Quality, accessibility and innovation in Virtual Higher Education
THE ACAI-LA PROJECT

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Foreword

This work is born as a corollary of a research and work process based on a project approved and financed by the European Union within the framework of the Erasmus+ Program, Key Action 2: Capacity Building in the field of Higher Education, called ACAI-LA[1], "Adoption of quality, accessibility, and innovation approaches in higher education in Latin America". It is interesting to review how it was created, what it comprises and its objective, to give a framework of reference to this publication.

The ACAI-LA project arises from social and educational changes that directly impact the higher education of Latin America and the continuous demand for quality and innovation at this educational level, since there is a delay observed in the introduction of Information and Communication Technologies (ICT) in educational curricula, as well as actions that guide the development of strategies adapted and accessible to the needs of the context and to the internationalization of the Higher Education. The latter has forced universities to break the traditional management mechanisms and establish open and networked educational initiatives that guarantee the quality and relevance of their academic programs.

A consortium was formed by three European institutions: Universidad de Alcalá (Spain), Università Telematica Internazionale UNINETTUNO (Italy) and Metropolia Ammattikorkeakoulu (Finland). United to these three, contributing with human and material resources, other six institutions of Latin American Higher Education joined: Universidad Nacional de Córdoba and Universidad Nacional del Litoral from Argentina, Fundación Universitaria Católica del Norte and Universidad del Magdalena from Colombia, Universidad

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[1] More information available in the project website ACAI-LA.

Panamericana and Universidad Galileo from Guatemala, and Universidad Americana and Universidad Nacional Autónoma de Nicaragua, León, from Nicaragua.

According to the project proposal, the proposed objectives focus on promoting the training of facilitators of pedagogical innovation, developing flexible and equitable curricula, improving the skills of teachers and HE in Latin America, enabling access to disadvantaged and vulnerable groups from an accessible virtual education, promoting the social and educational changes that allow the development of professionals who work for the improvement in the Central and South American populations.

From the above, it is clear that some of its specific objectives are: modernizing technological resources to implement open content programs, developing competencies that enhance insertion in the labour market, creating open learning objects, strengthening teachers' ICT skills, etc. Among the activities carried out, we highlight the development and execution of a "Master's Degree in Accessible and Quality Virtual Education", currently in its first edition with teachers and students who, for the most part, work as virtual education professionals in the region of Latin America, as an axis that articulates various aspects related to these objectives.

In ACAI-LA, the formation of the working groups was carried out in a joint manner, increasing cooperation between peers, and maintaining a north-south-south cooperation philosophy. The management of the project is in charge of a management team, composed of *Universidad de Alcalá*, *Universidad Nacional Autónoma de Nicaragua, León* and *Universidad de Galileo*, which have monitored the activities, ensuring their quality, through joint work in pursuit of actions that imply continuous improvement, for which practices were recovered and constructive interactions were fostered among the different Latin American institutions.

As mentioned at the beginning, this book emerges as a synthesis of the whole process undertaken so far, in this joint effort of cooperation between Latin American and European institutions, fostering the innovative potential as a vehicle that drives, at the university level, socio-economic development in Latin America. The multiple aspects involved are addressed in the following chapters.

In the first chapter, we delve and reflect, among other aspects, on the virtual HE in the European and Latin American framework, relating it to the adoption of ICT, new educational

models and the internationalization processes, and regional integration. This is how the evolution of ICT and e-learning technologies are considered, through their innovation, quality and accessibility, for its application in formal learning and the development of skills and abilities that are focused on the design of the graduate curriculum.

Subsequently, chapter two deals with the development of the virtual campus, specifically the one of ACAI-LA, as a network's service management strategy, which has allowed serving as a repository of accessible courses to different members of the educational community. The nature of innovators is emphasized, being open and accessible to the most vulnerable populations, with the "Master of Accessible and Quality Virtual Education" as the most outstanding product.

In chapter three, the quality, accessibility, and innovation of educational materials in the Higher Education are discussed, and the instrumental attributes of evaluation for each of these different aspects are considered. In particular, it delves into the work done from a progressive growth approach, taking care and highlighting the importance of addressing accessibility in each of the learning objects, and the way to achieve some of the most essential objectives within the ACAI-LA project, as the achievement of fully inclusive courses for all users.

The fourth chapter invites us to get to know the ecology of virtual education from the cases of the ACAI-LA Network university members, particularly the environments of virtual education development, analysing the mediations and convergences that this propitiates.

Chapter five presents the role of the virtual teachers and their role as a transformer of traditional education models, extending the emergence and consolidation of ICT-mediated competences within the students and themselves. The chapter reflects on the challenges and competences that are demanded to new teachers, as well as the dangers of distorting access to ICT as tools that contribute to knowledge, communication and information.

Inherently related to the previous chapter, chapter six deals in depth with the skills mediated by ICT, its strengths and potential to generate an entrepreneurial profile of graduates of higher education institutions.

Chapter seven focuses on one of the most outstanding products of the ACAI-LA project, the "Master's Degree in Accessible and Quality Virtual Education". It focuses on the

experience of its implementation, analysing, among other topics, its feasibility, the objectives, the professional profile, the curriculum, the cooperative work among the different institutions of the consortium for its dictation, as well as the possible opportunities for improvements.

The eighth chapter takes us to different regional experiences of cooperating HE institutions within the ACAI-LA consortium, consolidating a new vision of their particular internationalization processes, presenting objectives, goals and prospective visions.

Finally, in the last chapter the conclusions obtained after the months of project execution are presented.

We hope that this book will serve as a tool to replicate the ACAI-LA experience in future innovative projects in the field of Virtual Higher Education. We have fostered the regional innovation of the training centres, towards institutions that favour the development of competent, enterprising and flexible individuals in the most disadvantaged contexts, seeking to anticipate current and future challenges. We invite you to share the ideas presented in the process of implementation of the ACAI-LA project, as well as to reflect on the "know-how" that the experience gained has given us.

The texts presented in this book were thoroughly reviewed by an independent scientific publishing Committee consisting of experts in the field, who appreciate this generous and unselfish collaboration.

We would like to extend our gratitude to our students, colleagues and university authorities of the higher education institutions of the ACAI-LA project, which have significantly supported the development of the activities that have led to the progress and execution of the project.

Finally, we express our appreciation to the Education, Audiovisual and Culture Executive Agency (EACEA) of the European Commission, which has allowed us to develop the actions described in this work, nationally and internationally; fostering innovation, as well as improving quality and accessibility in Virtual Higher Education.

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Foreword in miskitu

Naha wark kana ta krikansa aisikaikanka kum wina dia net ba wina wahbi sakansa help laka kum wina union europea tabaikanka kum wal Erasmus+programka wal, acción clave 2: pawanka sip ba smalkanka tara bilara, ACAI-LA, wiyaba, "kaikanka kum yamni, an sanska kum lukanka raya wal samalkanka tara tilara latinoamerica tawanka bilara". Nitka brisa nukaia nahki muni paskanba naha wark kana, dia ai tanka briba an aniba ai lukansa, baku lika yabal kum brikabia nahki impakaia ba naha warkana wal.

Proyecto ACAI-LA takrikansa laki kaikanka kum wal tawan sat wala bilara an smalkanka kum trech pali wark takiba skul tara watlara America Latina bilara an netsa diara raya paskaia smalkanka bilara, an kaikisa tecnología dukiara aisi taim umpirasa aisi kaikaya an ulbanka kum brikaia (TIC), baku sin pawanka dukiara aisi taim netsa sinska laka ba dukiara aisaya an tasba aiska ES dukiara aisi tem. Naha las ba, winsa skul tara watla nanira smalkanka almukba suih diara raya lan takia smalkanka kau param kum red dukiara ai si tem, an sans yabia tanka pliki smalki lantakbia dukiara.

Paskansa asla takanka kum tilara asla sa europea bilara: Universidad de Alcalá (España), Università Telematica Internazionale UNINETTUNO (Italia) an Metropolia Ammattikorkeakoulu (Finlandia). Naha tilara dimi banhuansa, help laka yabi recursos humanos an materiales, an sem sat asla takanka watla masip pura kum ES America Latina wina: argentina wina Universidad Nacional de Córdoba y la Universidad Nacional del Litoral, Colombia wina Fundación Universitaria Católica del Norte y la Universidad del Magdalena, Guatemala wina Universidad Panamericana y la Universidad Galileo, an Nicaragua wina Universidad Americana y la Universidad Nacional Autónoma de Nicaragua, León.

Tanka brisa aisankara proyecto ka dukiara, wark ka nani ba daukaiaba lika uplara asla dauki aisaya naha nani dukiara bara baku lika witin nani ba smalkanka kum yabankabia tawan bilara diara raya aisanka an sinskira wal, baku lika brihuan kabia aisanka kum param an asla kira ni, smasmalkra nanira sin pawankumra dimbia sins lakara ES dukiara aisi tem America Latina bilara, baku lika asla takanka walara naha dukiara aisaras ba sin sans ka kum yabikabia lan taki yus munbia dukiara ai tawanka bilara smalkanka virtual wiyaba tilara, baku sin pawankara luki chens kum takbia wan tawanka bilara an sin wan smalkanka bilara upla

sinskira mánas brin kabia skul dimi dahn takan nani ba sin wark pleskara sipkabia ai sinskalaka ba yus munbia wan tasbaia bilara an sudamerikara sin.

Naha aisikaikanka bilkak kuk param sakisa diara nani kumkum dia wark ka nani ba brih impakaiba nah nani sa: raya paskaia wan retska tecnología dukiara aisi tem baku lika programa wala nani dimankabia ulbanka raya kum wal an param wal, baku lika wark takan kabia market warkara, an baku sin paskaia sip sa lan takanka param kum, karna taki TIC dukiara aisi tem smasmalkra nani ra, etc. Aisi kaikanka tilara, wahbi sakansa warka kum baja lika "Maestria smalkanka dukiara virtual sanka an yamni ka dukiara", kan nawas ba pat smalkanka yabisa pos cohorte baja lika smasmalkra nani an skul dimi banhuiba wal sin kan, aihkikaba,aitanka brisa sinskira kum baku virtual smalkanka bilara contry america latina bilara, baja lika lukanka kum wal naha wark kana ai taura impakbia dukiara.

ACAI-LA bilara, asla takanka wark kan na paskansa an brihuansa mex daukanka kum wal pawisa sin help laka wal wal ra, an sem alki brisa aisanka kum an lukanka kum wal sakbanka ra luki norte-sur-sur. Proyecto kan a pleskaba lika asla tanka kum wark an daukanka param kum mihtara sa baha lika Universidad de Alcalá (España), an Universidad Nacional Autónoma de Nicaragua, León an sem Universidad de Galileo (Guatemala), nah nani ba wark taki brih aulasa aisi kaikanka param kum wal yamni ka laka ba sin paski, baha lika wark kum asla taki impakanka lakara an sem praptes ba yus muni kabia asla takanka wala nani ba wal paskankara luki an wark pleka nani smalkan kara aisi ba param aisabia dukiara latino america bilara.

Aisan baku pastaura, naha ulbanka wauhka Taiana paskansa lukanka sirpi kum wina diara ailal wark takan wina nakat, naha warkana help munanka yabisa asla takanka wala nani sin latinoamericanas an europeas nani sin, aisi kaiki laki kaikankara dimansa sins banira diara raya kum dukiara an karna dauki wan walka nanira smalkaia dukiara skul ta tara watla bilara, pawan kara luki an lahla lainkara luki LA bilara.

Naha saptika wina nani aisisa dia nani naha tilara aisi kaikiba: sapta fas ra tihura wan aisisa luki saki wan tanta bribia dukiara wan aisisa,diara wala nani tilara, ES dukiara asi tem virtual bilara europa an latinoamericano aisikaikankara, prakanka kum dauki TIC wal, smalkanka raya nani an wark ka ta kriki brih aula ba tasba aiskara aikuki kuntri kum bilara. Baku lika aisisa TIC an tecnología dukiara e-learning baha lika diara raya paski aula ba tanka kat,

yamnika wal an sanska sin baku lika smalkanka kum param briaia dukiara an pawankara luki sinska laka wal lukansa naha wark kana prostgrado programna wal

Bakusin,sapta wal wan aisisa campus virtual nahki aitaura impaki aula ba, ACAI-LA sanska yabi ba wal baha lika lukan kum wal red wal wark taki,sanska yabansa kahbaika plis kum baku tecnología bilara, param yabisa cursos nani smalkanka pleska bilara. An baku sin aisi kaikisa diara raya natka kum bilara ,baku lika sanska yabisa upla nani sip stadi sanka apu nani ba lahla lainkara, baku lika naha na pawanka an sanska yamni an kuakansa diara sat nani paski brih wabia dukiara sinskira tanka kat "Maestría an virtual smalkanka sanska yamnika wal".

Sapta yuhmpa wan tem, aisansa yamni ka dukiara sanska an tols raya smalkanka bilara ES ba yabansa laki kaikbia dukiara naha nani kumi bani dukiara.aisisa sin nahki wark taki aula ba pawankara luki; baku lika sinska lakara an pawankara auiaba ACAI-LA proyecto kan wal, curso kan a aitaura wabia dukiara.

Baku sin, sapta walhwal ba, imbet wan munisa kakaira takaia kaina kir dia nani briba virtual smalkanka bilara skul tara watla bilara red ACAI-LA wal, kau paliba smalkanka virtual pawanka bilara, laki kaiki asla lukanka yabiba wal.

Sapta matsip ra marikisa nahki smalmalkra nani ba warkana impaki brih waia ba smalkanka natka nani tilara, ser muni ai skulka dimi banhui ba wal, an baku lika sinskalaka ba marikankabia TIC wal. An baku sin wan marikisa smasmalkra raya nani ba nahki muni net ba lan takaia ba an sin nahki wark takaia TIC wal wauhtaia ulbanka bilara nahki muni paski sins laka ba ser munaia, aisi kaiki ser munaia.

Prakanka kum daukansa sapta luan wal, sapta masip pura kum ba marikisa an kau tihura brihuisa TIC nani wark ka nani wal, ai karnika nani ba an smalkanka tara nani bilara.

Sapta masip pura wal ba, param marikisa proyecto ACAI-LA ba warka nani kau daukanba naha ulbanka wal, "Maestría an Educación Virtual sanska yamnika wal".

Sapta pura yuhmpa brihui dinkisa experiens kontri wala nani dukiara an asla takanka ES help ka laka wal aisi kaikanka ACAI-LA, lukanka raya kum wal, tasba aiska bilara, mariki sa dia nani ai lukanka briba wark taki impaki dahn takaia kau taura.

Las ba, sapta las bara wan marikisa dia nani wark taki balan ba naha proyectokana wal mont yuhmpa bilara.

Naha ulbisakan buk kana bila kaikisa net nani briba wan tanka briaia dukiara help laka kum kabia experiens kum baku ACAI-LA sanska yabiba wal wan kainara lukanka raya wal smalkanka tara vitual bilara. Helka laka kum yabansa lukanka raya lukanka wal kontri wala bilara centros de información wi yaba wal, asla takanka wala nani warkana aitaura impakaia wantsa kaka pawankara luki upla sinskira dauki naha experiens ka wal, plikisa sin nahki muni wark pleska kum daukaia dukiara wan kaina dukiara. Imbet munisa naha aisikaikankana ser munaia upla wala nani lukanka raya paskaia dukiara proyecto ACAI-LA, wal an luki saki "nahki daukaia" experiens ser wan munan ba wal.

Naha ulbanka ra wan marikisa buk ka aisikaiki laki kaikansa tem wal pain kabia dukiara comité editorial cientifico nani ba ai warka daukisa ulbankana wapni kabia dukiara,an tenki laka kum yabisa naha uplika naniba help ka laka kum yabisa dukiara.

Tenki ka laka kum yabaia wantsa wan skulka mahmika nanira, wan panika nanira an lalka tara nanira skul tara watla nanira wark taki banhui ba nanira, help laka tara yabanba naha aisikaikanka na aitaura impakbia dukiara proyecto ACAI-LA wark kaba.

Naha ra presant ka laka kum yabi banhuisna agencia ejecutiva smalkanka bilara, Audiovisual y cultural (EACEA) comicion europera ra sin, tinki ka laka kum yabisa kan sanska kum yabansa wark kana brih impakbia dukiara, tasba aiska bilara, aisanka daukbia smalkanka tara virtual bilara.

