

# UXD and UCD Approaches for Accessible Education

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This chapter presents in a descriptive and visual way the evolution of accessibility metadata in educational resources, considering the different organizations and projects that contributed in investigations and establishment of standards for their implementation. The purpose is to justify the importance of its application in the optimal search of educational resources that responds to the needs and preferences of the user, considering the variability of learning and emphasizing the even greater requirements when dealing with students with disabilities. Accessibility is an issue that is developed optimally, and its adoption is increasing; however, in the area of virtual environments and digital educational resources, the use of accessibility metadata is still incipient and requires to be understood from its implementation of comprehensive manner and the suitability of its application.

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There are some similarities in developing distance education online courses and Massive Open Online Courses (MOOCs) using the basis of eLearning instructional design. However, the task of converting an online course into a MOOC is not as simple as direct migration of eLearning materials and assessment

resources into a MOOC platform. In online learning, learners should be continually influenced by information, social interaction, and learning experiences, providing them with the knowledge to come up with new ideas to develop within an engaging course. In this chapter, the process of MOOCification a distance education online course on “Design for All for an Inclusive and Accessible Society” is explained and contextualized. The re-factorization process has been based upon the quality model used for MOOCs at UNED Abierta and the instructional design based on Gagné’s events of instruction. The eLearning activities were completely refactored, along with the content itself, the interaction events, and the online assessment following the Gardner’s multiple intelligences product grid.

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Accessibility has been defined as the ability of an object to be used despite the condition or disability of a person. However, it is a feature that often has not been taken into account in the design of products or services, and the mobile serious game market is no exception. Accessibility guidelines were defined through the consolidation of different initiatives and good practices of video game developers as well as groups interested in providing accessibility to video games. Once the guidelines were defined, a method for evaluating the accessibility of mobile serious games was developed and applied in a mobile serious game. The purpose of this document is to propose an evaluation tool for those who wish to develop accessible mobile serious games for people with impairments and improve inclusive education.

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This chapter discusses universal design strategies that could be implemented in online courses. The author discusses the application of universal design (UD) principles in a large (180 students) online Computer Applications in Hospitality, Retail, and Sport Management course. A survey was completed by students to determine the impact of UD strategies that were incorporated in the course. The results showed the ability to use learning aids when completing assignments, receiving instant feedback on assignments and the ability to complete course assignments unlimited times before the due date are impactful to student learning. The purpose of this chapter is to provide educators with a bank of UD strategies that can be used in online courses.

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A thorough and robust understanding of responsible and ethical practices in UX is essential to user experience designers. Ethical UX practices include authentic inclusion, vulnerability in participants, the inclusion of IRB-protected groups in research, tolerance for risk and motivation, truth in research, fair and respectful conduct, informed consent, cultural sensitivity, accessibility in UX processes, stigmatized

populations, idiosyncratic populations, right to privacy, and an understanding of ADA-compliant accommodations by UX researchers and participants. This chapter will introduce these principles as well as demonstrate one possible application in an undergraduate design classroom.

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The objective of this chapter was to assess the impact that haptic tools have on the experience of people with some kind of visual impairment when accessing a building. The analysis was performed through the application of a case study carried out in the facilities of the Center for Teleinformatics and Industrial Production of the National Learning Service in Popayán, Colombia with the participation of five people. Taking into account the principles of universal design, the analysis considered people with total blindness, partial blindness, and people without visual limitation. Participants provided feedback and insights on their experience locating the designated area with and without the support of defined haptic tools. The study resulted in a set of drawbacks that influence the location of visually impaired people. Such findings can be taken into account by people who wish to make projects of access to physical spaces of visually impaired people.

## Chapter 7

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<i>Samirna Collazos, Independent Researcher, Colombia</i>	
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This chapter was intended to emphasize the need of user-centered technology for the current generation of learners: “Multipotentialites.” The scenario suggests that fostering attention in Multipotentialites is required for effective learning being empathy and emotions the key to achieve it. Important concepts such as user experience design (UXD) and learning experience design (LXD) were analyzed here as pivotal aspects to envision both new educational/learning processes and the environments/technologies that support them. Under this context, the chapter summarized several perceptions from experts by highlighting those Multipotentialites’ qualities and skills that should be strengthened and exploited during learning processes where attention appears to be the new IQ.

