and previous competences required from the students AM3.3. To define an information model to express the needs and preferences of the student
AM4. Temporary and budget planning	AM4.1. To elaborate the temporary planning with the evaluation and adaptation cycles that are required AM4.2 To elaborate the budget planning AM4.3.To establish the contractual restrictions

Table 3.2. Division of the activities in the Framework Analysis process (AM)

This proposal is complemented with a web page in www.esvial.org/guia, including an interactive list with each activity, detailing the tasks in which they divide; and for each task, (1) the results to be obtained at the end of its execution; (2) the techniques, methods or tools to apply; (3) the metrics or quality criteria to verify the correct execution of the task; and (4) the profile of the participants in the task. The system in the web page is complemented with a search engine for best reference.

4. Conception/Design Process (CD)

4.1.   INTRODUCTION

The objective of this process is to define and to design the didactic elements of a virtual inclusive educational project, which are structures through an instructional design model, which is defined by the educational institution. The instructional design concept can be defined as that which describes and specifies the relation that exists among the elements that give form to the educational action developed in the virtual environments, were there must be a good use of the technology and multimedia resources in the teaching-learning process.

In other words, it is the planning and structuring of the contents of a virtual course according to the needs of the students, with the end of considering the aspects that will allow accessibility, usability and inclusion in virtual education.

In the implementation, the guide proposes the first phase is complemented by the analysis made in the two previous processes, AN and AM process, so then the organization of the other phases of the process can follow, getting deeper into the development, implementation and evaluation in the four last processes of this guide, being them the DP, IM, PA and EO processes.

As part of this process, the different actors that can participate in the educational process have to be defined, identifying their roles, tasks and responsibilities thereof, as well as the work flow of the activities to be made.

Then, the design of the contents, of the multimedia educational resources and of the necessary communication systems will be established for the implementation of an inclusive teaching-learning process, compiled in a Teacher's Guide and its respective Didactic Units.

The design of the contents must include the high level development of the multimedia educational resources and of the necessary communication systems for the implementation of the expected didactic method. This development will not be detailed and, as far as possible, independently from the technology to be used, as in the next process, Development/Production (DP), the accessibility and usability of the didactic contents of the project will be made.

Finally, the necessary activities and evaluations should be considered to confirm the learning process of the student when he receives the accessible virtual course, so the most important elements to be considered will be revised for their correct implementation.

4.2.   ACTIVITIES

The CO process divides in the six following activities:

- CD1. Goal setting and educational contents from the detected needs.

- CD2. Definition of techniques, didactic model and inclusive methodology

- CD3. Definition of the organization and technical requirements which guarantee accessibility and inclusion

- CD4. Design of the accessible multimedia resources and accessible communication systems

- CD5. Design of inclusive evaluation tests

- CD6. Definition of the maintenance functions

In figure 4.1 the logical order of execution of these activities is shown. Activities CD3 to CD5 could be executed simultaneously, once activities CD1 and CD2 are finished, while activity CD6. should begin once the previous ones are finished.

In table 4.2 there is a brief summary of the goals of these activities.

Picture 4.1. Logical order of execution of the activities in the Conception/Design Process (CD)

ACTIVITY	DESCRIPTION

CD1. Goal setting and educational contents from the detected needs.	This activity consists mainly on the formulation of the teaching objectives and the scheme of contents of the virtual educational action being designed. And all of that is integrated in an inclusive teaching guide.
CD2. Definition of techniques, didactic model and inclusive methodology	It is about defining the didactic models, the activities to be made during teaching, guides and work flows during the development of the course, always applying universal accessibility principles and inclusive education, and its integration to the teaching guide.
CD3. Definition of the organization and technical requirements which guarantee accessibility and inclusion	This activity has as objective to identify the roles, tasks and responsibility of the actors, as well as the definition of the place and calendar for the educational process, also including the definition of requirements of the tools (software included) to carry out the process.
CD4. Design of the accessible multimedia resources and accessible communication systems	The objective of this activity is the making of a high level functional activity of the educational resources and communication systems to be used, as well as the relation of competences required by the different actors in the educational process.
CD5. Design of inclusive evaluation tests	The evaluation tests that should be made in the course should be designed, identifying the type, moment and form of evaluation therefore. The method of evaluation must be inclusive and accessible.
CD6. Definition of the maintenance functions	The activity has as objective to define the procedures that are relative to the maintenance and update of the course, especially in what refers to the conceptual design of the contents and resources, and also to the instructional design.