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Foreword in mayangna

Adika tingnita kidi batanwi kalahna kulning lani nuhni yamni karak dawi tingnita adika Unión Europea kaupak tinni sut laiwak yamwi kiwi sim kal uduhna Erasmus dawi ACAI-LA karak duwi lapakwi, yamni yamwi dawi lapakwi kiuning, muih bitik duningna kul tipni kilitna tipni nuhni balna yakat latinoamerica akat. Yamni karagki watdi yulna atning ampaut dawi batanwi kalahna kidi, ais yamwa kidi dawi kulna tani balna andika kidi, kaput dawak ninig kaning wing minit yakat.

ACAI-LA tingni kidi kalhna muih balna yalalahwa balna nitnina yakat, kul tipni nuhni balna wais sip kakawas balna kidi America Latina yakat dawi muih baisa kul kanin want balna kidi kaunah sip win minit balna dawi masin balna sip yusmunwas kidi kaunah lankalning wanki (TIC) yak, aput yayamwak barakning lani duwi kulnin lani wisamni yamwi dawi nitni lani balna yakat yusmunna atning sau aiska yakat. Adi las kidi kul uni tipni nuhni balna yakat taina lani yamni karak di yamwak kulna tani wisamni yamwa atning masin balna dawi win minit kidi balna dawi muih bitik duna atning.

Adika kal uduhna banki tinta yamyang pani balna bas karak: Universidad de Alcalá (España), Università Telematica Internazionale UNINETTUNO (Italia) y Metropolia Ammattikorkeakoulu (Finlandia). Adika aslah lapapakwi, muih balna yakat tignina laiwi. Dawi america latina kaupak tiaskau as kidi aslah kal bamak sitna banki (ES) dawk Argentina kaupak laih bangki Universidad Nacional de Córdoba dawi Universidad Nacional del Litoral, Colombia kaupak laih sakki Fundación Universitaria Católica del Norte dawi Universidad del Magdalena, Guatemala kaupak laih banki Universidad Panamericana dawi Universidad Galileo, Nicaragua kaupak laih banki Universidad Americana dawi Universidad Nacional Autónoma de Nicaragua, León.

Adika tignita kidi kulna lani duwa laih laiwi talna atning muih kul sumalyang balna yakat amput dawi tingninata yamwa bang kidi, kapaut dawak barakning lani duwa atnin hisi dawi kapapat, baisa yamni yamna atning kul sumal yang balna kidi yakat dawi Es kidi america akat, kapaut dawak tingni na sut lainin muih sip kakawas balna yakat dukih di yawabik, kaput dawak baisa yami yamnin muih balna yalalahwa yakat dawi kaput dawak kulnina balna yakaupak kalahna atning dawi tingta yamninna, kpaut dawak baisa yamni yalahna atning panina balna yakat.

Lakwi tatalna usnit amanlalana kidi laih kulning lani tuna balna kidi laih adika ki: baisa masin dawi win mint balna kidika wisamna atnin kaput dawa laih baisa yamni yus mumun warang, baraknin lani nuhni as dudarangki tinta yamning awarni yakat, kulni tani wisamni aphni yamnin, kul sumalyang balna yakat baisa TIC kidi sumalnin, etc. Kulnin lani balna yamna usnit, baisa as yamni kalahna kalaih kul tipni kilitna nuhni baisa mint yakat, win minit kidi muih bitik dunigna dawi yamni kidika. Warminit kat kul sumal yang balna yayamni dawi kul kayang yayamni yakwi dawak baisa mahni kau kidi tinta yayamwi win minit wisamni yakat bang kidi ka barakning lani nuhni as ki kulna tani duna daih yakaupak.

ACAI-LA yakat tingnita balna kidi mix yamwi kiwi, pa nunuhni balna buas karak kal pakwi aslah tinta yayamwi dawi kulni tani aslah duwi yamwi, ma kalahwa saitni dawi ma kawa saini. Adika tingnita kidi laiwi tatalwi muih kal uduhna buas, dawi kul uni tipni nuhni Alcalá (España) dawi kul uni Nacional Autónoma de Nicaragua, León kaput bik kul uni Galileo (Guatemala), kidi balna yamwak baisa tinnita adi baisa lapakwi kiwi, kal bajawi baisa tinnita adika yamni yamwi uiwi, kaput dawak baisa praptis duwi biri biri barakning lani yayamwi tinta pani balna latinoamerica yakat.

Tuna kau yulna mayang kapak adika wauni taya kidi kalahna tunan bahna kaupak warminit kat ais yamna kidi, adika tingni sut laihna kul uni nunuhni balna dawi tingta yamnin pani balna yakat latiamerica dawi europa pani kaupak, tunan duwi lapakwa kidi wilni arunka kira kapat, kul uni tipni nunuhni balna yakaupak, muku untak baraknin LA yakat.

Adika kaupak laih ampus parasni kal laiwatna yulni yulbaudarangki: adika tunan baiwi ampus parasni dawi tuhni lani duwa balna, dawi baisa di buas, ES yulni win minit yakat Europa dawi latinoamerica yak, TIC kidi amput duwi lapakwa kidi, kul wisamni dawi sau aiska aslah kal uduhwi dawi pani baisa nimin dadau balna karak aslah kalahning kapaut dawak TIC kulna tani balna duwi lapaknin masin wisasamni kalahwa yakarak, yamni dawi muih bitik duwi barakna atning, laiwi talnin ampus sins lani nukidi kaput dawak kuln tani kidi ram kal waran.

Aput bik adika yulni tunan bu yakat yul baudarangki amput barakna kidi, ACAI-LA palni kidika, win minit kidi wisam yang kapat, witing yamwa ta mahni apahwak yusmunwi lapapakna bang, kul kana pararahni bini na duna atning kul sumal yang balna yakat. Kaput dawak baisa di wisasamni yamna atning, apahni dawi muih bitik duna atning, karak dawa laih kulna tani yaksihni karangki, kul tipni kilitni nuhni baisa minit yakat hisi dawak yamni.

Dawak kulna tani bas akat, yulbaudarangki yamnini yulni, muih bitik duninna dawi kul balna yakat wisamnin ES kapat, kaput dawak laiwi talnin yaksihni as dudarang adika laiwi talna bas balna yakat. Laihdi talda yakat, taldi amput dawi barakning lani duwa yakat, main taldi dawi nuhni kulwi laiwi talna atning muih bitik yakat duninna kulna tani bitik duwa sak yakat, dawi talna atning amput dawi ACAI-LA kulna tani ban yakaupak yamni kalahnin, kulna tani nuhni as duwa kalaih bitik kau tingnina sut laihna atning muih yapak adika yus mumunwa balna yakat.

Usnit, waunitaya arungka yakat inbait mai munwi baisa sinsni lani sanni kidi amanglanin kul kayang dawi kul uni nunuhni balna aslah kal bamak sitna bankidi ACAI-LA karak, winni minit wisamni kulni balna kidika, laidi taldinah biri biri ampat dini yaksihni duningna sipkidi.

Adika waunitaya sinka kidi laih mai nikinkawi kul sumalwa balan yakat, dawi waunita amput yamwa kidi sin munnin tuna amput lankakalna daika dawi witingna yakaunah bik, TIC kulna lani munah sumalna atning, aput bik liwi talwi biri biri baisa lan kalnin yulni kul sumalyang balna yakat, kaput bik di kasuk lan kalninna TIC kidika kul yulni yaksihni sumalwa kapat, biri biri yulbaunig dawi nitni lani kalaning.

Adika tuna yulbaudada kapak aski, waunitaya tiaskau as akat laih yul bauwi baisa sinsni lani tuhni balna sumalwa yakat TIC kidi, pauni dawi parasnini duwi dawi sumalwa kidi kul kalalahna muini balna kidi ampat dawi baisa yamni lan kalna atnin.

Adika waunitaya tiaskau bu kalaih laiwi talwi ACAI-LA tinnita kidi, kidi laih, kul tipni kilitna nuhni biasa minit yakat yamni dawi muih bitik duna atning. Kulna tani duwa kalaih laiwi talna tingta yamwi kaina balna yakat dawi uk balna duwi kaina yakat bik, baisa ram yamna, kulna tani balna, ram kul kana kapat, ampus lan kalna balna, biri biri amput tingnita kidi duwi lapapakna kidi yamni yamin kulning lani yakarak, kapaut bik baisa yamni yamnin balna yakat.

Waunitaya tiaskau bas akat mai yulwi pa nuhni sah yakna balna yakat duwi kiuna ES kulna lani kidi kal bamak sitna kapay ACAI-LA karak, laiwi talna talna yaksihni wisamni as amput dawi sau aiska yakat awi lanin, kulna tani ninin kawinah, baraknin kulna tani karak.

Las akat, laidi taldaranki asikat kaiwi watna sak kidi waiku balna barakna yakat tingni adi karak.

Tajadi adika waunitaya kidi tinma sut laihna atnin ACAI-LA amput tingnita yamwi kiwayakat, win minit karak ampus di yaksihni yamwa kidika, minik yakwa atnin kidika. Yamna mayang pa nuhni balna sahyakwa yakat baisa sinsni lani wisamni, tingta yamyang balna yakat muih balna yakat tingni na sut laina atnig baraknin lani yakat, kulna tani dulauyang balna yakat muih lan awas balna yakat, kulna tani duwinah amput dawi trabil balna tanit danin warminit dawi kaiwarang balna yakat. Mana inbait mundi aiwa baisa lan kal namna ACAI-LA kulni tani balna yakat, kaput bik kulwi dakanin amput dawi yamnin kidi adika tingita yamda akat.

Adika waunitaya kidi laiwi talna muih dakni kal uduhna nunuhna bu as, yamni laiwi tatalna, lan muini balna kaupak, bajan adika wunitaya munah tinkih lani diyadi laiwi tatalna yulni.

Mayang dukih mayawi baisa kul kayang balna yakat, aslah tinta yamyang balna yakat, kul uni tipni nunuhni balna tanituna balna, kul uni tipni nuhni kal bamak sisitna balna, tingnina mayayana balna yakat, ma tingki sut aslah laidi barakning lani duning ACAI-LA kulni tani adika munah.

Las akat, tinkih lani as kaladi kul uni tipni nunuhni balna laiwi duwi iuwa balna yakat, yulbauwi dawi wayani kaubik yakwa balna yakat (EACEA) Europa kaupak, ma tingki sut laihwak barakning lani yamdi, pa nunuhni dawi sau aika yakat bik, baisa yamni yamning kul tipni nunuhni balna yakat.

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Chapter 1. Virtual Higher Education in the European and Latin American framework

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This chapter illustrates the evolution of virtual education in the 21st Century, reflecting on educational models and analysing current trends as regards the adoption of technology in teaching and learning processes.

Likewise, aspects related to the internationalization and regional integration of higher education are considered, taking as reference the European Higher Education Area, as well as the different Latin American models.

The study considers the evolution of ICT and the characteristics of innovation, quality and accessibility of e-learning applied to formal learning. It also provides the starting point for improvement in the development of skills and abilities, which is reflected in the development of the courses and the graduate programs of the Adoption of Quality, Accessibility, and Innovation in Higher Education in Latin America (The ACAI-LA project)[2].

Keywords

E-learning, Virtual Education, Higher Education, European Higher Education Area (EHEA), Latin American Virtual Higher Education

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[2] ACAI-LA is an international cooperation initiative supported by the European Community, through the Erasmus + program, bringing together eight Latin American and three European universities. More information available on the web ACAI-LA.

1.1 Introduction

1.1.1   Evolution of virtual education in the 21st Century

The evolution of educational models and technological changes (content managers, mobile devices, MOOCs, etc.) generated a twofold change in teaching and learning processes, both at a conceptual and technological level.

It may be useful to supply a description of the meaning of virtual education, given that the bibliographical references offer multiple and complex definitions for this term (García Peñalvo, 2005; Mir, Repáraz Abaiuta, and Sobrino, 2003; Peck and Dorricott, 1994; Rosenberg and Foshay, 2002). However, William K. Horton (2012, p.1-2) defines it in a simple way: "e-learning is the use of electronic technologies to create learning actions". It is a deliberately open definition, which leaves complete freedom to decide how it is formulated, how it is organized and how it results into consolidated educational practices.

According to Gros (2011), current educational practices are centred on the student and consider learning as a social process, offering possibilities for collaboration with other students, for interaction with the learning context under the guidance of teachers and tutors. Thus, considering the parallelism between development and the evolution of technology, the author establishes three generations of e-learning:

- 1st generation: Model focused on materials.

  The main concern is to adapt content and textual material to the web format. The contents are provided in paper format and the supporting technology consists of the use of audio-conferences, video-conferences, and instructional software.

- 2nd generation: Model focused on the virtual classroom.

  It is based on virtual campuses supported by the e-learning managers. Contents are delivered online and students access Internet resources. In addition, technology allows opening spaces for greater communication with students, through forums and virtual communities.

- 3rd generation: Model focused on flexibility and participation.

  The tutor helps the student to manage the information and contribute to the production of new knowledge. The development of mobile technologies and the rapid evolution of social software fostered a change, providing tools for reflection (e-portfolios and blogs),

interactive technologies (games, simulations, online visualizations, etc.) and learning communities.

As it can be seen, virtual education evolved. At the beginning it was almost a mirror of traditional educational methodologies and was focused on technology, while at present it is based on more flexible models integrating multiple approaches, areas and modalities and on the use to the ICT to expand its reach.

Table 1.1. Transformations in virtual education, from e-learning to *i-e-learning*.

e-learning	i-e-learning
Delivers consolidated knowledge	It also generates new knowledge
It is still e-teaching	It is owned by the student
It can isolate the student	It creates learning communities
It is delivered by a single provider or institution	It is the result of and a tool to support the community
Ignores the students' context and previous achievements	It is based on the student's context and previous achievements
Discourages the student's creativity due to the mode in which it is disseminated	Stimulates the student's creativity improving the playful and spontaneous dimension of learning
Reduces the role of teachers and learning facilitators	It enriches the role of teachers as learning facilitators
It focuses on technology and content	It focuses on the quality, processes and context of learning
It is a substitute for class-room based sessions	It is integrated with organizational and social transformation processes
Privileges those who already know	It involves and motivates those who do not have enough knowledge

Source: (Dondi, 2009).

Thus, Table 1.1 allows to identify the differences and the way in which virtual education has evolved since 2000 (Dondi, 2009). The author calls e-learning the first reference of virtual education, while coining the term i-e-learning (innovative e-learning) to identify those educational systems that transformed their strategies, objectives, pedagogical models, organization and management, innovating since 2010.

Dondi clarifies that the "i" of i-e-learning can refer to any of the following characteristics of virtual education: innovative, intelligent, integrative, inter-personal, imaginative, inclusive, international, and of the I (i phonetics), as a representation of the appropriation of learning by the individual.

In addition, virtual education added values such as accessibility, flexibility, and interactivity. Accessibility and flexibility are a consequence of the possibilities for students to study and share learning resources without restrictions of time and space, but it also means that the specific needs of students with different abilities are met. Interactivity refers to the characteristics of materials and resources, the relationship with other students, as well as to communication with teachers (Ossiannilsson and Landgren, 2011).

Additionally, it is important to note that learning can be produced from an e-learning modality or through the combination of several ones. William K. Horton (2012) considers some examples that show the starting point of the different modes of virtual education:

- Autonomous courses: they are followed by a single student, without teacher of classmates' interaction.
- Learning games and simulations: the student learns through simulations of activities that require exploration and lead to discoveries.
- Mobile learning: the student learns from the world while moving through it. It relies on mobile devices, such as phones or tablets, based on conventional classes and performing autonomous learning when they are out of the classroom. In addition, they can participate in learning activities by interacting with other objects and people.
- Social learning: it occurs through interaction with a community of experts and other students. Communication among the participants is supported by social networks, for example online discussions, blogs, and text messages.
- Courses in virtual classes: these are online classes, structured as a conventional course, which includes reading assignments, presentations, discussions in forums and other social media, and completion of tasks.

1.1.2 Trends in virtual education

Virtual education integrates the fields of education, technology, government policies and economy in order to contribute to the development of society, innovating solutions for formal, non-formal, and informal learning.

Current trends in virtual education show that technology, by itself, is not the one that transforms educational paradigms. Thus, the "NMC Horizon Report: 2017 Higher Education Edition" (Adams Becker et al., 2017) reflects on more inclusive education models and improved pedagogies, broadening the trends and challenges that mark the adoption of technology in virtual education, and considering digital tools and platforms as facilitators and accelerators.