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Reading is an important competency to be developed for children in the first years of elementary school. Reading becomes a mechanism that allows the children to interact with the world and identify their characteristics. Dyslexia is one learning disability frequently manifested in elementary school, and to identify it, teachers require extra educative resources, in particular educational applications. This work proposes a process model to design and develop educational applications considering the learning needs of children with dyslexia. It involves a user-centered approach because different perceptions of several actors are considered. The performance of the proposed model is explored in a case study and an evaluation, taking into account usability and accessibility factors.

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Analysis of the Use of VR and Haptic Devices in the Teaching-Learning Process for Blind People 153

*Mitsari Lucio Alonso, Tecnológico Nacional de México IT Aguascalientes, Mexico*

*Hugo I. Medellin-Castillo, Universidad Autónoma de San Luis Potosí, Mexico*

The inclusion of people with disabilities in society is an issue that is currently becoming relevant. This is why technology is in a constant struggle to develop tools that meet the needs of this sector of the population and with it fulfill this objective. One of these disabilities is blindness. Therefore, this chapter shows an analysis of the application of virtual reality (VR) and haptic devices as support tools in the teaching-learning of people with such disabilities through the study of various projects that have implemented these technologies, obtaining the advantages and disadvantages offered by these resources. For this, an analysis is made from the point of view of accessibility that it presents as well as the approach of the user-centered design (UCD).

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*Zeoli Antonio Maldonado, Tecnológico Nacional de México IT Aguascalientes, Mexico*

Virtual reality has captured the attention of people. Since virtual reality has become more realistic, with the evolution of the technology like the innovation of smartphones, it has been more accessible for society, and many industries have begun research on the application of VR for training and for learning about certain specific topics as it allows reducing accidents and maximizes safety. Their use in the education industry has been best seen as a tool to complement certain issues that may be difficult to understand since it can allow one to virtually move to certain areas from safe areas. However, the development virtual environments is not fully specialized to implicitly include and promote learning, much less the consideration of people with disabilities. The main objective of this chapter is the presentation of a design process for the development of virtual learning environments that allows accessibility.

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Redesigning the User Interface of a Learning Platform for Social Engineering Integrating Web

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The objective of this chapter is to identify web accessibility problems in order to fulfill the design guidelines. According to the proposal, accessibility is assessed through easy checks of the implementation of the social engineering educational platform. As a first phase, the developer carries out this evaluation and his results are analyzed. The second phase solves the identified problems or at least tries to give them a solution implementing a redesign on the platform; in the same way, the results are analyzed. In the third phase, a proposal is made of the improvements that can be introduced in the redesign of the user interface in a way that best complies with the web accessibility. The problem identified shows the difficulty of implementing the accessibility guides and the need to propose accessibility implementation guidelines that guarantee their compliance.

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A Software Testing Process Based in Gamification for Children With Down Syndrome ..... 204

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Evaluating software implies challenging users' abilities during a period, applying several assessments, and analyzing their evolution. This process might turn unpleasant and stressful, especially to those susceptible to anxiety and stress, such as Down syndrome users. The poor performance of unpleasant users generates unreal results. A gamified approach for software testing is proposed that maintains user motivation and engagement and reduces anxiety and stress. Common behaviors expected are anxiety, stress, unwilling to work, and in general, lack of motivation. Using gamification, makes it possible to succeed in controlling these common negative behaviors and stimulating the positive ones including the MDA framework into a generic learnability evaluation process, linking these two elements with the psychological approach of gestalt therapy. Gamifying the testing experience increased the quality of communication between users and applicators; provided a friendly, motivational, and engaging environment; and increased the rate of testing success and the range of potential participants.

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This chapter described an analysis and those derived design improvements for an accessibility course offered by Tecnológico Nacional de México/IT Aguascalientes (ITA). The course is addressed to train professors for awareness and implementation of educational strategies that allow an accessible and inclusive learning environment. Enhancements found were oriented to makes easier teachers' tasks when generating strategies for the creation of accessible educational content. All suggestions were derived from a usability analysis of both interactive elements and the structure of the course on the on-line learning platform Moodle. The study was performed by implementing several international standards and design guides such as the traditional web content accessibility guidelines (WCAG).