Table 4.1. Logical order of execution of the activities in the Conception/Design Process (CD)

4.3. TASKS

The tasks in which the CD process divides are the ones shown in table 4.2.

ACTIVITY	TASKS IN WHICH THE ACTIVITY IS DIVIDED
CD1. Goal setting and educational contents from the detected needs.	CD1.1. To define the accessible teaching guides CD1.2. To formulate the objectives CD1.3. To define the competences to be obtained by the student CD1.4. To identify the topics/subjects
CD2. Definition of techniques, didactic model and inclusive methodology	CD2.1. To define the didactic models that guarantee accessibility and inclusion CD2.2. To establish the inclusive learning settings CD2.3. To identify the activities to be carried out
CD3. Definition of the organization and technical requirements which guarantee accessibility and inclusion	CD3.1. To define the roles, tasks, responsibilities and rights of the actors in the inclusive educational setting CD3.2. To define the place and time for learning CD3.3. To identify the obligatory and optional technical requirements
CD4. Design of the accessible multimedia resources and accessible communication systems	CD4.1. To select and describe the aspects of the multimedia resources (web, video, audio...) and accessible communication systems to be used in the inclusive educational process CD4.2. To select and describe the tutors, moderators and instructors for the student
CD5. Design of inclusive evaluation tests	CD5.1. To specify the evaluation tests to be made CD5.2. To validate the designed evaluation tests
CD6. Definition of the maintenance functions	CD6.1. To define the procedure to carry out the didactic and methodological updates that assure the stability in accessibility and inclusion CD6.2. To define the procedure for carrying out the updates of contents that guarantee the stability in accessibility CD6.3. To define the procedure for the technical maintenance that assures the stability in accessibility

Table 4.2. Logical order of execution of the activities in the Conception/Design Process (CD)

This proposal is complemented with a web page in www.esvial.org/guia, including an interactive list with each activity, detailing the tasks in which they divide; and for each task, (1) the results to be obtained at the end of its execution; (2) the techniques, methods or tools to apply; (3) the metrics or quality criteria to verify the correct execution of the task; and (4) the profile of the participants in the task. The system in the web page is complemented with a search engine for best reference.

5. Development/Production Process (DP)

5.1. INTRODUCTION

Currently the TIC have facilitated communication between people, as it has allowed access to digital information as an inclusive mechanism in the information society. Being able to access digital educational content, is a right which must be guaranteed for all. This allows access to the information for many people with disabilities, providing new opportunities for development within society.

If it takes into account the principle of design for all, through the development of accessible content, it can be assured in a largely compatible use. To do this, we must also take into account technological diversity that can be used in digital content, so creating universal formats should be considered depending on the target group as defined in the AM process.

According to the Stockholm Declaration of EIDD (2004) - Design for All Europe - the Design for All takes into account human diversity, trends in the life of the country, city or town in which it intervenes and the needs of the population, working with what might be called future variables, addresses the issue considering future generations and the changes resulting from progress. In short "Design for All is an ethical attitude that seeks to promote respect for human diversity, promoting social inclusion and equity".

That is why the goal of this process is to produce and / or adapt the content and / or didactic tools requiring an accessible virtual education project designed in accordance with the Conception / Design Process (CD) and respecting the rules WCAG 2.0

This process considers planning activities and dividing the job, detailed design, multimedia content development and academic software components. Further evaluation and testing of these multimedia contents and software components, in relation to its quality and accessibility; activities content maintenance and proper use of software that can generate accessible digital content are also included. And finally, the process involves not only creating content and tools from scratch but also activities related to the reuse and adaptation of pre-existing content.