The key trends, challenges and technological developments, which will have an impact on higher education from 2017 to 2021, are shown in Figure 1.1.

As can be observed, the trends are categorized in three adoption periods: in the long term, those that have already affected the technological decision-making process and that will continue to be of great importance beyond 2021; in the medium term, those that will continue to be key; and in the short term, those that currently promote the adoption of educational technologies, but that tend to disappear or become common use.

As regards technology, in the short term, mobile learning does not present the same potential as it did a few years ago, while adaptive learning will have a great impact on higher education. In the medium run, this educational method will be integrated in the next generation of Learning Management Systems (LMS), like the Internet of Things (IoT). In the long term, Artificial Intelligence and natural user interfaces (NUI) will respond more directly to human interaction through automatic learning algorithms and devices.

Figure 1.1. Key trends, challenges and technological developments that will have an impact on higher education.

Key Trends Accelerating Higher Education Technology Adoption

	2017	2018	2019	2020	2021

Short-Term Driving technology adoption in Higher Education for the next one to two years

Blended Learning Designs
Collaborative Learning

Mid-Term Driving technology adoption in Higher Education for the next three to five years

Growing Focus on Measuring Learning
Redesigning Learning Spaces

Long-Term Driving technology adoption in Higher Education for five or more years

Advancing Cultures of Innovation
Deeper Learning Approaches

Significant Challenges Impeding Higher Education Technology Adoption

Solvable Those that we understand and know how to solve

Improving Digital Literacy
Integrating Formal and Informal Learning

Difficult Those that we understand but for which solutions are elusive

Achievement Gap
Advancing Digital Equity

Wicked Those that are complex to even define, much less address

Managing Knowledge Obsolescence
Rethinking the Roles of Educators

Important Developments in Technology for Higher Education

	2017	2018	2019	2020	2021

Time-to-Adoption Horizon: One Year or Less

Adaptive Learning Technologies
Mobile Learning

Time-to-Adoption Horizon: Two to Three Years

The Internet of Things
Next-Generation LMS

Time-to-Adoption Horizon: Four to Five Years

Artificial Intelligence
Natural User Interfaces

Source: (Adams Becker et al., 2017).

In this context, teachers' responsibilities are also changing; that is, the challenge is rethinking the teacher's role. A more active role and participation in teaching processes is expected: they must be facilitators of learning experiences, encouraging students to

develop better research habits and to formulate deep questions to promote personalized, contextualized, and learning-based competencies (Dellepiane, 2018).

1.2 The internationalization of virtual education

In the educational landscape, in general, the international documents approved by the United Nations, the Millennium Development Goals (*United Nations*, 2000), and Education for All (EFA) (UNESCO, 1990), emphasized the role of e- learning in the achievement of some global objectives such as permanent education, the internationalization of markets and globalization, e-business, e-government, as well as sustainable development in various economic and social fields.

UNESCO has 23 specific education programs [3] : EFA, education for sustainable development, higher education and ICT in education, among others. Through the higher education program, UNESCO facilitates the development of evidence-based policies in response to trends and changes in this field, fostering innovation in order to meet the needs of education and the labor market.

Thus, the Global Forum on Quality Assurance, Degrees Recognition and Validation in the framework of the international program promoted policies that assure quality learning paying a special attention to mobility and the harmonization of the degrees. In addition, UNESCO, together with the OECD, defined the "Guidelines for quality provision in cross-border higher education " (UNESCO and OECD, 2005) for national authorities, institutions, and providers of higher education, student associations, educational bodies, quality assurance and evaluation bodies, academic recognition bodies and professional bodies.

These global challenges were reflected in the last World Conference on Higher Education (UNESCO, 2009) and in the III Regional Conference on Higher Education in Latin America and the Caribbean (CRES-2018[4]), within the framework of the Centennial of the University Reform in Córdoba, Argentina. Likewise, the conclusions of this last Conference will

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[3] Retrieved on 18 April 2018, from Education Sector Topics on the UNESCO website.

[4] Retrieved on 15 May 2018, from the website of the Regional Conference on Higher Education in Latin America and the Caribbean 2018.

integrate the declaration and the action plan that the Latin America and the Caribbean countries will take to the World Conference on Higher Education in 2019.

The main objective of CRES-2018 was to reaffirm education as a social asset, human right, and responsibility of the State, considering seven fundamental thematic strands:

1. Higher Education as part of the educational system in Latin America and the Caribbean.
2. Higher Education, cultural diversity, and interculturality in Latin America.
3. The role of higher education facing the social challenges of Latin America and the Caribbean.
4. The strategic role of higher education in the sustainable development of Latin America and the Caribbean.
5. Higher education, internationalization, and regional integration in Latin America and the Caribbean.
6. Scientific and technological research and innovation as a driver of human, social and economic development for Latin America and the Caribbean.

This panorama entails an improvement of the human resources, the development of competencies and abilities in the students, beside the adoption of quality standards in Higher Education.

1.3 The European Higher Education Area (EHEA)

1.3.1 Transformation of the European University

The main purpose of the European Higher Education Area (EHEA) was to establish a process of convergence of university education in Europe, restructuring the university system by identifying the criteria and mechanisms that facilitated the adoption of a comparable system of university degrees, enhancing the aspects that make European universities more attractive and competitive internationally and promoting the quality and excellence of higher education.

This process of transformation begins with the Lisbon Recognition Convention (Council of Europe and UNESCO, 1997), which identified the need to actively support the development and adoption of virtual training throughout Europe, at all levels of education and in professional training. With the Sorbonne Declaration (Ministers in charge for France,

Germany, Italy, and the United Kingdom, 1998) and the Bologna Declaration (Conference of Ministers responsible for Higher Education, 1999) important common objectives were agreed for the year 2010. Later on, new declarations were spread, until finally the official launch of the EHEA at the Budapest-Vienna Declaration (Conference of Ministers responsible for Higher Education, 2010).

At present, the EHEA is composed of 49 countries that adopted the ECTS[5] credit transfer system (European Credit Transfer System). This standard, based on the student's personal work (teaching hours, studying hours, preparation of work and practices) was adopted by all the universities of the EHEA and it assures the convergence of the different European Higher Education systems. In this way, the mobility of students, professors and graduates among all the member countries is facilitated, in order to generate exchange programs that ease international mobility in the field of higher education.

The EHEA studies are grouped into three categories:

- Degree: Accreditation to access to the labour market envisaging different professional profiles. They last between three (180 ECTS credits) and four years (240 ECTS credits).
- Master's Degree: Professional and/or academic specialization or initial training aimed at research activities. These are official studies for which you must have a Bachelor's degree and which, in turn, allow accessing to doctoral training. They have between 60 and 120 ECTS credits.
- Doctorate: Specialized third cycle training oriented to research and professional practice.

1.3.2 Quality assurance in the European University

In the dynamic global environment, the implementation of quality assurance processes created some problems and obstacles arising from the different interpretations that countries give of the concept of quality and the functions of the entities that assure it (some evaluate programs, others accredit institutions, there are agencies whose evaluation and

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[5] An ECTS credit equals 25-30 hours of student work. An academic course is equivalent to 60 ECTS credits, provided that the student has a full-time dedication.

accreditation models respond to specific elements of the system, or systemic models in which all the variables are evaluated) (Michavilla and Zamorano, 2008).

This situation becomes more complicated if one considers the evolution of educational methods, the demands derived from different and complex students' profile, as well as the changes that occurred as a consequence of cross-border education.

In this context, in 2005, the European Association for Quality Assurance in Higher Education (ENQA), in cooperation with the European University Association (EUA), the European Association of Institutions in Higher Education (EURASHE), and the European Students' Union (ESU), developed and agreed on a set of procedures and guides that offered a framework of reference for quality assurance. These resulted into The Standards and Guidelines for Quality Assurance in the European Higher Education Area, ESG.

As a consequence of the aforementioned dynamism, quality assurance systems had to be modernized and transformed in order to foster cooperation among them and to establish frameworks that facilitate the recognition of professional qualifications and international mobility. As a result of this, in 2012, the E4 Group (ENQA, ESU, USA, EURASHE), in cooperation with Education International (EI), BUSINESSEUROPE and the European Quality Assurance Register of Higher Education (EQAR) launched a review of the ESG in order to make it clearer, more easily applicable and useful, also widening its scope. The updated ESGs were approved in 2015 by the Ministers who undersigned the Bologna Declaration.

"The focus of the ESG is on quality assurance related to learning and teaching in higher education, including the learning environment and relevant links to research and innovation [...].The ESG apply to all higher education offered in the EHEA regardless of the mode of study or place of delivery" (European Association for Quality Assurance in Higher Education (ENQA) et al., 2105, p.7)

Within the framework offered by ENQA, educational institutions are free to call on any registered body to carry out an external evaluation. The set of validated agencies is included in the European Quality Assurance Register for Higher Education (European Quality Assurance Register for Higher Education, EQAR).

EQAR recognizes the diversity of approaches to external quality assurance and, therefore, is open to all agencies, whether they operate at the program or institutional level, through accreditation, evaluation or audit services.

In 2016, ENQA announced the launch of the working group on quality assurance and e-learning[6], which aims to address the challenges linked to teaching and learning methods based on the ICT. This working group aims to clarify how to better evaluate virtual education by quality control agencies.

1.4 Latin American framework for Virtual Higher Education (VHE)

1.4.1 Analysis of VHE models in Latin America

In order to build a Latin American framework for Virtual Higher Education, a database was made including a selection of experiences focused on university models envisaging training activities based on a wide use of the Virtual Learning Environments, VLEs. Therefore, a research was carried out through specialized portals, meta-search engines, and Google Scholar. In this way, three lists of different sources that allowed the consolidation of a database with 173 institutions dealing with Virtual Higher Education in Latin America were identified to start this plan.

Initially, there was a database of 165 institutions, including the eight universities of the ACAI-LA consortium. This base of 173 institutions included all the institutions regardless of their type, number of programs or their origin. Then, they were categorized, as specified in (Table 1.2).

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[6] Retrieved on 18 April 2018, from the Working group VIII on quality assurance and e-learning of the ENQA website.

Table 1.2. Types of virtual education institutions [7].

Type	Code	Description
Association	(A)	Institution including and representing a group of universities, based on their common interest in a specific mode
Virtual University	(V)	It offers virtual programs exclusively
Distance university	(D)	It offers distance programs exclusively
Web Portal	(W)	Portal devoted to issues related to distance education, virtual or blends
Virtual-Distance	(VD)	It offers two modes: virtual and remote
Virtual-Distance-Face-to-Face	(VDP)	It offers three modes: virtual, distance and face-to-face
Face-to-face-Virtual	(PV)	It offers two modes: face-to-face and virtual
Face-to-face-Distance	(PD)	It offers two modes: face-to-face and distance

Source: Prepared by the authors.

Likewise, 22 records were removed from institutions that did not have online information at the time of the search. 15 that corresponded to associations, consortiums or portals of distance and/or virtual education. In addition, 11 records related to several face-to-face mode courses or related to previous levels (primary and secondary) and another 45 that only registered face-to-face programs were removed.

The data from Colombia was specified, in the number of programs offered, using the National Information System of Higher Education, SNIES. While the information from other

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[7] The classification presented here corresponds to that specifically designed for this project and does not intend, nor be in accordance with all the references, nor become a standard for the classification of the programs offered by Latin American universities. It is possible that, due to theoretical variants, of application in different contexts or of own legislation, there exist other taxonomies on the form (modality) of developing the programs that can vary according to approximations from different ontological approximations.

countries was taken from some portals and the websites of each institution. It is worth noting that, in the case of the Universidad Autónoma de México, blended programs are referred as open mode, and virtual programs are the distance mode.

Internet research was made between the months of February and March 2016. Universities accredited by international organizations were found, while not being accredited at the level of local bodies of their respective countries, or vice versa. Finally, it is worth noting that IESALC has been developing a map of higher education in Latin America and the Caribbean since the early 2000, but it is not available yet[8]. For this reason, a map of experiences in virtual education in Latin America was made[9].

1.4.2 Characterization of Virtual Higher Education models in Latin America

1.4.2.1 Preselected Higher Education Institutions (HEIs)

As explained above, of the 173 HEIs related in the data collection, 15 of them were selected (see Table 1.3) under the application of the following criteria:

- Presence on the web through an institutional portal.
- Existence of a web portal to develop distance or virtual education strategies.
- Evidence of active virtual campus and/or e-learning platform.
- Induction of activities as a Virtual Higher Education project.
- Offering more than three areas of knowledge in virtual programs.
- Offering more than one level of graduation in virtual programs (for example, technical, technological, professional, and postgraduate level).
- Tutoring for students outside the country of origin.
- Obtaining some kind of quality accreditation in higher education with national or international organizations.

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[8] Retrieved on 20 May 2018, from the Map of Higher Education in Latin America and the Caribbean (MESALC) on the IESALC website.

[9] The complete database is available in this repository.

▪ Recognition and experience in the development of distance and virtual education programs.

Table 1.3. Preselected Higher education institutions.

University	Country	Description
Universidad Virtual de Quilmes	Argentina	Public University, established in 23 October 1989. Its virtual modality was established in 1999. The university offers 37 undergraduate courses, 27 are face-to-face, 9 virtual and 1 bimodal. Regarding postgraduate programs, it offers 10 specializations (8 virtual, 2 face-to-face); 11 master's degrees (7 virtual, 1 bimodal, 3 face-to-face) and 3 face-to-face doctorates.
Universidad Nacional del Litoral	Argentina	Public University, established on 17 October 1919. In 1999, its distance education program was created. It offers 22 technical programs, 7 undergraduate degrees and a specialization in the postgraduate modality.
Universidad Autónoma de Bucaramanga	Colombia	Private University, accredited by the National Accreditation Council, founded in 1956, which began in 1998 to build a virtual platform to promote the use of ICT in its program offerings. The university offers 125 programs, of which 93 are face-to-face and 32 in virtual modality.
Universidad Nacional Abierta y a Distancia	Colombia	The university offers its different modalities through distance learning. This public university was founded in 1981. It offers 61 programs, of which 23 are virtual and 38 are online.
Universidad EAN	Colombia	Private university, accredited by the National Accreditation Council, founded in 1967. It offers 105 programs, of which 76 are face-to-face and 29 virtual.
Universidad Manuela Beltrán	Colombia	Founded in 1975, it is a private university, offering 61 programs, 32 face-to-face and 29 virtual classes.
Institución Universitaria Politécnico Grancolombiano	Colombia	Private institution, began its activity in 1980, offers 109 programs, 71 in face-to-face mode and 38 virtual ones.
Fundación Universitaria Católica del Norte	Colombia	100% Virtual Higher Education Institution, founded in 1996 under this precept. This university is private and offers 22 virtual programs.

University	Country	Description
Universidad Estatal a Distancia	Costa Rica	Founded in 1977, public, it offers more than 80 careers, both remote and virtual.
Universidad para la Cooperación Internacional	Costa Rica	Founded in 1994, it is a private university. It offers around 16 academic programs.
Universidad Técnica Particular de Loja	Ecuador	Founded in 1971, private, it offers about 25 distance and face-to-face programs.
Universidad Tecnológica de El Salvador	El Salvador	The Technological Institute of Commerce and Business Administration was founded in 1979, being the basis for the existence of what is now the Universidad Tecnológica de El Salvador. In 1981 that the university was officially born, being a private one that offers virtual education especially to Salvadorans living abroad, offering eight programs in this modality.
Universidad Nacional Autónoma de México	México	It offers, under the open modality, 22 degrees in eight faculties and one school, as well as four specializations in a faculty. In the distance mode, a baccalaureate, 20 bachelor's degrees and four doctorates are offered. Three specializations and three master's programs in six fields of knowledge are also offered at a distance.
Instituto Tecnológico y de Estudios Superiores de Monterrey	México	Private University, founded in 1943, offers 151 face-to-face and 14 virtual programs.

Source: Prepared by the authors.

1.4.3 Outstanding experiences of quality and accessibility in Virtual Higher Education

After the previous pre-selection, and once a literature review was made on aspects related to quality and accessibility criteria in Virtual Higher Education in Latin America, four universities were selected as models showing practical cases of implementation of institutional processes that assure quality and innovation in methodologies, as well as pedagogical techniques that guarantee accessibility in their university programs.