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On the Development of Haptic-Virtual Learning Systems for the Education of Blind People ..... 249

*Raquel Espinosa Castañeda, Universidad Autónoma de San Luis Potosí, Mexico  
Hugo Ivan Medellín Castillo, Universidad Autónoma de San Luis Potosí, Mexico*

The concept of inclusive education goes beyond considering the needs of people with disabilities; it refers to the process of recognizing the students' learning needs and to act according to such needs. People with visual limitations do not necessarily require more attention and dedication than other people; they only need to be initially guided and to have accessible information. Thus, one of the main challenges of universal education is to generate inclusive and assistive educational technologies, which can be used for the teaching and learning of people with disabilities. In this chapter, the development and assessment of haptic-enabled virtual reality learning systems for the education of non-sighted people are presented and discussed. These virtual systems represent the research work conducted to promote the accessible education of blind people and to determine the effectiveness of virtual touch in the education of blind people.

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This chapter describes the insights towards a proposal to integrate a procedural content generation strategy in a computer role-playing usable and accessible learning video game for gaining replayability to encourage engagement and motivation in learners. In order to explain the contextual issues of the topic, the chapter includes a discussion on how computer role-playing video games impact the skills considered crucial for the work in the future—abstraction, system thinking, experimentation, and collaboration—emphasizing the importance of usability and accessibility to ensure effectiveness of the proposal. A first approach of a computer role-playing video game is presented to provide an illustrative example. The prototype will serve for future evaluations with people for usability and accessibility.

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## Preface

Standard ISO 9241-11 (2018) defines Usability as “The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use”, in this context, it is easy to perceive a strong relation between usability and accessibility. Nonetheless, accessibility is not naturally integrated in usable environments. (Lee & Lee, 2019) explain that accessibility “tends to emphasize objective features of a product and its use by people of all abilities. Accessibility pertains to a variety of components in the environment and requires guidelines for specific contexts”. There are many guidance intended to achieve accessibility goals in a wide range of products including web and virtual environments; e.g. Web Content Accessibility Guidelines (WCAG2, n.d.) which states that “people with disabilities can perceive, understand, navigate, and interact with the Web, and that they can contribute to the Web”. Another example is the well-known Web Accessibility Initiative (WAI, n.d.) which summarize essential principles of accessibility: perceivable content and interface, operable interface components for navigation and control, robust content compatible with other/future systems, and understandable content and interface.

Said context becomes particularly important in learning and educative processes, since education is a human right. People should have plenty access to education in every level (Dowden & Dowden, 2019; Elder, 2019). There are many barriers that people with disabilities face when they try to access to physical educative spaces including buildings, classrooms, and laboratories (Hamburg & Lütgen, 2019; Kim, Bessho, & Sakamura, 2019; Ackah-Jnr, & Danso, 2019). In this scenario, several technological solutions have emerged; web and virtual environments becomes popular alternatives, but many times, the proposals are not well designed since developers do not consider needs of people with disabilities (Kurt, 2019). It is crucial to ensure quality in new virtual environments for learning and to improve it in those currently available being essential both accessibility and usability (Lee & Lee, 2019; Ng, 2020; Ozdemir, Preast, & Duffy, 2018).

To realize and implement a robust need finding process that bear in mind a wide range of users is not easy and requires adequate guidance and flexibility to integrate successful approaches from other fields (Mourão & Netto, 2019; Smith & Abrams, 2019). Additionally, it is necessary to consider current technology in order to take advantage of available devices, services, software, and hardware (Kim, Bessho, & Sakamura, 2019; Lee & Lee, 2019).