It is a process that should involve people with very different profiles, from experts in the contents that should include educational resources, to software developers that may be necessary to include in these resources. Depending on the type of courses to produce, it may need the assistance of other professionals such as graphic designers, illustrators, multimedia producers, usability experts, etc. In any event, all participants must be clear about the problem of accessibility, since this process is very important to comply with the rules and standards related to the accessibility of web and multimedia content, and software applications need to develop.

5.2.   ACTIVITIES

The DP Process divides in the following activities:

- DP1. Production planning

- DP2. Accessible detailed design

- DP3. Making /Modification of accessible multimedia resources

- DP4. Technical Making/Modification of accessible educational software

- DP5. Reuse/Adaptation of Pre-existing material

- DP6. Integration and testing

Picture 5.1 shows the logical order of performing these activities. DP.1 and DP.2 activities will be performed in sequence and, once completed, could perform   production activities of material simultaneously (DP3, DP4 and DP5), finalizing the process with the integration of different types of resources and testing.

Table 5.2 a brief summary of the objectives of these activities is performed.
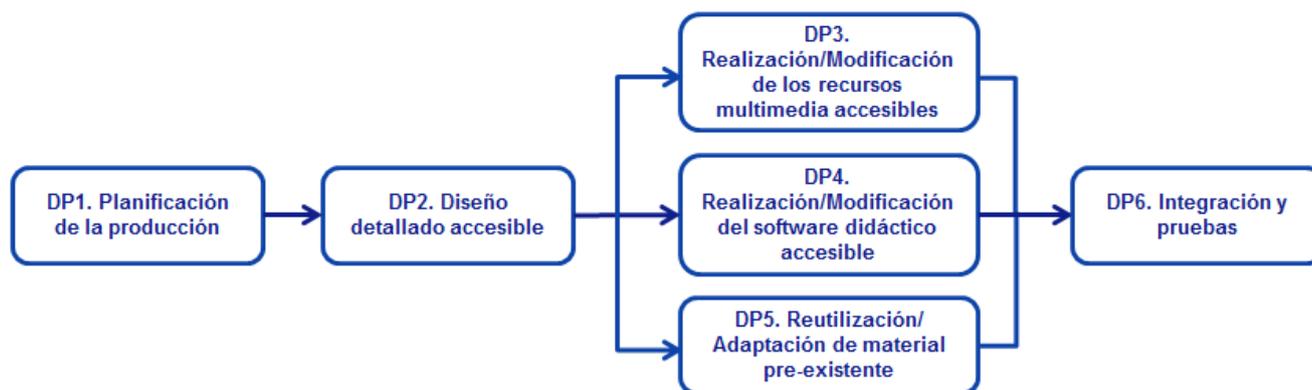
Picture 5.1 Logical order of the realization of these activities of the Development/Production Process (DP)

ACTIVITY	DESCRIPTION
DP1. Production planning	This activity has two main goals: dividing the production work accessible content from the specification of functional requirements described in the Conception / Design Process; and create a production plan for the contents, establishing the necessary resources to carry it out.
DP2. Accessible detailed design	Starting from the conceptual design or high level made in the Conception / Design Process, is now performing detailed design, or low-level multimedia educational resources to produce; through models, diagrams, specifications, etc., sufficiently detailed and always considering compliance with the norms and standards for usability and accessibility that are applicable.