These Latin American Higher Education Institutions are: Universidad Autónoma de México, Universidad Técnica Particular de Loja in Ecuador, Fundación Universitaria Católica del Norte en Colombia and Instituto Tecnológico de Monterrey in México. The following is a list of the main experiences of the universities selected for this study.

1.4.3.1 Universidad Autónoma de México

In the case of Universidad Autónoma de México, what was found mainly concerns aspects such as the quality evaluation and the impact of the use of virtual classrooms in postgraduate programs (Rocha, 2012; Rocha, Maina, and Sangrá, 2013) and its engagement in designing a model for accessibility accreditation in its virtual programs (Bañuelos, Rocha, and Francisco, 2014; Rocha and León, 2012).

1.4.3.2 Universidad Técnica Particular de Loja

This university stands out because of its contribution to significant experiences aimed at the construction of models and frameworks for the design and implementation of virtual learning environments (Piedra, Chicaiza, López-Vargas, and Tovar, 2014; Piedra, Córdova, Barrios, Chicaiza, and Tovar, 2013). In addition, one should also consider the criteria and technical standards of adaptability and accessibility aimed at meeting the needs of university students with some type of disability (Batanero, García, García, and Piedra, 2012).

1.4.3.3 Fundación Universitaria Católica del Norte

This university has made experiences dealing with some aspects of academic improvement and innovation in virtual educational processes based in virtual environments (Restrepo, Preciado, and Bedoya, 2013), its attention to issues such as accessibility envisaging social, economic and cultural variables (González Jaramillo, 2012); the content development aimed at people with special abilities (Lopez, Restrepo, and Preciado, 2015) and, finally, a proposal for an accessibility observatory in education and virtual society (Restrepo Bustamante, Amado Salvatierra, and Argueta Quan, 2015).

1.4.3.4 Instituto Tecnológico de Monterrey

Finally, the experiences of one of the most renowned and traditional Latin American institutions in the field of distance and virtual education, the Technological Institute of Monterrey, Mexico (Martín Pérez, 1999), mainly deals with questions related to the design and implementation of Open and Accessible Educational Resources as elements aimed at

strengthening quality, both as regards undergraduate and postgraduate students (Mortera Gutierrez and Ramírez Montoya, 2010; Pérez Santiago, Ramírez, and Mortera-Gutiérrez, 2011).

1.5 Conclusions

The unceasing need of the human being to improve their education, to meet a continuously evolving labor world, differences among generations, the emergence of ICT in the world of education and the academic offer available by some universities at the different levels of higher education can all be considered as the essential features of these new educational approaches that try to adapt to the needs of these new students.

This is how educational models are currently designed in processes of openness and integration of various technologies and this shows specific trends in their adoption in the teaching and learning processes, mainly when talking about innovation.

In this scenario, both educational institutions and agencies that ensure quality criteria in higher education evolved, in terms of their policies and guidelines, to make Virtual Higher Education not only an opportunity for those who demand unskilled educational processes, but to achieve the integration and, partly, the standardization of some processes that allow to provide quality criteria for all the beneficiaries of this new education system.

This allowed some countries to make progress as regards the higher education models of internationalization and regional integration, such as the European Higher Education Area. This contrasts with the Latin American scenario, where, in spite of the availability of a wide offer of Virtual Higher Education in the region, there still is a lot of work to be done in the transnational consolidation of policies and quality guidelines.

The experiences that were presented in this chapter and the models that were explored provide a reference framework for characterizing a dynamic Virtual Higher Education world that is always aimed at enlarging its coverage by integrating different technologies into innovative pedagogical models always assuring high accessibility and quality standards.

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Chapter 2.   ACAI-LA Virtual campus as a network services management strategy

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The ACAI-LA campus is one of the main results of the ACAI-LA initiative (Adoption of quality, accessibility, and innovation approaches in Higher Education in Latin America), which served as a repository of open and accessible courses for teachers, students, graduates, as well as for the most vulnerable population.

The courses of the Master's program in Accessible and Quality Virtual Education were also taught within this campus.

In this chapter the concepts of virtual campus and LMS (Learning Management Systems) are developed; the objectives, operation, services, sustainability approach, and the results offered by the ACAI-LA virtual campus are also presented as a network service management strategy within the framework of the ACAI-LA project.

Keywords

Virtual campus, accessible open courses, LMS.

2.1 Introduction

In the current field of education, there are new theoretical and methodological assumptions that outline a transformation of the educational system and, consequently, teaching resources and applied technology cannot neglect this need. It requires varied and attractive resources that facilitate access to relevant and up-to-date information, so that the concerned people can find it unified, verified, and reliable.

In order to integrate and promote these resources, we have the option of creating a virtual campus, consisting of a portfolio of services focused on meeting the needs of the academic community (professors, researchers, students, and graduates, among others), as well as other stakeholders in the educational field, interconnecting the university, companies, and graduates. It can be defined as a structure created as a virtual community in which the academic and administrative activities of an educational institution are developed, including training options and integrating all the services offered by the organization.

Based on the above, through the ACAI-LA project (Adoption of quality, accessibility, and innovation approaches in Higher Education in Latin America), a virtual campus was created, facilitating shared university services for graduates counseling, student orientation, labor insertion, and guidance to teachers to incorporate, in their professional practices, methodologies and innovative educational techniques. For this, the project developed an integrated design of a platform that served as the basis for these services and the tools that facilitate the use, personalization, and interaction with the objective of promoting an accessible, innovative, and quality virtual training (Campo, Amado, and Espinoza, 2015).

It is important that, as professionals or institutions devoted to education, the technology and facilities it provides can meet the needs imposed by the knowledge society, and thus face the challenges to design, build, and lead processes that guide the society for the use of innovative services and tools that allow the development of new practices, and thereby improve the results of teaching and learning.

2.2 Virtual campus ACAI-LA

A virtual campus can be defined, according to Ortiz (2007), as "an environment made possible by the new technologies of information and communications, which fully support

the educational, administrative, and social processes of educational institutions". While for Urbina and Salinas (2014): "the expression virtual campus is used to designate different websites available to an educational community, with the ability to provide pedagogical resources and communication and interaction functions". Hence, a Virtual campus is a space that offers a set of technological services to institutions or organizations used for pedagogical purposes.

The ACAI-LA virtual campus is an initiative of the ACAI-LA project. It was created as a training space to transmit to the educational community of Latin America and Europe the different knowledge, experience, and good practices generated by the partner universities that make up ACAI-LA. In addition, this campus is one of the main means for the visibility and dissemination of the actions carried out by the ACAI-LA project.

Since the ACAI-LA virtual campus began offering its services in 2016 to date (June 2018) there have been 2,952 users, among whom are teachers, university students, graduates, employers, workers of companies and private and governmental institutions, who have participated in at least one of the courses offered by the ACAI-LA partners.

2.2.1 Objectives

The objectives of the ACAI-LA campus are:

- Provide open and accessible courses to university students, graduates, and higher education teachers of Latin America for the development of their qualifications, thus favouring their labour insertion.
- Implement a transnational master's network that supports virtual mobility.
- Create network services that support teaching practices of pedagogical innovation, guaranteeing access and permanence of disadvantaged population in the university; that is, population that has some type of sensory disability, economic difficulties or that is discriminated against for reasons of gender or ethnicity.

2.2.2 About the LMS

The support of a virtual campus is based on information and process systems that use the term Learning Management Systems (LMS) (Fernández-Valmayor et al., 2008). According to Ortiz (2007), the LMS allow to "organize and distribute course materials, develop

discussion forums, conduct tutorials, monitoring, and evaluation of students". Castro et al. (2013) defines LMS as "software installed, generally, on a web server (can be installed on an intranet), which is used to create, approve, manage, store, distribute, and manage virtual training activities". The same authors make a classification of free software LMS among which we can mention: Chamilo, Dokeos, .LRN, Moodle, Sakai and the commercial LMS such as: Blackboard, e-ducativa, First Class, and Saba.

The ACAI-LA campus uses the Moodle platform "a learning platform designed to provide educators, administrators and students with a unique, robust, and secure integrated system to create personalized learning environments" ("About Moodle - MoodleDocs"). The campus started during its version 2.7 with improvements in the code for accessibility aspects review. The migration to version 3.5 for August 2018 is in process.

Figure 2.1. Virtual campus ACAI-LA.

Source: Virtual campus ACAI-LA (2018).

Like other platforms, Moodle contains a variety of tools that favour teaching-learning processes that can be classified as shown in Table 2.1 (Boneu, 2007).

Table 2.1. Tools of the platform

Type of tool	Tools
Tools oriented to learning	- Forums - Files exchange (upload and download files) - Support of multiple formats (HTML, PDF, doc, xls) - Synchronous communication (chats) and asynchronous (email) - Wikis
Tools oriented to productivity	- Calendar - Search of courses and forums - News - Update notifications and forum messages
Tools for student involvement	- Work groups - Self-assessments - Student profile
Support tools	- User authentication - Assignment of privileges according to the role of the user - Student registration
Tools for the publication of courses and contents	- Test and automated results - Course administration - Rating tools - Student follow-up
Design tools for study plans	- Compliance with accessibility - Content reuse - Course templates - Customization of the environment

Source: Prepared by the authors, based on Boneu (2007).

2.2.3 Services

The ACAI-LA initiative has a set of services that provide support to the educational community by joining efforts to strengthen the university-company-alumni relationship. Each of the services offered by ACAI-LA has been developed with the aim of promoting accessible, innovative, and quality virtual training. Campus ACAI-LA offers:

- A platform for virtual teaching.

- Basic accessibility review services - Observatory.
- Consultation on procedures to manage certifications of the ACAI-LA network.
- Repositories of tools and virtual learning objects.
- Learning objects for accessibility to disadvantaged ethnic groups as a factor in the consolidation of social cohesion and development.
- Linking company-university-graduates through the use of graduate monitoring strategies and database of job boards.
- Database of institutions that provide distance and virtual education services in Latin America.
- Database of regional higher education networks for Latin American integration.

2.2.4 Repository of courses

In the ACAI-LA virtual campus, different open courses of self-taught training were hosted, with the aim of replicating good practices and success stories towards an Accessible Virtual Education and Society. These courses were created and developed by the partner universities that make up the ACAI-LA project.

The courses that were taught throughout the project are:

- Creating and participating in class, through the model: Inverted Learning.
- Tools and Skills for Strategic Thinking.
- Strategies for teacher tutoring in virtual environments.
- Use of audiovisual resources in learning environments.
- Excel for data management of small and medium enterprises: intermediate level.
- Teacher's digital competences applied in virtual education environments (ACAI-LA).
- Creation of Accessible Digital Educational Materials.
- Introductory Course on Attention and Customer Service.
- Instructional Design Course for the Development of Accessible Virtual Courses.
- Social Network Management and Brand Positioning (Community Manager).

In addition to hosting the above-mentioned courses, the ACAI-LA campus is the main interface for the delivery of the "Master's Degree in Accessible and Quality Virtual Education", a virtual program composed of 15 modules taught by ACAI-LA Latin

American universities, initiating its first cohort in February 2018 with 105 participants from different countries in Latin America.

2.2.5 Approach to sustainability

This section indicates the actions that will allow the campus to be sustainable beyond the end of ACAI-LA project in October 2018. The sustainability of the campus is based on the sense of belonging of the ACAI-LA partners. One of the main resources for campus sustainability is the Master's Degree in Accessible and Quality Virtual Education, which began in 2018, and is expected to continue after the end of the project. It is planned that the second cohort of this master's degree will start at the end of 2018 to guarantee two more years of use on campus. It is important to highlight that the technical staff that supports the campus has been trained to maintain the platform and, most importantly, to continue creating accessible, innovative, and quality content.

Figure 2.2. Results of the virtual ACAI-LA campus
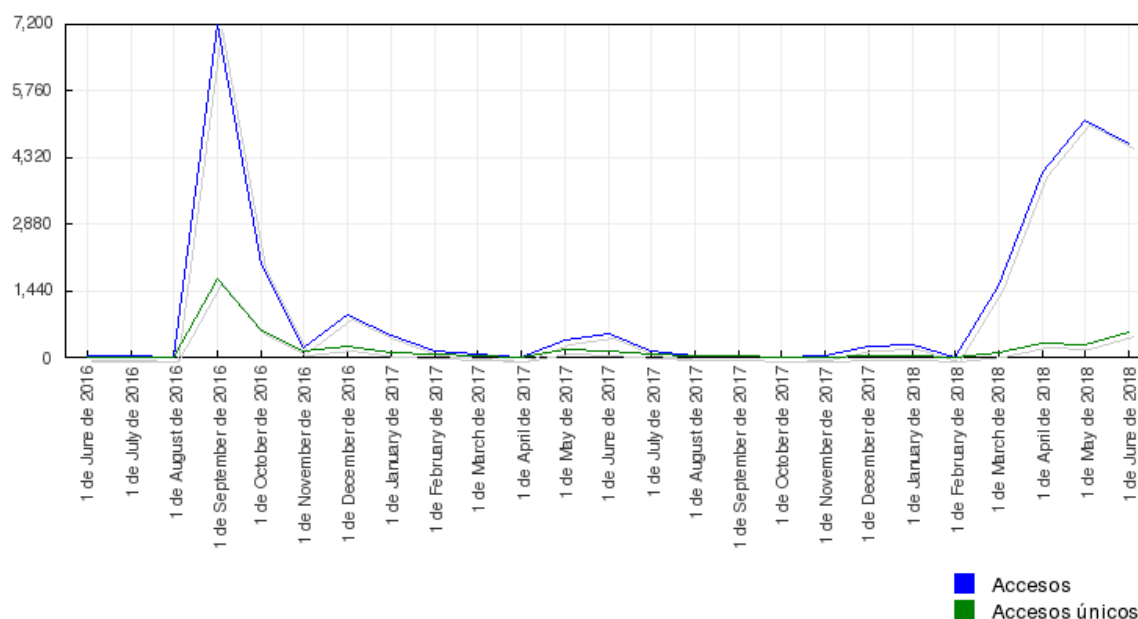
Source: Virtual campus ACAI-LA (2018).

2.2.6 Results

Each year, a greater number of users registered since the campus began offering its services. This evolution is visible in Figure 2.2 in which the average number of monthly visits

is shown (1,122), 184 unique visitors per month. These results have varied by month and increased according to the dates in which the courses offered by the campus in three years have been developed.

2.3 Conclusions

The virtual campus ACAI-LA, since its inception in 2016, trained around 2,952 people, promoting employment through the development of qualifications. The courses that were taught on campus can be characterized as being innovative, open, and accessible, thus reaching the most vulnerable population.

Ten virtual courses were developed by the partner universities of ACAI-LA treating topics of interest for teachers, university students, employers, workers of private and governmental institutions.

The Master in Accessible and Quality Virtual Education is one of the main resources that contributes to the sustainability of the ACAI-LA campus. Likewise, the mentioned program is the one that has maintained the greatest activity and interactivity within the campus.

The ACAI-LA virtual campus services enhanced the University-Company-Graduates link thanks to its repository of courses, tools, and virtual learning objects were implemented throughout the ACAI-LA project.

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Chapter 3.   Quality and accessibility of educational materials in higher education

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This chapter seeks to suggest criteria on accessibility that should be taken into account for quality assessment instruments applied to learning objects or educational resources. It is important to emphasize that a virtual course may be perceived as an ordered and orchestrated set of learning objects. A learning unit in a virtual course is often composed of a large number of resources and learning objects. We must consider the accessibility at all levels, because if accessibility fails in one learning object, this will impact the accessibility perception of the entire course.

The chapter presents a bottom-up approach towards accessibility, highlighting the importance of guaranteeing the accessibility in each of the learning objects in order to generate a positive effect when preparing a completely inclusive course for all.

Keywords

Accessibility, quality, learning objects, inclusion, universal design for learning.

3.1 Introduction

According to the World Bank data (2017), 15% of the world population, namely one billion people, experience some form of disability. This number indicates that the amount of people with disabilities is raising. The reason behind this growth is due to the aging of the population and the global increase of chronic health issues related to disabilities, environmental factors, traffic accidents, or due to violence.