In order to put together all these pieces concepts like User Centered Design (UCD) and User eXperience (UX) are mandatory. According to the Interaction Design Foundation (n.d.) “is an iterative design process in which designers focus on the users and their needs in each phase of the design process. In UCD, design teams involve users throughout the design process via a variety of research and design techniques, to create highly usable and accessible products for them”. On the other hand, UX “focuses

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on having a deep understanding of users, what they need, what they value, their abilities, and also their limitations. It also takes into account the business goals and objectives of the group managing the project. UX best practices promote improving the quality of the user's interaction with and perceptions of your product and any related services", (Interaction Design Foundation, n.d.) Said approaches could be coherently integrated into strategies that help designers and developers to conform truly accessible and inclusive learning environments.

## WHAT ABOUT THIS BOOK?

The main intention of this book is to provide a set of strategies based on principles and approaches from User eXperience Design (UXD), Human-Computer Interaction (HCI), and User Centered Design (UCD) to contribute in improving accessibility in learning environments. Here are described meaningful insights focused in aspects that could benefit accessibility and inclusiveness in learning environments by strategies to structure and convey of information, design, assessment, and redesign interactions with technology and spaces not only in the virtual context but physical. In this vein, the book integrates proposals oriented to foster awareness and ethics to design learning environments that support all students in their learning process. Insights, guidance, approaches, implementations, and even venues to explore as future work where provided here by experienced academics, practitioners, independent researchers, and postgraduate students.

As mentioned in Introduction, the book could be helpful for a wide range of target audiences:

- **Academy:** Researchers and students from related fields could use the book to reinforce, document, and/or justify their current research works and/or projects. The book could be inspirational for future academic works and could encourage initiatives for accessible governance in Institutions.
- **Government:** Accessible and equity in education represent a primary Government-goal. This book could represent a starting point for new strategies or redesign the existing ones.
- **Industry:** The book would foster improvements on design/development processes for accessible learning technology and provide guidance for implementation strategies.
- **Enthusiasts:** This book would be inspirational for many people interested in the covered topics.

## ORGANIZATION OF THE BOOK

The book was organized in two sections and 15 chapters. A brief description of the chapters is presented below:

### Section 1: Thoughts, Reflections, and Strategies on Accessible Education

- **Chapter 1.** This chapter presents in a descriptive and graphic way the evolution of accessibility metadata in educational resources, considering the different organisms and projects that contributed in investigations and establishment of standards for their implementation. The purpose is to justify the importance of its application in the optimal search of educational resources that responds to the needs and preferences of the user, considering the variability of learning and emphasizing the even greater requirements when dealing with students with disabilities. Accessibility is



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an issue that is developed optimally and its adoption is increasing, however, in the area of virtual environments and digital educational resources, the use of accessibility metadata is still incipient and requires to be understood from its implementation of comprehensive manner and the suitability of its application.

- **Chapter 2.** The chapter discuss some similarities in developing distance education online courses and Massive Open Online Courses (MOOCs), using the basis of eLearning instructional design. Authors emphasize some controversies such as the fact that the task of converting an online course into a MOOC is not as simple as direct migration of eLearning materials and assessment resources into a MOOC platform. In online learning learners should be continually influenced by information, social interaction and learning experiences, providing them with the knowledge to come up with new ideas to develop within an engaging course. In this chapter, the process of MOOCification a distance education online course on “Design for All for an Inclusive and Accessible Society” is explained and contextualized. The re-factorization process has been based upon the quality model used for MOOCs at UNED Abierta and the instructional design based on Gagné’s events of instruction. The eLearning activities were completely refactored, along with the content itself, the interaction events and the online assessment following the Gardner’s Multiple Intelligences product grid.
- **Chapter 3.** Authors considered the term Accessibility as the ability of an object to be used despite the condition or disability of a person; and argued that accessibility it is a feature that often has not been taken into account in the design of products or services and the mobile serious game market is no exception. They analyzed and defined some Accessibility guidelines defined through the consolidation of different initiatives and good practices of video game developers as well as groups interested in providing accessibility to video games. Once the guidelines were defined, a method for evaluating the accessibility of mobile serious games was developed and applied in a mobile serious game. The purpose of this document is to propose an evaluation tool for those who wish to develop accessible mobile serious games for people with impairments and improve inclusive education.
- **Chapter 4.** This chapter discusses universal design strategies that could be implemented in online courses. In the addition, the author discusses the application of universal design (UD) principles in a large (180 students) online Computer Applications in Sport and Entertainment Management course. A survey was completed by students to determine the impact of UD strategies that were incorporated in the course. The results showed the ability to use learning aids when completing assignments, receiving instant feedback on assignments and the ability to complete course assignments unlimited times before the due date are impactful to student learning. The purpose of this chapter is to provide educators with a bank of UD strategies that can be used in online courses.
- **Chapter 5.** Authors stated that a thorough and robust understanding of responsible and ethical practices in UX are essential to user experience designers. They also explain that Ethical UX practices include: authentic inclusion, vulnerability in participants, the inclusion of IRB-protected groups in research, tolerance for risk and motivation, truth in research, fair and respectful conduct, informed consent, cultural sensitivity, accessibility in UX processes, stigmatized populations, idiosyncratic populations, right to privacy, and an understanding of ADA-compliant accommodations by UX researchers and participants. This chapter will introduce these principles as well as demonstrate one possible application in an undergraduate design classroom.