DP3. Making /Modification of accessible multimedia resources	Upon completion of the detailed design of the resources in this activity, the production of these resources would take place, according to the defined specifications. Since the methodology suggests to base on the interactive design of cycle-production-Implementation-Learning-evaluation; on many occasions, this activity does not involve the realization of new resources but in modifying existing resources, as a result of the evaluation carried out in the previous cycle, as determined by modifying the design or content. It is also important to try these resources through different types of evidence, including accessibility. The tests require participation of experts that apply heuristics but also end users.
DP4. Making/Modification of accessible educational software	When a course should include some type of software application that has to be developed, this activity will be held. This software is not the software of the Learning platform (LMS), but some sort of didactic application that is created for students, such as animation, video game, etc., which could be packaged and deployed on any LMS platform, as an educational resource, more than one training activity. As in the case of multimedia contents, also the software that will be developed, must comply with the rules and standards on accessibility of relevant software. In many cases, this activity does not consist in carrying out new software, but in modifying the existing one.
DP5 Reuse/Adaptation of Pre-existing material.	In addition to the creation of multimedia resources or new software, existing material can be used. The reuse and adaptation activity, is expected to review existing material and determine whether it can be adopted or redesigned; and if so perform actions for reuse, purpose and re-adaptation of such materials. It is important to analyze in each case the advantages and disadvantages of the reuse of existing materials against the creation of new materials, considering aspects of legal, economic, technical or pedagogical type.
DP6. Integration and testing	Although planned testing as part of the resource production (DP3), software (DP4) and pre-existing material (DP5), this integration activity is necessary, since there is a dependency between DP3, DP4 and DP5. Not only the accessibility must be guaranteed in these three activities, but also integration itself may require changes to guarantee the accessibility in the final result.

Table 5.1 Brief description of the activities of the Development/Production Process (DP)

5.3.   TASKS

The tasks in which the DP process divides, are shown at table 5.2

ACTIVITY	TASKS IN WHICH THE ACTIVITY IS DIVIDED
DP1. Production planning	DP1. 1 Divide the production work of accessible contents. DP1. 2 Production Planning.
DP2. Accessible detailed design	DP2. 1 Make an accessible detailed design for multimedia resources DP2.2 Interactions design
DP3. Making /Modification of accessible multimedia resources	DP3.1 Produce accessible multimedia resources DP3.2 Test accessible multimedia resources

DP4. Making/Modification of accessible educational software	DP4. 1 Development of accessible educational software DP4. 2 Testing of accessible educational software
DP5. Reuse/Adaptation of Pre-existing material	DP 5.1 Review existing material and determine whether it can be adopted or redesigned DP5.2 Test action to reuse, re-purpose and adaptation of pre-existing materials
DP6. Integration and testing	DP 6.1 Integration of multimedia resources, software and reused materials DP 6.2 Integration and functional testing

Table 5.2 shows the division of the activities of the Development/Production Process (DP)

This proposal is complemented with a web page in www.esvial.org/guia, including an interactive list with each activity, detailing the tasks in which they divide; and for each task, (1) the results to be obtained at the end of its execution; (2) the techniques, methods or tools to apply; (3) the metrics or quality criteria to verify the correct execution of the task; and (4) the profile of the participants in the task. The system in the web page is complemented with a search engine for best reference.

6. *Implementation Process (IM)*

6.1. INTRODUCTION

The goal of this process is the creation of an accessible virtual environment, that allows an integrated organization of the developed accessible contents, proposing a mediating structure that allows the proper implementation of the Learning-Teaching methodology established for the target group of the educational project.

The Teaching-Learning virtual environment will be then, the designated space so the students can develop their education by the interaction that they made with proposed contents through tools, resources, activities and spaces destined to the communication and information exchanged. Therefore, it is important to generate a structured environment, socio-cultural interaction, where participants take ownership of knowledge, skills and values from the pedagogical model that supports it.

The Implementation involves setting up an integrated, holistic and dynamic process to guarantee proper operation of accessible educational resources on an actual operating environment. And in this case, the preparation of such environment to allow an automatic adaptability of the same educational resources as well as virtual platform accessible when subsequently accessing students with different profiles and preferences.

The Implementation Process is not only limited to the successful deployment of educational resources, but also must guarantee a support structure of users (students, teachers, technical, administrative), including training if needed; and guarantee the organization of the technical infrastructure, especially in terms of its accessibility and security.

Finally, during this process, it will be important to take under consideration quality criteria that meets the principles that encompass all aspects that must be considered when evaluating virtual environments: functionality, flexibility, interactivity, usability, accessibility.