In order to define accessibility, the Spanish Royal Legislative Decree 1/2013 defines universal accessibility as a condition that environments, processes, goods, products, and services must comply with, as well as objects or instruments, tools, and devices, in order to be comprehensible, usable, and practicable by every individual, in the most natural and autonomous way so that they are on equal terms regardless of their disability (BOE, 2013). The characteristics that the elements must fulfil, according to the definition presented above, are: comprehensible, usable and practicable. In this regard, a visually impaired person might have guaranteed accessibility, meaning that a given webpage will load, and the screen reader will be able to read the text. Would the content be, however, comprehensible if an image without descriptive text is shown? Likewise, the example could be extrapolated to a visually impaired student taking a virtual course: each of the educational resources, such as documents, videos, or learning activities must comply with the accessibility features, or else provide with an alternative that allows achieving the same learning objectives on an equal footing.

The right to equal opportunities and treatment is protected by law in several countries, especially the 177 countries that ratified the United Nations' Convention on the Rights of Persons with Disabilities (UN, 2006). Articles 9, on Accessibility, and 24, on Education, are of special importance. Regarding Article 9, its points 2.g and 2.h show the signatories' commitment to take appropriate measures for promoting "access for persons with disabilities to new information and communications technologies and systems, including the Internet", and promoting "the design, development, production and distribution of accessible information and communications technologies and systems at an early stage, so that these technologies and systems become accessible at minimum cost". Additionally, article 24, fifth numeral, states the need to "ensure that persons with disabilities

are able to access general tertiary education, vocational training, adult education and lifelong learning without discrimination and on an equal basis with others".

It is equally worth mentioning the 2012 Paris Open Educational Resources (OER) Declaration (UNESCO, 2012), in which States are recommended, in its section "e.", to pay attention in supporting capacity building for the sustainable development of quality learning materials. More concretely, it encourages to support institutions, train, and motivate teachers and other personnel to produce and share high-quality, accessible educational resources, taking into account local needs and the full diversity of learners. It highlights the promotion of quality assurance and peer review of the educational resources. The OER Declaration exhorts the development of mechanisms for the assessment and certification of learning outcomes achieved through OER.

The Paris Declaration is partly focused on Open Educational Resources; however, the needs expressed in the Declaration could be applied to the elements of virtual training at every level, as virtual courses may use different Open Educational Resources and all the features related to accessibility have a transcendental relevance.

Virtual training or e-learning is currently increasing its presence, not only in HE institutions, but also in Vocational Education and Training entities, in schools, and lifelong learning trainings. Just as physical spaces may have physical limitations, as a University campus, virtual platforms and curricula may present also limitations to people with disabilities. Overall, these obstacles could appear to any person with a temporal limitation dependent on the means in which they access to the virtual platform, and considering the accessibility of simplest resources is essential.

Adopting quality frameworks on every field of life is a trend currently. The popularization of international standards and frameworks for quality management seeks to influence the excellence in all possible aspects of processes and products. Nowadays, it is possible to find a fair amount of quality assessment proposals in educational programmes, and in a lesser amount, applied to virtual training. Regarding quality assessments for unitary elements in virtual trainings, learning objects, or educational resources, it is necessary to have indicators in place in order to assess the criteria that need to be met. The evaluation of pedagogical and technical aspects is part of the assessment tools criteria, being

evaluated by experts and stakeholders from the educational process, carrying out afterwards the required improvements through an iterative process.

This chapter aims to suggest criteria on accessibility that needs to be taken into account in quality evaluation tools applied to learning objects or educational resources. It is important to emphasize that a learning unit within a virtual course may be an ordained and scripted compound of learning objects. The learning unit within a virtual course is usually composed of a significant number of resources and learning objects. We must consider accessibility at all levels, since a single learning object missing accessibility will impact the accessibility perception of the entire course.

3.2 Quality assessment tools for virtual training and learning objects

Currently it is possible to find many definitions about what a Learning Object is. The definition by Wiley (2001) is important due to its wide acceptance, simplicity, and broad scope: a learning object is "any digital resource that can be reused to support learning".

Learning objects are, therefore, a key element in the online learning process. Currently, one of the most widely accepted approaches, in the application of information technologies in education, is based on fragmenting the contents in independent modular units that may be reused in different environments and for different applications – this is what is usually named as learning objects. In a nutshell, a learning object is a digital resource especially suited to be part of courses or other training experiences.

Learning objects published in virtual environments must be accessible and, essentially, they must comply with the specific quality requirements so that everyone is able to take all its advantages. In an online course, it is possible to find tens of online objects – a video, an infographic, a table, a downloadable document, etc. All these elements are placed within the course with a specific aim: to achieve the learning objectives and generate the competences described in the course's teaching guide. The role of the quality evaluation tools is to ensure that learning objects fulfil their mission, and it is extremely important that they are accessible in order to reach all students on equal terms.

On the other hand, digital repositories are used to host any type of digital material. However, digital repositories are more complex when it comes to learning objects, due to the need to take into account what needs to be hosted and how it will be hosted. They may be graphics, simple images or videos, documents, complex exams, or objects groups. Each element must have its own identity and must be reachable – this is the reason why these objects' search criteria must take into account more than their file names, authors, or keywords. There are several standards used to catalogue learning objects in the best way.

In order to assess the quality of the virtual contexts, MOOC courses, and learning objects specifically, many tools may be used. Authors, such as Rubio et al. (2009), Massa (2012), Maldonado (2016), Guzmán, Valeiras, and Campo-Montalvo (2017), Meléndez et al. (2017), have presented a literature review highlighting the different existing quality frameworks. Focusing on the learning objects, there are two main tools – LORI (Nesbit, Belfer, and Leacock, 2007) and HEODAR (Morales, Gómez, and García-Peñalvo, 2008). These are their key aspects:

- LORI – Learning Object Review Instrument. It was designed as a heuristic evaluation tool, based on an expert's criteria, and therefore it does not contain an exhaustive checklist of all its criteria, although it is an excellent starting point.

  The LORI is composed of the following nine critical dimensions of quality: content quality, learning goal alignment, feedback, and adaptation, motivation, presentation design, interaction usability, accessibility, reusability, and standards compliance.

  As is the case with most instruments, they have a manual that provides information on how to interpret each of these dimensions and criteria, including a description with an example, to facilitate evaluator's decision of what factors may influence, assigning a score on a 0 to 4 scale according to the compliance perception.

- HEODAR – *Herramienta de Evaluación de Objetos Didácticos de Aprendizaje Reutilizables*. It is a tool that takes specific pedagogical and technical criteria into account (Morales, Gómez, and García-Peñalvo, 2008). The HEODAR pedagogical aspects are subdivided into psycho-pedagogical and didactic-curricular categories. In addition, technical dimension aspects applied to interface design and navigation design are contemplated. In comparison to LORI, HEODAR contains a more exhaustive evaluation, with scales from 1 to 5 and a user handbook to assign a general score.

In this paper, HEODAR has been considered as the basis for the learning objects' validation, contributing in the technical accessibility component, suggesting best practices to be taken into account based on the type of resource.

3.2.1 Definition of accessible learning objects

An accessible learning object can be defined as a digital resource prepared to be part of courses or other training experiences that meet the characteristics of being understandable, usable, and practicable. Accessible learning objects meet the accessibility requirements by any person with disabilities on equal terms, providing an alternative object that meets the same learning objective, according to the student's means of access. In terms of standards that define the characteristics of accessible learning objects, it is possible to highlight the IMS AfA specification (IMS Global, 2012). The IMS AfA specification seeks the promotion of an inclusive user experience by enabling the matching of the characteristics of resources to the needs and preferences of individual users. The AfA specification consists of a common language for describing:

- A learner's needs and preferences with respect to how the learner can best interact with digital resources, including configuration of assistive technologies. This is represented using the IMS Global Access For All Personal Needs and Preferences (PNP) v3.0 specification;

- Digital learning resources. This is represented using the IMS Global Access for All Digital Resource Description (DRD) v3.0 specification.

- The AfA DRD specification is intended for use in combination with the IMS Global AfA PNP specification, which provides a means to describe how a user desires to access online learning content and related applications. This part of the AfA Specification is intended to describe aspects of digital resources or a computer system that can be adjusted to improve accessibility.

- The AfA PNP specification is intended to meet the needs of learners with disabilities and of anyone in a disabling context. The purpose of the AfA PNP Specification is to provide a machine-readable method of stating user needs and preferences with respect to digitally based education or learning. The AfA PNP specification can be used independently, for example to deliver the required or desired user interface to the user,

or in combination with the Access For All Specification Digital Resource Description (AfA DRD) to deliver digital resources that meet a user's needs and preferences.

The specification targets the following objectives:

- Simplicity and ease of understanding,
- Easy modifiability that will allow changing requirements and the needs of organizations that require some parts of the model
- Easy integration with other metadata and specifications

Analysing the proposed specifications for an accessible learning object allows the teacher, digitizer, and contents' assembler to take into account the characteristics of every different object, seeking at all times to detect possible obstacles that a student with disabilities may encounter.

3.3 Obstacles that a student with disabilities may face in a virtual course

3.3.1 Types of disability and potential problems in a virtual course

Users with special needs and elderly people may face problems accessing website contents – in e-learning this applies to virtual campuses and digital educational resources or learning objects. In order to reach the resources, users make use of assistive technology that ease the interaction process and contents accessibility.

Assistive technology includes devices already available in the market or specifically created, whose function is allowing or facilitating the performance of certain actions – actions that would be impossible or very difficult to be carried out in a given situation by a person without the mentioned assistance. Some of these assistive technologies are screen readers and magnifiers, braille terminals, voice recognition systems, etc. For instance, screen readers (NVDA or JAWS) describes to impaired people what appears on the screen.

Through these assistive technologies, people with disabilities can interact with web contents (provided that they are accessible), without their disability being a barrier to the access to information. This is where our work comes in – how do we guarantee that our contents are

accessible? And, most importantly, how do we design learning activities in which we take into account all students or, at least, give them alternatives to operate on equal terms?

In general, the types of disability are divided into five groups:

- Visual disability
- Hearing disability
- Physical disability
- Language disability
- Cognitive and sensorineural disability

Visual disability

The most serious problems of accessibility, based on the current state of the websites, refer to users with visual disabilities, since most web pages are very focused on visual content. The visual disability varies in its intensity, which may be a difficulty to correctly capture the colours, reduced vision, or general blindness.

The difficulty in perceiving colour (colour blindness) results in a lack of response to certain colours. In this sense, the content designer must not code content or establish actions that are only identifiable by colour. A very common mistake is to set the fields in red of a form as mandatory. This would cause a person with difficulties to perceive colours to have problems when filling it.

To improve the accessibility of this type of users, one must:

- Avoid soft colours because they may be below the limit of vision.
- Make sure there is always a high contrast between the colours of the text and the background.
- Avoid images and background patterns that interfere with reading.

A person with a visual problem is one whose vision cannot be improved to an acceptable reading level without the need of light or magnifiers. There are several types of visual problems such as tunnel vision, loss of central vision, blurred vision, and others.

People with visual disabilities often use magnifiers or screen readers. Likewise, they can use some browsers to increase the font size when the website developer has used relative font sizes for the text on the page.

Blindness implies an incorrigible loss of vision in both eyes. Users with blindness usually navigate with an automatic screen reader (being JAWS and NVDA among the most popular ones), which allows them to go through the information via voice commands or using the keyboard. For this purpose, the content designer must have previously introduced headers of different levels, lists, meaningful links, and alternative texts in the graphic contents, since the screen reader uses advanced technology but it follows a sequence within the document that is being reviewed, and it is not able to guess or infer what is in an image when it does not have a description.

Hearing disability

Sound is, in general, not required to understand a webpage. The accessibility of a website is almost always the same when the sound is turned off – however, this will change in the future with the current tendency to use more multimedia resources. For this reason, the site should be designed having in mind the audience with hearing disabilities.

The hearing disability can be very diverse, from minor hearing problems, to partial or total deafness.

People with hearing difficulties should face few problems with current interfaces for accessing information, since most are based on visual information. The content designer must consider the encoding of alert messages based on sounds and use text messages additionally. It is also very important that the contents presented through videos have audio description, subtitles, and a document with the transcription of the video content so that a screen reader can process it for a person with visual disability.

Physical disability

There are several types of physical disability, which affects different parts of the body, and include, among others: weakness, muscular control limitations (involuntary movements, lack of coordination or paralysis), sensations limitations, joint problems and/or lack of members.

Some people with physical disabilities may have problems performing certain physical tasks such as moving the mouse, pressing two keys at the same time or holding down a key. In a more complicated case, users may not be able to use the keyboard or mouse, so they must use an alternative data entry system. Some of these alternatives are systems based on voice

or movements of other parts of the body, or alternative pointing systems. In the case of content designers, they must use the correct page marking, page break, headers to facilitate navigation within a document and learning objects. In the same way if a person has difficulties to move to a study centre, the preparation of training content at all levels will allow people who cannot move from home to gain knowledge and improve their skills to undertake and lead a full life.

Language disability

Speech disabilities include difficulty in pronouncing in a recognizable manner or with a sufficient sound or clarity level. Difficulties with the language do not usually cause significant problems in access to web information, since access to web content by voice occurs very rarely. However, it must be taken into account that doing an activity where the students must present themselves, or record videos, voice notes may affect them. Alternatively, there should always be an option to send the content written.

Cognitive and sensorineural disability

Cognitive and sensory disability includes multiple disabilities such as dyslexia (a reading disorder that makes difficult a correct comprehension), dyscalculia (difficulty in learning mathematics), attention disorders, decreased intelligence, decreased memory, mental health disorders, or epilepsy, among others.

To avoid problems arising from access to web content by the group of users with cognitive disabilities, it is convenient to plan systems based on simplicity and test them with people facing these issues in order to detect possible problems related to understanding.

3.4 Process of incorporating aspects of accessibility in a virtual course

The main processes or stages established by the methodology for the creation of accessible curricula (Amado-Salvatierra et al., 2015) are in line with the seven processes categories established by ISO/IEC 19796-1 (ISO, 2005). These processes are shown in Figure 3.1.

Figure 3.1. Process model, life cycle of an accessible virtual educational project.
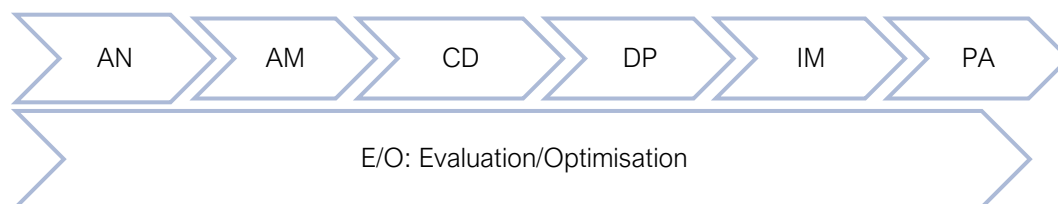
Source: Adapted from Amado-Salvatierra et al. (2015).

The objectives of the processes are the following:

- Needs Analysis (AN): The objective of the needs analysis process is to identify and describe the requirements, demands and restrictions of an accessible virtual educational project.
- Framework Analysis (AM): The objective of this process is to identify the framework and context of an accessible virtual educational project, as well as its planning.
- Concept/Design (CD): This process is about defining and designing the didactic elements of an accessible virtual educational project.
- Development/Production (DP): The objective of the process is to produce the didactic elements of an accessible virtual educational project in accordance with the design carried out.
- Implementation (IM): Its objective is to install and activate educational resources in an accessible virtual training platform.
- Learning (PA): During this process, teaching-learning occurs using the educational resources implemented.
- Evaluation/Optimization (EO): It is a transversal process, which includes all the required activities to perform the evaluation and quality assurance of each of the above processes involved in an accessible virtual educational project.

In the case of accessible learning objects creation, the tasks correspond to the process of development and production. In Table 3.1, general access strategies are compiled by resource type, adapted from the proposals of Valverde et al. (2011). These strategies and recommendations are made based on the principles, standards and conformity criteria from Web Content Accessibility Guidelines WCAG 2.0 (W3C, nd), and applied to education with students with disabilities.

Table 3.1. General access strategies by resource type.