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- **Chapter 6.** The objective of this chapter was to assess the impact that haptic tools have on the experience of people with some kind of visual impairment when accessing a building. The analysis was performed through the application of a case study carried out in the facilities of the Center for Teleinformatics and Industrial Production of the National Learning Service in Popayán - Colombia with the participation of 5 people. Taking into account the principles of Universal Design, the analysis considered people with total blindness, partial blindness and people without visual limitation. Participants provided feedback and insights on their experience locating the designated area with and without the support of defined haptic tools. The study resulted in a set of drawbacks that influence the location of visually impaired people, such findings can be taken into account by people who wish to make projects of access to physical spaces of visually impaired people.
- **Chapter 7.** This chapter was intended to emphasize the need of user-centered technology for current generation of learners: “Multipotentialites”. The scenario suggests that fostering attention in Multipotentialites is required for effective learning being empathy and emotions the key to achieve it. Important concepts such as User eXperience Design (UXD) and Learning eXperience Design (LXD) were analyzed here as pivotal aspects to envision both new educational / learning processes, and the environments / technologies that support them. Under this context, the chapter summarized several perceptions from experts by highlighting those Multipotentialites’ qualities and skills that should be strengthened and exploited during learning processes where attention appears to be the new IQ.
- **Chapter 8.** The chapter emphasized reading as an important competency to be developed for children in the first years of elementary school since reading becomes a mechanism that allows the children to interact with the world and identify their characteristics. Author explained why Dyslexia is one of learning disability frequently manifested at elementary school, and how teachers require identify extra educative resources such as educational applications. This work proposes as solution a process model to design and develop educational applications considering the learning needs of children with dyslexia. It involves a user-centered approach because different perceptions of several actors are considered since the early phases of the process. The performance of the proposed model is thorough out a case study and an evaluation considering usability and accessibility factors.
- **Chapter 9.** Authors of this chapter argued that the inclusion of people with disabilities in society is an issue that is currently becoming relevant, this is why technology is in a constant struggle to develop tools that meet the needs of this sector of the population and with it fulfill this objective. They considered that one of said disabilities is blindness, therefore, this chapter shows an analysis of the application of Virtual Reality (VR) and haptic devices as support tools in the teaching-learning of people with such disabilities through the study of various projects that has implement these technologies, Obtaining the advantages and disadvantages offered by these resources. For this, an analysis is made from the point of view of accessibility that it presents as well as the approach of the User Centered Design (UCD).

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### Section 2: Design, Assessment, and Redesign of Technology for Accessible Education