6.2. ACTIVITIES

The IM Process divides in the following two activities:

- IM1. Installation and activation of educational resources at the Learning platform.

- IM2. Organization of technical support and to users.

Picture 6.1 shows the logical order of performing these activities. The activities are organized into two blocks. IM1 and IM2 activities will be made in sequence to finally get to have the educational resources installed and operating.

In table 6.2 a brief summary of the objectives of these activities is presented.
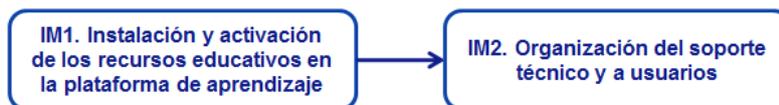
Picture 6.1 Logical order of execution of the activities of the Implementation Process (IM)

ACTIVITY	DESCRIPTION
IM1. Installation and activation of educational resources at the Learning platform.	In this activity the Learning Platform is prepared (LMS) where it will be used during the course; with its expected components in the instructional design of the training, held in the Conception/Design Process (CD). If an adaptive platform is going to be used, necessary extensions should be installed too, so the platform can adapt automatically during its use by the students, depending on their preferences. Once the platform is prepared, it is proceed to the deployment of educational resources and their integration in instructional design. Tests are made at the Learning environment until the course is ready and operational.
IM2. Organization of technical support and to users.	Once the virtual course installed, it is time to organize technical support to guarantee system security and data users, and management procedures for system maintenance, technical documentation and software licenses necessary to teach the course. Also to organize attention support to the end users of the virtual course (teachers and students), providing care service, and considering that those users might be disabled.

Table 6.1 Brief description of the activities of the Implementation Process (IM)

6.3.   TASKS

The tasks where IM process divides are shown on table 6.2

ACTIVITY	TASKS IN WHICH THE ACTIVITY IS DIVIDED
IM1. Installation and activation of educational resources at the Learning platform.	IM1.1 Prepare the Learning Platform (LMS). IM 1.2 Integrate educational resources and didactical design. IM 1.3 Tests are made at the Learning environment
IM2. Organization of technical support and to users.	IM2.1 Organize the technical support. IM2.1 Organize the user support.

Table 6.2. Division of the activities of the Implementation Process (IM)

Division of the activities of the Implementation Process (IM)

This proposal is complemented with a web page in www.esvial.org/guia, including an interactive list with each activity, detailing the tasks in which they divide; and for each task, (1) the results to be obtained at the end of its execution; (2) the techniques, methods or tools to apply; (3) the metrics or quality criteria to verify the correct execution of the task; and (4) the profile of the participants in the task. The system in the web page is complemented with a search engine for best reference.

7. Learning Process (PA)

7.1. INTRODUCTION

The goal of this process is to conduct teaching-learning using implanted inclusive educational resources, institutional arrangements need to be made for enrollment where necessary, training process and evaluation of the participants for the proposed course.

This is how it begins, to constitute Learning experiences that consider all students with and without disabilities, formalizing linking the student in one of the programs offered by the school. First, it must meet and certify student information, and to that extent, provide the supports, tools and guidance according to their needs and differences. Some individual and institutional responsibilities are established in this part, to contribute to learning in an accessible virtual educational environment and focused in the student´s needs.

When the student is an active member of the school community, institutional services are informed to support their comprehensive training. In this case, it may need to create opportunities for training in the use of assistive technologies and navigation in virtual Learning environments or alliances with institutions that could provide support during the process. It also requires the registration of preferences to identify their style of Learning, information that can be obtained from the first process proposed by the Guide (AN and AM process). This latter requires to guarantee anonymity and confidentiality of the data collected for students with disabilities and, where appropriate, an informed consent if they participate in the process of verification and evaluation of the developed prototypes.

After defining these requirements, it will continue by reviewing necessary activities for enrollment, with particular emphasis on those processes that allow the inclusion of students with disabilities, and then track the use of resources and tools during the course, and finally to an inclusive evaluation for his certification and accreditation.