Type	Access strategy
Text	Using semantic mark-up of content to identify the message elements such as: headings, lists, page numbers, and footers. Use at least 11 points of font size and ensure high contrast between font and background colours at all times. Use style sheets so that the final device can determine how the text will be presented. Well-formed HTML and CSS is generally accessible to assistive technology such as screen readers and text readers.
Image	Providing a textual equivalent that can be presented in an accessible format through technical support for people with vision problems. Keep concise descriptions and specify the objective of the image. For complex images it is necessary to describe it using a separate text document available through the attribute: "longdesc".
Audio	Providing text transcripts for audio information, which can be presented in an accessible format.
Video	Subtitles should be placed in the right place, seeking to provide an equivalent experience for people who cannot hear the audio.
Complex	Complex resources, which include applications or interactive content, must contain each of the best accessibility practices for each type of content.

Source: Strategies adapted from Valverde et. al. (2011).

The accessibility level reached in a virtual campus must be maintained constantly by teachers and administrators updating periodically the content and learning material. It is important to highlight that, when uploading a new document, although the virtual campus may have already important accessibility features, this accessibility may be endangered, since a new non-accessible learning object can affect the perception of the student with disability and limit their training on equal terms.

The diversity of available authoring tools is among the difficulties faced by the teacher when preparing learning content in digital format. Hilera and Campo-Montalvo (2015) present a compilation of the basic recommendations to be taken into account in order to seek accessibility in teaching documents, recommendations based on the ADOD project (IDRC, 2010).

The ADOD project (Accessible Digital Office Document) for the creation of accessible digital documents describes a series of recommended techniques for preparing documents with accessible content. The recommendations are based on different authoring tools, without

distinction in payment or free code tools. The recommendations are based on the WCAG 2.0 guidelines for different types of office tools.

The recommendations applicable to office tools are also applicable to PDF documents. The following items are among the applicable accessibility checks in PDF documents and the recommendations of accessibility PDF techniques WCAG 2.0 (PDF, 2012):

- All non-text elements must include an alternative text
- Check background and foreground colour
- Specify the language of the text
- Review the hyperlinks
- Check the labelling and headers
- Alternative texts in the links
- Explain abbreviations and acronyms
- Check the language changes in the text
- Identify decorative elements: headers and footers
- Add bookmarks that allow you to jump to certain parts of the document
- Verify that the reading order by default, according to the tag structure, makes sense, and is consistent
- Check the security configuration options
- If the PDF contains an image coming from a scanned document, it will be necessary to use an OCR (Optical Character Recognition) procedure
- In the case that the PDF includes a form, in the properties of each field a description of the requested data must be specified

In addition to the ADOD project, there are other initiatives and guidelines for the creation of accessible electronic documents, such as IDRC (2010), Sama and Sevillano (2012), and Moreno (2013).

It is important to note that a good way to ensure that a document is accessible is by reviewing it with assistive technology, for example, screen readers or by generating a version of the document in DAISY format. DAISY format is a multimedia structure that maintains and promotes an access system to standard printed documents for blind people, people with low vision, dyslexia, or other problems. Developed by the DAISY consortium in 1996, it is currently based on the definition of the ANSI/NISO standard Z39.86-2005 (DAISY,

2012). The export of content to DAISY format allows to check the accessibility of a document for a person with vision problems.

3.5 The role of universal design for learning in the preparation of learning objects

The term "universal design" was coined by Ronald L. Mace in the late 80s to refer to the design of products, environments, and communication, which can be used by all people, to the greatest extent possible, without adaptation or specialized design, regardless of age, ability or other life conditions. The concept is also known as inclusive design, design for all or design focused on the human being.

Alba (2012) states that, in the same way that traditional architecture design entailed several barriers to many citizens, traditional didactic approaches, based on homogeneous or uniform proposals and on the use of printed materials, are aimed at a large group of students –the one that can succeed with that model–, but do not respond to the needs of many students who may have a type of disability. With this approach, students are those who have to adapt to the established curriculum and, when they cannot, different didactic and material proposals are to be made, tailored to the needs of each student. Something equivalent to the adaptation of the buildings that were designed without taking into account the diversity of users.

In 1984 the Centre for Applied Special Technology (CAST) was created, with the aim of using technology to improve the education quality of students with disabilities, and after years of research they identified a strategy based on the flexible use of methods and materials named Universal Design for Learning (UDL). According to the CAST, the UDL is a set of principles to develop the curricula that provide all students with equal opportunities to learn (Alba 2012; CAST, 2011).

The universal design of learning is based on three fundamental principles in the application of teaching processes, associated with a series of guidelines for their application in educational practice. The principles are the following:

▪ Multiple means of representation: This principle refers to the "what" of learning. Students differ in the way they perceive and understand the information presented to them.

Therefore, we must offer different options to address the content through different perception channels (visual, auditory, kinaesthetic) and, on the other hand, provide information in a format that allows to be adjusted by the student as much as possible. This principle is related to the technical basis, closely related to WCAG 2.0 principles (W3C, nd).

- Multiple means of action and expression: This principle refers to the "how" of learning. Students differ in how they can "navigate" in the middle of learning and express what they know. Therefore, it is necessary to offer varied action options (through materials with which all students can interact), facilitate expressive and fluent options (through facilitators for the use of programs and different material resources) and seek options for executive functions (through the effort stimulation, the motivation towards a goal).

- Multiple means of engagement: This principle refers to the "why" of learning. Students differ in how they can feel involved and motivated to learn. Therefore, it will be necessary to offer wide options that reflect the students' interests, strategies to face new tasks, self-evaluation options and reflection on their expectations, etc.

Within the UDL methodology, the curriculum refers to the goals, methods, materials, and educational evaluations. The goals are the expectations for the students. The methods are the decisions, approaches, procedures and instructional routines used to encourage learning. Materials are the means used to present or represent concepts and knowledge. Evaluation is the ongoing process of gathering information about the student's knowledge, skill, and commitment. UDL represents an approach that facilitates a curricular design in which all students, objectives, methods, materials, and evaluations have a place, on the basis of the diversity. This allows everyone to learn and participate, not from the simplification or homogenization through a single model for all, "single size", but by using a flexible approach that allows participation, engagement, and learning from individual needs and capabilities.

In the designing process of learning objects, it is essential to take into account the three principles of universal learning design, but it is important to provide alternative methods if an element cannot be fully accessible, its alternative can be valid to meet the defined learning objective.

3.6 Conclusions

An accessible learning object can be defined as a digital resource specially prepared to be part of courses or other training experiences, complying with the characteristics of being understandable, usable, and practicable. Accessible learning objects meet the access requirements for any person with disabilities on equal terms, providing an alternative object that meets the same didactic objective according to the student's means of access.

This chapter shares the suggested criteria on accessibility that should be taken into account in quality assessment tools applied to learning objects or educational resources. The present work has been based on the HEODAR tool for validation of learning objects, providing the technical component of accessibility, suggesting best practices to consider based on the type of resource. HEODAR is a tool designed taking into account specific criteria from a pedagogical and technical point of view. The accessibility criteria contributions have generated the ACAI-LA quality and accessibility assessment tool.

It is important to emphasize that a virtual course may be perceived as an ordered and orchestrated set of learning objects. A learning unit in a virtual course is often composed of a large number of resources and learning objects. We must consider the accessibility at all levels, because if accessibility fails in one learning object, this affects the perception of accessibility of the entire course. In this way, a bottom-up approach has been presented, seeking to highlight the importance of guaranteeing the accessibility in each of the learning objects, as it can generate a positive effect to prepare a completely inclusive course for all.

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Chapter 4.   Ecology of virtual education: environments, mediations, and convergences

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The educational experience is set in a particular context, with features and practices of a community of actors that builds its academic life. The emergence of digital and connective technology (DCT) in the educational scene fosters new ways of interacting, building knowledge and challenging academic practices. Therefore, it is necessary to rethink higher education from its foundations as part of a context in which the DCT represents a relational aspect that affects the way in which we perceive and identify, communicate, and produce. It is in this context that a new ecology of virtual education arose, in which the network of resources for the representation of information, communication, and production were expanded.

This article considers the cases of the member universities of the ACAI-LA Network, in particular the virtual education development environments through their institutional management projects for the development of virtual education.

Keywords

4.1 Introduction

We start from considering education, particularly higher education, as a dynamic social practice. The educational experience is set on a particular context, with features and practices of a community of actors that builds its academic life. In this same context, digital, and connective technology (DCT) and its spreading in the educational scenario promote new features as regards how they interact, build knowledge and challenge academic practices. Therefore, it is necessary to rethink higher education from its foundations as part of a context in which technology is no longer something external that one uses, but rather it is a relational aspect that influences the way in which we perceive and identify ourselves, communicate, and produce.

The emergence of the DCT contributed to the emergence of a new cultural scenario that is known as the 'culture of convergence' (Jenkins, 2015), in which a large number of active, participatory, creative, and empowered actors converge with a number of productions of digital content, in virtual environments in which the educational practices of the actors themselves are recognized. We also find a high availability of techno-communication devices through which trans-media narrations flow (Igarza, 2016), stories told through different platforms, which are characterized by the integration of stories and by using different languages with an educational sense.

However, the emergence of the DCT in the communication ecosystem did not necessarily replaced traditional technologies or responded to trends in the last 20 years, but they coexist and mix in very different ways, giving rise to new peculiar forms by the hybridization in their forms and in their speeches.

It is in this context that a new ecology of virtual education arose, initially based on the use of an e-learning platform (LMS system), in which the network of information, communication, and production representation resources was expanded. At the same time new forms of asynchronous and synchronic interaction are recognized, which add potentials to the possibilities of meeting, creation, and appropriation through the academic activity, making the emergence of stories of a new narrative complexity possible.

This article considers the member universities of the ACAI-LA network, in particular the development environments, which are based on DCT and are expressed through their

management projects, as a way to concretize the proposal of virtual education, analyzing it from a case perspective, showing their peculiarities in terms of academic appropriation of digital technologies, proposers of pedagogical practices linked to their actors that are the ones who make virtual environments more dynamic for the benefit of the teaching and learning processes.

4.2 Virtual pedagogical ecologies

We introduce the "virtual pedagogical ecologies"[10] as a category of case analysis that refers to the change that occurred in recent times, in relation to the inclusion of DCT, in educational practices. Ecology (Coll, 2012) since it addresses issues such as: where we learn, when, with whom and from whom, how, what and even for what we learn. These questions were answered almost univocally in the educational system, the same was done by the dissemination of digital learning objects, the multiplicity of modes of interaction mediated by DCT among the educational communities, and the different modes of access to content based on the use of mobile devices. Traditionally, this was the space granted to educational institutions where the process of access and learning of individuals happened, in this sense they are no longer the only places from which socially and culturally relevant content is accessed.

In some way oral/written language (traditional: classes, books, libraries) ceased to be the only way to access knowledge, and other languages and formats for presenting and representing information have been integrated. This new pedagogical ecology challenges formal education institutions, but fundamentally educational actors, managers, members of the educational community, whose functioning responds to a vision of learning that is related to the way in which learners perceive their communication environment (Barbero, 2014).

The DCT shape our actions and can become powerful tools to create vital environments, to configure them, to interconnect our multiple contexts of participation, and also allow us to

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[10] This article recovers the research production of the author M. A. Ambrosino. Research process in the development framework of the Thesis "Transmedia digital narratives in higher education: teaching practices at UNLVirtual". Postgraduate Career in Educational Technology from the University of Buenos Aires, Argentina. 2017-2018.

connect our assumptions about how they work around the pedagogical processes. The use of digital devices in educational practices requires some analysis in terms of their potential, but also limitations for the development of pedagogical micro-practices that can be generated with the incorporation of the DCT.

The transformation of educational practices in this framework has a lot to do with the impact, access, and potential of the DCT, but, above all, it has to do with the sense and pedagogical-communicational purposes that teachers assign (regardless of the fact that they are teachers or managers) to highly-technological educational environments.

In effect, as Coll (2012) points out, one of the main challenges of education, under the assumption that part of a necessary recognition that is still fundamental, but is an educational practice, has to do with a broad vision of education, that is, with the recognition of the importance of the emergence of new agents, new scenarios, and new educational practices that promote the development of people with increasing force and thanks, in some way, to the DCT. Technologies present a scenario characterized by a greater degree of "permeability" among multiple contexts (school and life, school and home, school culture and social culture, education and work, leisure and education, theory and practice, school curriculum and local reality). This generates an interaction among different contexts fostering more knowledge, more relationships, more representations, and forms of construction among different contexts. The current characteristics of connectivity, of the social use of technologies, of mobile or portable devices, our contexts of participation and learning go with us. It interconnects the "voices", the resources, the instruments and the diverse representations of the contexts in which we participate. In effect, technological devices increase the "portability" of practices. We understand that technologies allow us to "carry" the contexts in which we participate in the sense that we can take them with us. Therefore, more and more the shift of the person among these contexts and the management of the flow of knowledge will be an "art" for the one who teaches, for the one who learns, and for multiple educational agents (Bustos, 2016).

The DCT we use to interact in the virtual environment have a dialectical relationship with culture, as Manuel Castells points out, many features of the so-called computer platforms such as connectivity, interconnection, hypermediality, transmediality, porosity, and flexibility, also become cultural features (Castells, 1999). Technology and culture are

pooling dynamically. Communication, access to information, and ways of producing knowledge are redefined. The boundaries between active learning and passive reception become blurred, between roles of broadcast and reception, between literate and digital culture, between access and knowledge construction. Culture opens up its possibility of continuous dialogue in all directions, dislocating its places of production and processing (Barbero, 2002).

However, on the other hand, education has to promote the search for balance between the diversity of a historical and cultural heritage of the institution, the digital culture and the critical formation of the actors of society. Education must take a position between digital "compulsion" and the development of collective intelligence (Levy, 2004).

Higher Education Institutions are in a position where they must sharpen their actions in terms of overcoming the view of the DCT as a support or efficient spreading of information transmission, challenging the discourse of "media stimulation" as a mere consumption of objects (vision that characterizes those media developments based on simple motivation and entertainment). Institutions should develop the capacity to distinguish between the possibilities of digital information technologies, connectivity, communication and production, and the risk of deepening the mere transmission of that encyclopedic information. Higher education finds its limits and possibilities in this respect. On the one hand, fostering learning environments mediated by DCT to democratize access to productivity, citizenship, communication, the construction of knowledge, and the diversification of daily life. On the other hand, mobilizing its own collective memory, historical heritage to promote a digital scenario that recovers the sense of community of practice (Wenger, 2001) beyond the instrumental *technologicalization* of the constitutive aspects of an institution.

In short, these dimensions provide a framework to understand that "the transformation of the ways of reading ... is letting no space for obstinate identification of reading with regard to only the book and not the plurality and heterogeneity of texts, stories, and writings (oral, visual, musical, audiovisual, telematic) that circulate today" (Martín Barbero, 2014). Jesús Martín Barbero points out, rightfully, that digital technology challenges educational institutions in a deeply epistemological sense, because while hypermedia "offshores" knowledge, it mixes it, discontinuously and spasmodically uses it, and subtracts it from

"institutionality" from where is born, the institution remains in the antipodes: messages of long temporality, systematic approach, effort, and discipline. Moreover, digital technology is today the place of "the displacement of the boundaries between reason and imagination, between knowledge and information, nature and artifice, art and science, expert knowledge and profane experience" (Martín Barbero, 2014).

4.3 Environments/media and mediations

In this article, we consider virtual environments as those spaces that represent institutions through the use of techno-communication platforms, which materialize the actions and practices of an academic community.

In the last decades, mediation has been one of the central and most systematic analytical categories in the study of reception and appropriation processes through the media. The theoretical proposal of Latin American expert Jesús Martín Barbero is among the most fruitful and comprehensive, he formulated two key movements: from media to mediations and from communication to culture (Martín Barbero, 2010).

The mediations were defined by Barbero as "the places from which the constrictions that delimit and shape the social materiality and the cultural expressiveness of the media come from", the point of articulation between economic and symbolic processes, the macro and the micro-social, the popular and the massive, production and consumption. Within our interest we can add the dimension of transmedia and education. In addition to the genres, Barbero includes the concept of *habitus* by Pierre Bourdieu to explain the logics that intervene in the social uses of the media. The class *habitus* imply for this author the diverse ways in which the different groups and social classes organize the time and space of everyday life, the social meaning that they give to the media and the type of demands that they formulate for them. Complementing this vision is the Multiple Mediation Model proposed by Orozco, interested in the "operationalization of the process of mediations based on empirical audience research". Although Orozco puts into question the television audience, we find these categories highly adequate, adapting them to the interest of this article focused on educational communities of practice mediated by DCT.