- **Chapter 10.** Author of this chapter describe how Virtual Reality has captured the attention of people. Since the Virtual Reality has become more realistic, with the evolution of the technology like the innovation of smartphones, the VR has been more accessible for society, many industries have begun research on the application of VR for training, for learning about certain specific topics as it allows reducing accidents and maximizes safety. Author emphasize that the use of VR in Education Industry has been best seen as a tool to complement certain issues that may be difficult to understand since it can allow to virtually move to certain areas from safely areas. And identified the lack of design and development strategies fully specialized to implicitly include the promote learning, much less the consideration of people with disabilities. In this vein, the main objective of this chapter is the presentation of a design process for the development of Virtual Learning Environments that allows accessibility.
- **Chapter 11.** The objective of this chapter is to identify web accessibility problems in order to fulfill the design guidelines. According to the proposal, accessibility is assessed through easy checks of the implementation of the social engineering educational platform. As a first phase, the developer carries out this evaluation and their results are analyzed. In the second phase, solves the identified problems or at least tries to give them a solution implementing a redesign on the platform; in the same way the results are analyzed. In the third phase, a proposal is made of the improvements that can be introduced in the redesign of the user interface in a way that best complies with the web accessibility. The problem identified shows the difficulty of implementing the accessibility guides and the need to propose accessibility implementation guidelines that guarantee their compliance.
- **Chapter 12.** Author explained how evaluating software implies challenging users' abilities during a period, applying several assessments and analyzing their evolution. He described why this process might turn unpleasant and stressful, especially to those susceptible to anxiety and stress, such as Down syndrome users. Additionally, analyze how the poor performance of unpleasant users generates unreal results. A gamified approach for software testing is proposed here, which maintains user's motivation and engagement, and reduces anxiety and stress. Common behaviors expected are anxiety, stress, unwilling to work and, in general, lack of motivation. The proposal showed how using gamification, makes possible succeed in controlling common negative behaviors mentioned and stimulating the positive ones. The process included the MDA framework into a generic learnability evaluation process, linking these two elements with the psychological approach of Gestalt therapy. Founds showed how gamifying the testing experience increased the quality of communication between users and applicators, provided a friendly, motivational, and engaging environment, and increased the rate of testing success and the range of potential participants.
- **Chapter 13.** The chapter described an analysis and those derived design improvements for an Accessibility course offered by Tecnológico Nacional de México / IT Aguascalientes (ITA). The course is addressed to train professors for awareness and implementation of educational strategies that allow an accessible and inclusive learning environment. Enhancements found was oriented to makes easier teachers' tasks when generating strategies for the creation of accessible educational content. All suggestions derived from a usability analysis of both: Interactive elements and the structure of the course on the on-line learning platform Moodle. The study was performed by im-

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plementing several international standards and design guides such as the traditional Web Content Accessibility Guidelines (WCAG).

- **Chapter 14.** Authors explained that concept of inclusive education goes beyond considering the needs of people with disabilities; it refers to the process of recognizing the students' learning needs and to act according to such needs. They discussed why people with visual limitations do not necessarily require more attention and dedication than other people; since many times just an initially guided and to have accessible information were required. The chapter emphasize that one of the main challenges of the universal education is to generate inclusive and assistive educational technologies, which can be used for the teaching and learning of people with disabilities. In this chapter the development and assessment of haptic-enabled virtual reality learning systems for the education of non-sighted people are presented and discussed. These virtual systems represent the research work conducted to promote the accessible education of blind people, and to determine the effectiveness of virtual touch in the education of blind people.
- **Chapter 15.** This chapter was intended to describe the insights towards a proposal to integrate a procedural content generation strategy in a computer role-playing usable and accessible learning video game for gaining replayability to encourage engagement and motivation in learners. In order to explain the contextual issues of the topic, authors included a discussion on how computer role-playing video games impact on the skills considered as crucial for the work in the future abstraction, system thinking, experimentation and collaboration emphasizing the importance of usability and accessibility to ensure effectiveness of the proposal. A first approach of a computer role-playing video game is presented to provide an illustrative example and to establish a starting point for future evaluations with people for usability and accessibility.

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Our sincere gratitude goes to the chapter's authors and coauthors who contributed their invaluable time, knowledge, and expertise to this book.

# Introduction

UNESCO (n.d.) states that “Ensuring that each individual has an equal opportunity for educational progress remains a challenge worldwide” and emphasize that inclusion and equity are fundamentals in education quality. Education is a human right, and no one should be excluded from, or limited to educational opportunities.

In this context, institutions, educators, students, and many other stakeholders will require technology that support inclusion and promote equity for both learning processes and governance in educational institutions.