This process also takes into account the training of all personnel involved in the use of assistive technologies and navigation in learning virtual environments, so that they can perform their efforts in creating an accessible and inclusive educational environment. It is important to mention that it is vitally important that the tutor has the capabilities, skills and management skills and delivery of the course, a way to generate an inclusive teaching-learning environment.

Finally, the accessible virtual training frames the educational goals in teaching and learning of all students, from the execution of a virtual curriculum created with the universal design techniques and the development of inclusive teaching practices in an environment that encourages achievement and participation in training activities.

Parallel to this process, in order to assess the competences for promotion and as input for continuous improvement, assessment of knowledge, participants, educational environments and services that "mainstream" or happen in teaching and learning environments.

7.2.   ACTIVITIES

The PA Process divides in the following 4 activities:

- PA1. Enrollment management

- PA2. Registration of preferences, adaptation of the learning platform and, initial instruction.

- PA3. Execution of virtual accessible inclusive training and treatment of accessibility

- PA4. Inclusive assessment

Picture 7.1 shows the logical order of performing these activities. PA.3 and PA.4 activities are performed simultaneously with the rest; but PA.1 and PA.2 activities will be made in sequence.

In table 7.2 a brief summary of the objectives of these activities is performed.
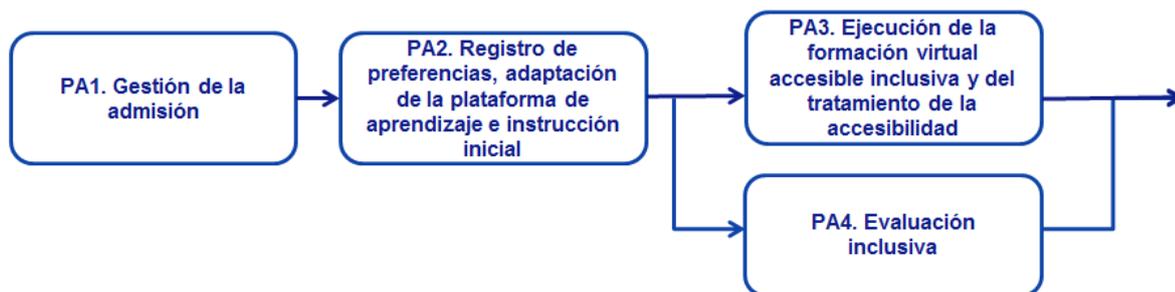
Picture 7.1 Logical order of realization of the activities of the Implementation Process (IM)

ACTIVITY	DESCRIPTION

PA1 Enrollment management	This activity contains the procedure with academic, administrative and financial requirements for the student to perform the registration and enrollment in a virtual accessible educational program. With the tasks it is intended to obtain student´s personal and academic information, and their interaction needs, legalize payment of their rights (if this is required) and formalize the responsibility of the provider institution of educational services, providing all organizational components that facilitate the Learning of all students.
PA2. Registration of preferences, adaptation of the learning platform and initial instruction.	This activity pretends that the student knows resources and institutional services, rights and duties, and has an initial training in the use of Virtual Learning tools and technologies support according to his preferences and needs. From the record of their preferences and needs of interaction, proceed to manual or automatic adaptation of the learning platform and educational resources, as has been provided in the activity.
PA3. Execution of virtual inclusive training and accessible treatment of accessibility	This activity specifies the teaching and Learning process, from inclusive instructional design made in the Conception / Design Process and using the available educational resources developed during the Development/Production Process (DP). It is especially important to guarantee that students with disabilities have access to a support from the staff that meets their needs for interaction and advise them on the technical options available to address them.
PA4. Inclusive evaluation	This activity is similar to the implementation of training, because it makes a learning assessment and knowledge transfer according to the promotion criteria, and implementing inclusive assessment instruments designed during the Conception/Design Process (CD)

Table 7.1 Brief description of the activities of the Implementation Process (IM)