Orozco's perspective (2002) has among its basic assumptions the idea that reception is a highly complex process, in which multiple situational, cultural, structural, rational, and emotional constraints are involved.

This author emphasizes the important role of the media differentiation, which conditions the reception processes. Different technological modalities involve different modes of reception depending on the potential uses they entail.

Mediation is conceived by Orozco (1998) as a "structuring process that configures and reconfigures both the interaction of the auditoriums with the media and the creation by the audience of the meaning of that interaction". He suggests four groups of fundamental mediations: Individual, Situational, Institutional, and Technological, but considers that culture impregnates them all. For him, mediation is a complex and wide structuring process that cannot be reduced to the sum of its components. Mediation is not directly observable and no action or singular meaning constitutes mediation properly. In the same way, we ought to establish the difference between mediation and the sources of mediations or mediating instances (Orozco, 2014). Martín Barbero (2010), in the prologue to the new edition of "From media to mediations", proposed a new analytical map of mediations, which would include the new complexities in the constitutive relations between communication, culture, and politics to face the technological fatalism of the hegemonic project, "against which it is more necessary than ever to maintain the epistemological and politically strategic tension between the historical mediations that endow the media with meaning and social reach and the role of mediators that they may be playing today".

To conclude, this distinction between media and mediations is a key category to consider in the definition of virtual education projects. Designing virtual educational environments from this perspective can reshape the academic actions of representation and on-line interaction of the institutions.

4.4 Contextual Mediating Instances

At this point we can consider some elements to interpret the cultural changes that the technological mediation produces, in its relation both with the macro-structural conditions of the social, economic, and political contexts, and in its specific articulation between said structural instances, the conditions of the context and the actions of the concrete social

actors. All mediations are expressed in particular actors and social agents. The *habitus,* as an integrating category of the different levels and dimensions, is the result of the incorporation of the micro and macro-social to the subjectivity of the individual.

4.5 Virtualization experiences in the field of the ACAI-LA network

We will take the case of the ACAI-LA network to resume its institutional activities, oriented to virtual education, from the category of mediations. Those that derive from the fact that the actors are located in an institution, in a social context and with a history. This perspective distinguishes between micro and macro contexts, which is why the institutional vision is taken as macro and its actions as a micro context.

This section considers the cases of Higher Education Institutions of the ACAI-LA Network that developed virtual environments oriented to online education of virtual education. The object is to gather, in these cases, the institutional significance that virtual environments have. While, at the same time, giving an account of what is the institutional vision and the organizational structure that focuses the projects and actions oriented to virtual education.

In order to strengthen its characterization, the virtual environments that are created as a global institutional strategy were taken on the one hand, and, on the other, those that are configured as support for the teaching and learning processes. In this framework, the type of institution, vision, management scope, platform and/or technological system, type of project or virtual proposal, and the central recipients that are objects of the virtualization strategy are considered.

4.5.1 Universidad Nacional de Córdoba (Argentina)

The university is based in the province of Córdoba, scattered between the University City and the historic center of Córdoba, the UNC –also called Casa de Trejo– has fifteen faculties; two secondary schools; 145 research centers and institutes; twenty-five libraries; seventeen museums; a laboratory of blood products; two hospitals; a blood bank; two astronomical observatories; a natural reserve, and a multimedia communication consisting of two television channels, two radios (AM and FM), and a news portal.

Two lines of development are recognized in relation to the inclusion of virtual environments. On the one hand, the Virtual Campus UNC whose actions are reflected in a portal and mainly contains applications for management. On the other, the faculties, which make up this institution, develop careers in the distance mode. They use different versions of the Moodle platform, customized with the visual identity of the reference academic unit.

The faculties set up the virtual learning environments, organized according to the distance degrees they deliver. They are structured mainly by modules that make up those degrees and other references, such as tutorial spaces for both teachers and students, can be found. On the other hand, we can see that the same Moodle platform is used by organizational structures of each faculty by types of distance and face-to-face studies where distance degrees are organized by subjects, but in the case of face-to-face studies they are organized by courses and departments. Institutional spaces that materialize through the same environment are also identified.

4.5.2 Universidad Nacional del Litoral (Argentina)

Through the UNLVirtual Distance Education System, the University intends to respond to the needs of flexible and continuous training, in a context of increasing value of knowledge and demands for access to training and university specialization. After 18 years of implementation, UNLVirtual became one of the most significant experiences in distance education in the country, with more than 10,000 students throughout the national territory and about 40 university training proposals for undergraduate, graduate, postgraduate levels, and courses. The Secretariat of Institutional and Academic Planning defines its policies and actions related to the development of mediated education through technologies within the framework of the Education and Technology Development Program.

In this sense, the Multimedia Centre for Distance Education (CEMED) is the Management Unit linking with the actors of the campus community.

This Centre provides institutional responses to the integration of educational innovations based on the intervention of technologies in the context of the institution's tradition. The central mission is to provide development conditions for the management and academic units throughout the UNL, through project management methodology.

Since the creation of the UNLVirtual System, the University recognizes the need to strengthen its institutional capacity and support for the modality, defining the Virtual Campus 3.0 as the space of representation and academic activity of the university community. This environment has been designed to develop the academic activities of the UNL, enhancing and expanding the virtual teaching and learning community. The virtual environment that accounts for distance learning is developed under the Moodle platform integrated into a series of academic-administrative management modules. In terms of complementing the synchronous audiovisual interaction, the Virtual Campus has an integrated desktop video conferencing module, supported by the BigBlueButton application.

4.5.3 Universidad del Magdalena (Colombia)

UniMagdalena is a public university of Colombia. Its stated mission is to train ethically-sound citizens, and humanists leaders and entrepreneurs with social and environmental responsibility, therefore in its development plan proposes as one of its key objectives to acquire and implement the use of technology in strategic and support processes, expanding, modernizing and integrating institutional information systems, and promoting the use of information and communication technologies in academic processes.

Its organization includes Vice-rectorates and faculties. Degrees are offered in both modalities through a virtual environment based on the Blackboard platform.

The Centre of Educational and Pedagogical Technologies (CETEP) is set in the framework of the Academic Vice-rectorate. It is responsible for the planning, support, and strategic development of information and communication technologies in academic programs, and at the same time it manages and promotes the use of information and communication technologies by teachers and officials of the institution. For the virtual learning environment, the Blackboard e-learning platform is used, and various free technological tools are implemented in the development of academic programs. CETEP promotes research on technological tools as well. The portal is a space for interaction and is oriented towards the development of training spaces for training and inquiry. The recipients of these actions are, in particular, those of the community of Unimagdalena teachers, students, and administrative staff.

4.5.4 Universidad Católica del Norte (Colombia)

This institution, located in Colombia, is defined by virtual education. It offers a system of higher education based on the virtual, considering territorial development as objects through the inclusion of information and communication technologies to break geographical distances. Another of the objects that are strongly supported is social inclusion and projects oriented to the inclusive dimension. This university offers virtual academic programs in which professional careers and specializations are offered while offering a series of courses within the framework of continuing education.

In organizational terms, virtual centers constitute the University. These centers offer services for students in terms of language training, entrepreneurship, graduate inclusion support, and professional internships. This university has a long history as regards the inclusion of technologies for teaching purposes and has gone through various communicative, pedagogical, and technological environments. Students have a virtual classroom based on the Canvas platform; this platform is used for projects that are specific to Universidad Católica del Norte. At the same time, it coexists with another platform called Elion (UCN own development) through which all the programs from Universidad Católica del Norte are developed. This environment Elion Smart e-learning has an integrated social network system, includes a virtual portfolio where the student's activities are monitored. There is a strong imprint of the community of this institution for the promotion of virtual education through establishing links not only by training programs to achieve a degree, but also other cooperation activities.

4.5.5 Universidad de Alcalá (Spain)

This institution offers study courses in social sciences, including recently fields such as health sciences and engineering. It aims at playing a major role in the international arena. It has official (titles recognized within the framework of the European community) and own studies. Its offer includes degrees, masters, doctorates, and continuous training.

In the framework of the actions of the Institute of Education Sciences, a support service is offered for teaching both pedagogical training, as well as for the development of the non-face-to-face teaching modality mediated by information technologies – this line is called virtual teaching and it includes a Virtual Campus.

The university offers a virtual campus for access to the teaching support space. The virtual classroom is developed based on the Blackboard platform and has the videoconferencing system integrated into the Virtual Campus. The virtual classroom is one of the platforms that is made available to teachers as a support tool for face-to-face teaching, virtual spaces associated with a subject, a group of subjects or the entire degree can be generated. This virtual environment is complemented by Blackboard Collaborate, which is a videoconferencing tool that can be used inside the Campus externally through the web. The recipients of these academic services are fundamentally the professors and students of the university, it is a strategy for the internal community of Universidad de Alcalá.

4.5.6 Universidad Metropolia (Finland)

The University of Applied Sciences focuses its offer on the fields of business, culture, health care, social services, and technology in terms of discovering new ideas and building solutions. This university develops the Open University of Applied Sciences line. This project offers modules of open curricular designs that can be recognized regardless of previous studies. It offers two types of Bachelor and Master Degrees. Although the modules are offered independently, they also have an admission system that includes them into a curricular path that credits them with a degree. The admission system establishes a set of academic and non-academic requirements such as work experience.

The offered modules are available in an online space in which, through a code, a student chooses the course he wants to attend, accesses the study materials, the requirements, and other information that can be found in a study guide. In order to register you must have a home banking user or a mobile device certificate. All the materials for the study, work guides among other resources, are sent by means of an institutional email. The degree is complemented with the Moodle e-learning platform organized according to the open modules offered by Metropolia. Some of the courses offered are 100% virtual and under a modular feature. A teacher, program coordinator or program director is in charge of the modules.

4.5.7 Universidad Galileo (Guatemala)

It is a Higher Education Institution located in Guatemala. Its philosophy is based on the development and increase of competitiveness, its main training activities were initially

related to information systems and computer science. At the moment it counts on a varied offer of human, applied, and technological sciences.

The field that develops actions for teaching with technology is called "*E-learning en Galileo*". This is an area that offers virtual education services and was created primarily to develop digital resources. It offers its studies in virtual or hybrid format, as a combination of virtual and face-to-face training. They are offered on the Google Classroom platform. In other periods they have developed MOOC systems using the Edx platform together with the MOOC Maker project. In 2015 they launched a project for a virtual space for teachers that was called "Virtual community of teachers" that encourages the participation of teachers around pedagogical issues.

4.5.8 Universidad Panamericana (Guatemala)

The Pan-American University of Guatemala is a university that offers all sections of higher education and its proposals are developed through headquarters distributed in Guatemala City and in the country. Among its degrees, it offers the titles of technician, professor, bachelor, master, and doctorate. It offers the three face-to-face, blended, and virtual modalities. It has a Virtual UPANA structure, which aims to work with authors, tutors, and students. These actors participate in the virtual programs offered. Among its most important objectives is to promote and enhance the virtual practice of an educational model to guide the design and implementation of careers and virtual courses. It also offers training and research instances.

The development of the programs is done through the LMS Blackboard platform and this environment is complemented by the videoconferencing system and the possibility of having a repository of educational resources to be included into the educational proposals. This area offers open training for all teachers. It also develops an open offer of courses within the framework of a MOOC Makers Campus in collaboration with other universities. In this sense, the recipients of the virtual programs are, on the one hand, the students of the UPANA careers and, on the other hand, the MOOC campus that gives the possibility to connect with the community in general.

4.5.9 International Telematic University UNINETTUNO (Italy)

The International Telematic University UNINETTUNO has its headquarters in Rome, Italy; it is a private management institution. It offers distance university degrees based on the development of television and the Internet. This university took origin from an agreement with a Mediterranean network of universities in the framework of a project funded by the European Commission aimed at distance education. UNINETTUNO has an organizational structure based on network with a Coordination Centre, Technological Poles, and a Production Centre. The Technological Poles are spread in the national and international territory and provide rooms equipped with information and communication technologies. The production center has the equipment required to produce the multimedia content that will later circulate on the Internet in the Educational Portal. The educational offer is divided by Faculties and the courses are fully offered at distance.

The University has a learning environment defined as Didactic Cyberspace, in which the lessons, the multimedia resources, the exercises, the evaluation system, and online tutoring are provided. Professors, tutors, and authors of the video contents are responsible for the development of the courses. The Internet space is complemented by a satellite television and a videoconferencing system. In addition, it offers interactive classrooms called "three-dimensional virtual classrooms" based on Second-Life. The UNINETTUNO's offer includes a set of MOOCs as well.

4.5.10 Universidad Americana (Nicaragua)

The purpose of the American University of Nicaragua is to contribute to the development of higher education in this country by offering undergraduate courses, while carrying out continuing education programs. Its mains purposes include training of entrepreneurial leaders having a global vision, as the central mission of the UAM. It develops training projects that fundamentally place learning at the center, and it develops flexible academic projects that include new methodologies and resources such as technology for this purpose, even if they are delivered personally. In their mission they recognize that their training activities go beyond the classroom and promote links with scenarios of the socio-productive environment through field practices.

This university has a virtual space hosted in http://virtual.uam.edu.ni/educacion/index.php. It is based on the Moodle e-learning platform that is organized according to the organizational structure in the first instance, and then the courses according to the degrees that are delivered in each academic unit. Each faculty has a space for the development of the subjects of their study plan. In this case, the use of both e-learning platforms and various digital resources in the sense of enrichment and support for the development of strategies that are framed in face-to-face mode is recognized.

4.5.11 Universidad Nacional Autónoma de Nicaragua, León

This university has a Virtual Education Department, being a management area responsible for: research, teacher training and pedagogical mediators, design of virtual learning environments, management of virtual platforms, and production of audio-visual didactic resources. It develops these actions within the framework of the National Academic Program of the Open University in Nicaragua, led by the Presidency of the Republic of Nicaragua, and approved and created in 2016 by the University Council of UNAN-León.

It offers e-learning services to the university members through the virtual classroom UNAN-León based on Moodle technology.

These virtual classrooms are integrated within the degree subjects and other additional training alternatives, such as courses.

The online spaces, based on e-learning, are part of the pedagogical degrees and courses. The subjects are coordinated by each institution, while offering training courses to all community members from UNAN-León.

4.6 Virtual Higher Education in the universities of ACAI-LA

To sum up, we can recognize many elements of the digital technologies in this Higher Education Network. In the cases of the ACAI-LA network, we find a global tendency to customize LMS platforms as a structuring on-line support for the development of teaching and learning processes. Virtual environments are also complemented by platforms to make digital resources available and synchronous audiovisual interaction systems such as desktop videoconferencing.

Although they share many technological features, they implemented them in different ways. Customization in terms of the identity of each of the organizations is a prevailing feature that can be seen the fields of virtual education management.

In terms of customization, three approaches are recognized, in the context of the analysis of the ACAI-LA network:

- Narrative: production focused on the development of the transmedia stories of the teaching team, the imprint is linked to the development of didactic roadmaps, digital educational resources, and audiovisual videoconferences;
- Curricular: focused on the organizer of the curriculum of a training proposal and anchored to scientific and disciplinary traditions;
- Open: customizations of virtual environments oriented to broad communities such as teachers or expanded to public in general

And in general, all cases propose digital technologies that involve different functionalities and uses for communication, information management, teaching interaction, and learning. This trend is also driven and promoted by the wide access with the emergence of Web 2.0 and the identification of the user as a player having power over the construction and distribution of digital content. Among the possibilities that emerged with Web 2.0 or collaborative, and Web 3.0 or semantics, personalization becomes a process not only in the hands of singular single person and a technical action, but the academic community constantly feeds the interpretation of its academic institutional profile.

4.7 Conclusions

Some considerations on these experiences are presented as regards their meaning in relation to the emerging techno-communication platforms, based on DCT, and the conditions on which the customization of environments for teaching and learning operates according to the institutional programmatic approaches.

As a first conclusion, and in the words of Jesús Martín Barbero, education has to be an ideal space to move from media to mediations. Secondly, virtual interaction uses a transmedia virtual environment in which various practices linked to literacy, orality, and culture for images converge. Virtual environments transfer a "communicational condition" (Orozco,

2014) of new type, the virtual interaction shifts between means/applications/platforms and senses. Being a community of virtual practice "means connecting with others and with the other mediated through screens, what makes what we know is not the object itself, but its representation on the screen" (Orozco, 2017). In terms of digital culture, we might think that, in higher education, traditional pedagogical modalities (face and distance) begin to find common ground and pass through a dialectical process of stabilization and destabilization that accounts for pedagogical practices that converge in a transmedial scenario (Igarza, 2016).