This scenario has been encouraging the development and implementation of guidelines for accessible education, particularly for learning through technology since virtual education appear to be the learning modality for the future. Alternatives are oriented to adapt and generate educational programs and solutions compatible with inclusive and accessible learning, e.g. the UNESCO Guidelines for inclusion: ensuring access to education for all (UNESCO, n.d.) Guidelines on accessible education, of Ontario Human Rights Commission (n.d.), among others.

Initiatives as those mentioned above states a general frame for accessibility but should be complemented by specific approaches addressed to ensure good designs (those that help people do things that they care about). According to the Design Council (n.d.) “The central premise of User Centered Design is that the best designed products and services result from understanding the needs of the people who will use them”; so, a well understanding of users needs its imperative to achieve adequate learning technology. Traditionally, User Centered-Design Process, Human-Computer Interaction, and User eXperience Design represent the way to do this job. Nevertheless, many of the available proposals in these fields tend to focus on integrating ease of use and aesthetic design on technological solutions leaving aside accessibility aspects. Professionals around the world are very concerned about this; e.g. Sheena Lyonais, Writer and digital specialist, wrote on the Billy Gregory’s (Web accessibility developer, Director of Training with The Paciello Group) perception “It’s a UX designer’s job to think of all users, not some Users” to avoid the concept “SOME Users eXperience, a.k.a. SUX” that refers to “user experiences that suit the larger population overall, but do not go the extra step to ensure they’re usable and accessible for all users” (“Why Designing”, n.d.).

It is true that design is a crucial piece of the puzzle and demand guidance to be perceived as good design, e.g. by implementing User Centered-Design and /or User eXperience Design; but should consider accessibility aspects from early stages of design processes. This integration allows to understand users’ needs from an inclusive perspective. In this way; to be usable in educational technology is not enough and have a tremendous impact in designing accessible technology for education since education is a Human right (UNESCO, n.d.) and every resource should be accessible and usable for all people.

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Integration of usability and accessibility in learning technology could be a complicated endeavor and need to be structured over a controlled and evolutive process oriented to design solutions that could offer adequate experiences for users.

This book is intended to promote in readers the importance of considering the User eXperience Design, User Centered-Design processes, and accessibility criteria by means of guidance and frameworks in order to develop technology (Hardware, Software, or Services) for truly accessible and equity education. This book describes and discusses the perception of practitioners, researchers, academics, organizations, institutions, students, industrial, and enthusiasts on design and development of accessible and equity learning technology. This thoughts and background come from Human Computer-Interaction, User Centered-Design, User eXperience Design, Learning User eXperience, User Research, Technology Education, Design Thinking, among other related knowledge fields. provided by to contributing from our “trench” to mitigate this global challenge.

In this way, the book could be helpful for a wide range of target audience:

- **Academy:** Researchers and students from related fields could use the book to reinforce, document, and/or justify their current research works and/or projects. The book could be inspirational for future academic works and could encourage initiatives for accessible governance in Institutions.
- **Government:** Accessible and equity in education represent a primary Government-goal. This book could represent a starting point for new strategies or redesign the existing ones.
- **Industry:** The book would foster improvements on design/development processes for accessible learning technology and provide guidance for implementation strategies.
- **Enthusiasts:** This book would be inspirational for many people interested in the covered topics.

On the other hand, it is true that other books in the market address brilliantly (but separately) the project’s topics A) User eXperience Design and User Centered Design approaches; and B) Designing Accessible Educational Technology; such as *End-User Considerations in Educational Technology Design* by Roscoe, R. D., Craig, S. D., & Douglas (2017) where editors put together knowledge on “usability testing techniques and user-centered design methodologies in the development of technological tools for learning environments”; and *Design for Inclusivity: A Practical Guide to Accessible, Innovative and User-Centered Design (Design for Social Responsibility)* by Coleman, Clarkson and Cassim (2016); here, authors emphasize that “inclusive design not only ensures that products, services, interfaces and environments are easier to use for those with special needs or limitations, but in doing so also makes them better for everyone.” User eXperience and User Centered Design Approaches for Accessible Education is intended to integrate both topics to conform a coherent reference for academics, students, researchers, and practitioners on designing, developing, and implementing accessible learning technology by putting together knowledge from the *trenches*.

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