7.3.   TASKS

The tasks where IM process divides are shown on table 7.2

.ACTIVITY	TASKS IN WHICH THE ACTIVITY IS DIVIDED
PA1. Enrollment management	PA1. 1 Obtain student´s information and needs of interaction. PA1.2 Process invoicing/accounting PA1.3 Provide to the student the organizational components that facilitates his learning.
PA2. Registration of preferences, adaptation of the learning platform and initial instruction.	PA2.1 Introduce institutional services provided by the University to the student's community PA2.2 Record the needs and preferences of the student and adapt the learning platform PA2.3 Train users in virtual environments of accessible learning and in the support usage of technologies.
PA3. Execution of inclusive virtual training and accessible treatment of accessibility	PA3.1 Implement the pedagogical, didactic, methodological and technical support PA3.2 Execute teaching as pedagogical model and preferences
PA4. Inclusive assessment	PA4.1 Assess the learning and knowledge transference PA4.2 Process student´s results

Table 7.2 Division of the activities of the Implementation Process (IM)

This proposal is complemented with a web page in www.esvial.org/guia, including an interactive list with each activity, detailing the tasks in which they divide; and for each task, (1) the results to be obtained at the end of its execution; (2) the techniques, methods or tools to apply; (3) the metrics or quality criteria to verify the correct execution of the task; and (4) the profile of the participants in the task. The system in the web page is complemented with a search engine for best reference.

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8. Evaluation/Optimization Process (EO)

8.1. INTRODUCTION

To evaluate an educational project refers to the search of information and, creation of evidence that allows to construct judgments and/or guidelines of the actions to be achieved through the goals outlined in the educational proposal. So it is necessary to evaluate both internally and externally, taking into account that an internal evaluation is conducted by members of the project and an outer one is made by outside experts on the subject.

In the analysis it is important to systematize all information in internal reports, and optionally external. The contrast between the two reports confers greater validity and richness to the evaluation. This process should establish the feasibility, effectiveness and efficiency of training actions to meet the goals. The scope of the evaluation will be to focus on the application of research techniques that are used to generate the data and recommendations to implement the improvement plan for future editions.

This is a transversal process, which includes all that is necessary for evaluation and quality control of each of the above processes involved in virtual inclusive educational project activities included. This will involve careful analysis, to audit what it is done in each of the basic processes of virtual training:

Needs Analysis (AN), Framework Analysis (AM), Conception/Design (CD), Development/Production (DP), Implementation (IM), and Learning (PA).

In this process, validation of collected information should be taken, as the results of this analysis should serve throughout all stages of the process to structure the recommendations and, lessons learned to help make the necessary corrective actions and improving future implementations of the training process. As evidenced in the name of the process, the importance of the evaluation is optimization.

This is an effort to detect possible problems or deficiencies and generate strategies to solve them.

This requires, finding elements for improvement and communicate them to the right people who can implement improvement actions at all levels: organizational, administrative,

methodological, teaching and technical, among others. During the assessment process it is important to take into account the student´s opinion, first during their Learning Process with a continuous assessment to resolve those aspects that can be remedied and then at the end of their training, allowing to correct or improve the deficiencies for subsequent editions.

This can be done through surveys that show the student's satisfaction with the environment and resources of Learning provision and support received by the tutor, coordinator and technical education during teaching-learning process.

The assessment should also allow the responsible team of the training process to be aware of meeting the objectives set along the different stages of the project, so that they can take appropriate decisions at the time they are required.

8.2.   ACTIVITIES

The EO process divides in the following 4 activities:

- EO1. Planning for the evaluation and optimization

- EO2. Information gathering

- EO3. Analysis of the obtained information

- EO4. Optimization

Picture 8.1 shows the logical order of performing these activities. EO.2, EO.3 and EO.4 activities are performed simultaneously once the EO.1 planning activity is concluded. In Table 8.2 a brief summary of the objectives of these activities is shown.
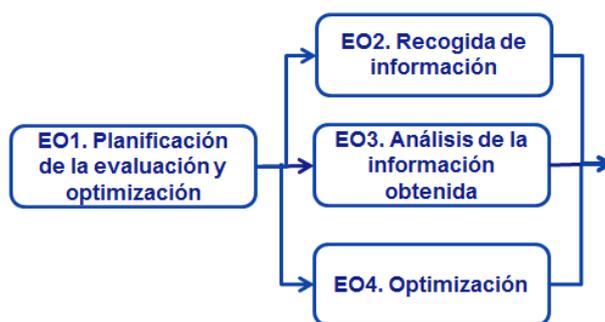
Picture 8.1 Logical order of performing the activities of the Evaluation/Optimization Process (EO)

ACTIVITY	DESCRIPTION
EO1. . Planning of the evaluation and optimization.	In this activity, five questions needs to be answered: Why evaluate?

	(The objectives of the evaluation), What to evaluate? (Aspects to evaluate), When to evaluate? Who should participate during the evaluation process? And, How to evaluate? For all of this, what is needed to establish instruments and evaluation criteria that considers the needs arising from inclusive education? Interactive methods should be provided to access to the evaluations, so the problems can be addressed when detected, without the need of waiting for final evaluation results. Evaluation planning must be compatible with the project evaluation all together, thorough AM4 activity.
EO2 Information gathering	In this activity, once the plan is to continue to carry out the collection of information is organized, it continues to the collection of information from each of the processes involved in inclusive virtual training: Analysis Needs (AN), Framework Analysis (AM), Conception/Design (CD), Development/Production (DP), Implementation (IM), y Learning (PA). This activity should take care of validating the information gathered.
EO3 Analysis of the obtained information.	The purpose of this activity is to systematize information, to deduct and suggest avenues for improvement. This systematization is presented in the reports, which will be the basis for valuation and decision making. It is important to access the partial evaluations to address problems as they arise, without waiting for the complete final evaluation reports.
EO4. Optimization	In the case that internal and external evaluation is made, both reports may be contrasted and, draw conclusions for the improvement plan. In this last phase, it is very important to disseminate evaluation among members of the university community and among those directly responsible for training.

Table 8.1 Brief description of the activities of the Evaluation/Optimization Process (EO)

8.3. TASKS

The tasks were the EO process divides are shown on table 8.2

ACTIVITY	TASKS IN WHICH THE ACTIVITY IS DIVIDED
EO1. Planning of the evaluation and optimization.	EO1.1 Define the objectives of the evaluation (What for) EO1.2 Identify aspects to be evaluated (What) EO1.3 Establish a time frame (When) EO1.4 Identify the evaluators (Whom) EO1.5 Build instruments and define criteria of internal and external evaluation that guarantee accessibility of the entire project (How)
EO2 Information gathering	EO2.1 Gather information from the Needs Analysis process (AN). EO2.2 Gather information from the Framework analysis process (AM). EO2.3 Gather information from the Conception/Design process (CD). EO2.4 Gather information from the Development/Production Process (DP). EO2.5 Gather information from the Implementation Process (IM) EO2.6 Gather information from the Learning Process (PA) EO2.7 Validate gathered information.
EO3 Analysis of the obtained information.	EO3.1 Analyze and prepare reports per process. EO3.2 Analyze and prepare global report. EO3.3 Prepare external reports (optional)
EO4. Optimization	EO4.1 Contrasting reports of external and internal evaluation (optional) EO4.2 Prepare final conclusions and improvement plan. EO4.3 Communicate results and recommendations.

Table 8.2 Division of the activities of the Evaluation/Optimization Process (EO)

This proposal is complemented with a web page in www.esvial.org/guia, including an interactive list with each activity, detailing the tasks in which they divide; and for each task, (1) the results to be obtained at the end of its execution; (2) the techniques, methods or tools to apply; (3) the metrics or quality criteria to verify the correct execution of the task; and (4) the profile of the participants in the task. The system in the web page is complemented with a search engine for best reference.

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