The communicational issue crossed by the diversity of screens that replace the knowledge and practices mediated by DCT, make virtual environments a new grammar of Virtual Higher Education. The convergence of DCT and the mediations that happen, that materialize, that take shape, affect the development of the academic culture. Projecting the vision of a hybridized educational environment, in which digital technologies no longer only allow us to represent objects (classic didactic materials) but also the educational relationships that make the pedagogical experience mediated by emerging technologies.

The ecology of virtual education is represented by the conditions of the virtual learning scenario, which result from the confluence of dynamic and changing conditions, combined in a wider academic-pedagogical system than the technological one. These scenarios of virtual education enhance the recognition of cultural, institutional, and social influences that should be considered in the design and planning of strengthening and development of higher education mediated by DCT.

The mentioned references give an account of positive elements useful for the construction of new scenarios, and of pedagogical and technological architectures for the development of teaching and learning processes in virtual education, with relevant and contextualized objectives. The institutional context and the organizational structure include aspects such as pedagogical conditions, disciplinary developments, the communication system, and the technological structures appropriate to organizational projects. According to these visions and conceptions, these mediations act in a flexible, subjective, and dynamic way in the process of acquisition of technologies with an educational sense. The macro-institutional aspect contextualizes and influences, and the micro-pedagogical is structured on the academic players (managers, teachers, and students) and ends expressing itself through

the emerging educational practices. The communication question (Orozco, 2017), which is presented through the convergence of media and mediations, constitutes a central category for understanding the way in which institutions make their decisions in terms of the inclusion of platforms and digital resources; from a double structure: from the meaning and the social actors to the mediating processes and from these again to understanding their meaning.

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Chapter 5.   The Virtual Teacher in the Information and Knowledge Society: Teacher Roles

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The main objective of this article is to give a hermeneutic approach to the role of the virtual teacher and its impact on education as a transformer of it. The article was developed from a visit made by the authors to the virtual teaching unit of the Educational Institution Fundación Universitaria Católica del Norte, which is 100% virtual, and whose ideas are supported by theorists that give strength and which represent its frame of reference. Reading this text, it can be observed that the role of the virtual teacher in the digital age should be aimed at breaking the paradigms set by traditional models, yet without disregarding their history and contributions to pedagogy, but looking ahead towards innovation. Then, it ends mentioning that the virtual teacher is requested to consider the skills demanded by this new way of looking at education, under the mediation of the Information and Communication Technologies.

5.1 Introduction

In order to reflect on the role of the teacher in the digital age, which is being mediated by constantly updated information and by its efficient management, it is necessary to consider four elements that must be taken into account to understand its development: economy, education, culture, and personal development (eudaimonia).

Our ancestors and predecessors learned by transmitting their mutual (experiential) knowledge and they learned through repetition. Later on, when writing arrives, knowledge can be shaped and organized (stone, clay, drawings, or paper). Thanks to this, it can be said that, in one way or another, the first schools were born and these would implicitly have a teacher or tutor possessing the knowledge that they delivered to a group of students, and these, in turn, learned it. In modern times, with the arrival and further development of the industrial revolution, an educational system, that is still in use, was born: preparing workers to organize assembly lines that then, in a linear sequence, repeat the same thing over and over again, just as if they were serial production machines.

Traditional teaching is based on memory processes in which the teacher is the "owner and possessor" of knowledge, and the students (who does not know anything) play a passive role: they must watch, not touch, not move and memorize things according to some instructions aimed at getting a good score or at best, "get to BE someone in life".

However, when the digital paradigm arrives, bringing new challenges and needs, education, as well as its functions, are also seen as a mean to adapt to current paradigms. However, are the current teachers capable of facing the future if they do the same things that were done in the past? Therefore, we need to ask ourselves and reflect on the following aspects: Why are students bored? Why do they come into the labour world having no idea about their talents and abilities? What is the meaning of learning? Is it relevant to study, and if it is, does it need to be formalized inside an educational institution? Is learning or studying in an institution a guarantee of success? Is learning necessarily boring? Do I need a teacher to learn? All this shows that education is still anachronistic and, in some cases, too limited.

But the world changed. There are new paradigms that revolutionize the ideas and concepts we had before the digital age and this leads to the return of traditional education.

Advances in science, technology, and digital development led to the shift from a manufacturing and linear production economy of objects (tangible) to an economy of information, creativity, innovation, and services (tangible and intangible). This modified the learning process and made education a more exciting experience since the learner has to do things, manage information etc. The new roles of the teacher and of education should encourage and enhance creativity, passion, talent, interaction, and connectivity. The digital age is full of new challenges that require new points of view and solutions.

The current teacher is no longer the "owner of a knowledge"; a guide in a teaching-learning process where it manages collaborative and experiential relations and makes the student discover the objective of learning by himself. That is why teaching in the information age needs and requires to engender an aesthetic experience, which must be understood as the possibility in which all the senses of the human being function at their maximum capacity, when they vibrate because of the feelings and emotions spreading around them, giving pleasure and the feeling of being fully alive.

Therefore, the teachers' function in the digital age must be seen as a full-comprehensive, proactive, motivating, and creative process that pays attention to the learning environments in which it is carried out. The scenarios are changing and, therefore, it is necessary to evolve. Teachers' current role goes side by side with the innovation processes that have an impact on what they do and, above all, on who they are and on the whole educational process. Learning takes place in different environments, such as family, friends, workplace, etc. We should make the learning strategies shift from a face-to-face process to more experiential experience. Therefore, the competences of the current teachers should be based on the latest outcomes of research, they should be innovated and their teaching strategies should foster learning processes as well as promote social changes.

The recognition of the role of the teacher as an active player in the teaching and learning process allows us to identify a set of competencies enabling them to be at the forefront as regards the demands of the current society, above all the demands of the XXI Century new technologies, since the use of ICT has a deep impact on the teaching practice that should be based on innovation and creativity, and that should take into account several factors that distinguish it from traditional models; however the teacher's task should not be hampered.

This can be achieved by updating the teaching strategies and methodologies and using the new technologies as new pedagogical tools.

5.2 The teacher and his competences

This is how Gairín (2011) puts it when he tells us that every teacher must have four major skills:

> techniques (knowledge related to the pedagogical task), methodological (linking knowledge with the reality of the student), social (willingness to understand and work together with others) and personal (ethics of the teaching profession) (p.17),

Competences capable of integrating the ICT from a technical, methodological, social and personal perspective; competencies that make your discipline and field of knowledge a structured guide based on ICT skills, that takes account of the student's actual situation and of the implications of concepts, tools and viewpoints, and includes them into the classroom work.

ICT tools must be considered by the teachers as resources facilitating their educational tasks, resources supporting the teaching process and its innovation, and foster practical learning according to actual needs in a perspective that sees digital education as factor involving the student as well as the teachers, making them develop new skills and enabling them to use different tools for the benefit educational progress.

In addition to what said above, it is important to consider the benefits offered by the use of the ICT, as proposed by Barroso and Cabero (2013):

> Facilitate the rupture of the variables of space and time, create new scenographies for communication and interaction of people who participate in the training process, promote ubiquitous learning, combine physical reality with digital, enhance autonomous and collaborative learning, help people with some type of disability (p.13),

These are aspects that, in one way or another, affect the evolution of teaching practice and allow to integrate the use of the ICT, leading to a reconsideration of the teacher's tasks based on new digital skills, of the role of the new digital platforms that should envisage tools for synchronous and asynchronous communication, thus assuring flexibility in terms of times

and geographical locations, beside customized interactions with students in order to overcome space barriers.

Therefore, we ought to highlight the role of the teacher as regards the introduction of the ICT into the classroom and the innovation of the teaching processes, and point out that there should be an appropriate use of the new technologies in the education contexts that promotes analysis, propositions, creativity, evaluation, and updating in order to outline new pedagogical strategies and a reformulation of the tasks of education.

By adopting the ICT, the teacher needs to outline new pedagogies and approaches as regards educational tasks, aspects allowing to design new learning environments, giving up traditional methods and giving way to a more dynamic, cooperative, autonomous, and flexible learning. This enlarges the number of students who can access education and promote continuous education and contributes to the creation of an intercultural and collective knowledge, where the access to up-to-date information is easy and can benefit from the use of the ICT, that should not be limited to the mere access to resources, but it should consider how to apply them to redesign the teaching task and make students active players in the evolution of their societies. This should be fundamental and guiding idea as regards the teacher's tasks. In addition, education should be able to responsibly meet the demands of society nowadays by confirming the role of education and knowledge as means for progress and social growth.

This is the perspective according to which we could consider the use of ICT as regards the teacher's role, as highlighted by Pérez (2014):

> This means that we have to take into account the impacts produced by ICTs and other factors. From the angle of our object (ICT) it is evident that all teachers, at all levels, need an informational culture that involves, not only computer literacy, but also the ability to search, select and interpret information with sources that offer Internet Networks (p.10).

This proves that the teacher can make a massive use of these resources thus enhancing pedagogical methods and including them into the teaching process; this leads to the application of methodologies that allow the students and teachers to play an active role in the educational processes.

Having an easy and continuous access to these resources and cultures allows the teacher to acquire new skills as stated by Ricardez (2016):

> The training of teachers must be strengthened in the following areas: network management, use of multimedia materials, use of peripherals, office automation, and mastering communication and cooperation strategies in technological environments" (p.10).

This has significant impact on the classroom-based teaching process, and the use of the ICT can contribute to make learners acquire knowledge more easily, use new tools and facilitate comprehension, assimilation, and also supplying new innovation scenarios highlighting the role of ICT as an evolutionary factor in education.

5.3 The information and knowledge society

The information and knowledge society calls on teachers to define the role played by technologies in the classroom with respect to the educational and pedagogical models supplied by the educational institutions. We should think about how education, that is being delivered through the new virtual platforms, assures a synergy between itself and the ICTs, and see whether the students and teachers' skills are in line with each other or design new roles that are conflicting or should be conflicting with the unidirectional and individual educational process in which the student and the teacher have a passive role while accessing, handling, and delivering information, in some case disregarding the environments and close backgrounds in which it was delivered.

In the light of what said above, Bozu and Canto are quoted when referring to Drucker who was the first one who mentioned the term "society of knowledge" in his work on the post-capitalist society,

> the need to generate an economic theory that places knowledge at the centre of the production of wealth, producing a change in society, where the basic resource would be knowledge and where the willingness to apply knowledge to generate more knowledge should be based in a high effort of systematization and organization. (2009, p.88).

So "*knowledge*" would imply accessibility to it in all spheres of learning - teaching, leading to the acquisition of it "*for all life*", knowledge becoming a need that breaks the temporal and spatial barriers, that is, contextualized, according to the local or global, to the immediate situation of the environment and context where it will be taught. Therefore, it is a need resulting from the new challenges of the globalization within the educational scenario, caused by the rise of the ICT, which allows knowledge to be spread across a network covering the entire globe, and which meets the demands of the 21st Century, in some way it will contribute to social, economic, political, and educational development in all countries.

> The idea of a knowledge society, as a desirable model for all, comes to recognize the fundamental importance that in all countries has the generation of knowledge and the development of technologies appropriate to local realities, at the same time that it highlights these factors as keys for national development. (Marrero, 2007, p.72).

However, it is then how the teacher becomes one of the actors of the "*information and knowledge society*", whose role would be centred or focused on recognizing the allied ICTs in the training processes of their students, to guarantee that learning-teaching break the old paradigms at the educational level. Some of the perspectives would be:

1. Recognize the role of the actors in the educational process: student and teacher, where training becomes the enabling factor structuring ICT network, in the very process of teaching-learning, becoming a universal education in time and geographical terms, without ignoring the concept of global and universal society.

2. The contents and themes of a course or a specific subject are not the starting point of the educational process, but a pretext to generate new knowledge and knowledge, that entail, enable, or generate learning alternatives in immediate contexts, to address a context and a certain environment.

3. Innovation becomes a requirement in training processes, due to the acceleration of scientific and technological progress, where knowledge is not linear and circular, but rather in the form of a spiral increasing and decreasing, due to the fact that information transcends space and time, "*the network*".

In this sense, the virtual teacher rediscovers the educational processes and faces the changes towards which they are going in the knowledge society by re-reading, re-recording,

and rewriting the historical memory in which they were formed, becoming an artisan that unites and separates points of inflection and breaking of the traditional educational and pedagogical models.

Based on the above, it is expected that the virtual teacher has a more prospective look as regards his own work; that is, when faced with new challenges, he considers that his abilities and skills can no longer be the same as in the traditional system. Consequently, the functions of the virtual teachers in these new approaches involve the inclusion in their training of the global competences of the technological era, where disciplinary and pedagogical knowledge is recognized and valued jointly with the cognitive and human competences of their students and, in parallel, with their own, as reported by Cejas, Navío, and Barroso citing UNESCO (2008):

> The teacher is responsible for designing both learning opportunities and the enabling environment that facilitates the use of ICT by students. It is for this reason that it is essential that all teachers are prepared to offer these opportunities to their students (2016, p.106).

and Cabero and Marín (2014):

> In the virtual classrooms, the traditional methodologies that are carried out in face-to-face classes are being reproduced, using ICT as resources for institutional control of students. According to them, one is moving from a university of the photocopier to a university of the printer (2016, p.106).

In this regard, it is worth noting that the virtual teachers recognizing the potential of ICT in their work or in their pedagogical, didactic, and methodological task, through their classroom (virtual platform), should be allowed to rediscover as the triad "student–content, content–teacher and teacher–student" goes beyond the transmission or interaction of information that comes and goes through a virtual platform. It is then how "the use of ICT depends on the level of appropriation that the teacher has of these to design and implement significant educational spaces" (Coll, Mauri, and Onrubia, 2008, Montes and Ochoa, 2006, cited by Valencia-Molina, Serna , Ochoa, Caicedo, Montes-González, and Chávez, 2016, p.10).

By mastering the ICTs, the teacher makes use of them and includes them into the educational practice and pedagogy, and this is why the concept of competences makes sense in the field of knowledge: conceptual, attitudinal and procedural, and in the type of learning: know, know how to do and value. Navio (2015) quoted by Cejas et al. (2014) argues that:

> having a set of knowledge, procedures and attitudes does not mean being competent. Being competent means motivating resources to be able to manifest. Therefore, the use of them through action exceeds the application of knowledge, procedure and attitudes to specific situations. (p.109)

Consequently, in the information and knowledge society, the teacher is faced prospectively with the demands of the virtual education panorama at an international and national level, where he cannot disregard the challenges that are set by UNESCO, in the Global Education 2030 Agenda, in the framework of the Sustainable Development Goals, and in the Incheon Declaration to "guarantee an inclusive and equitable quality education and promote lifelong learning opportunities for all".

In short, the role of a virtual teacher must promote access to knowledge as well as check whether the ability to transfer and adapt what the network offers to local or regional contexts is assured. Then, in the perspective of this new educational space we should ask the following questions: Is the current educational system addressing the challenges proposed by the Global Education 2030 Agenda, including the use, inclusion, and appropriation of the ICT? Should the existing pedagogical models be redefined when speaking about an education in virtual learning environments? Is it necessary to speak about a new education or is a new concept of education relevant?

In conclusion, virtual teachers are bound to redefine their role in society according to the new demands and prepare themselves for the new competencies of the 21st Century:

> It is necessary to take advantage of information and communication technologies (ICT) to strengthen education systems, the dissemination of knowledge, access to information, effective and quality learning, and a more efficient provision of services "(Cejas et al. 2014, p.8).

Prospectively, this change is already taking place, but we still need to have more flexible understanding about the concept of adaptation and appropriation that will or is still transforming the lives of teachers and students in these virtual learning environments. The way is outlined and the latest research work lead to reflections and analysis about these processes indicating a "convergence" in the teaching functions, based on the assurance of quality education and, therefore, of innovation.

In conclusion, the role of the virtual teacher must shift to the use of ICT, as learning mediating tools, allowing him to become an agent of change assuring the global competencies associated with the demands of the context itself, which calls for a rearrangement of the teaching-learning traditional models, in order to have a role in the globalized world of this century, which changes education and the contexts where it takes place.

5.4 Conclusions

At present, ICTs are a key factor in the evolution of mankind since they are an essential tool allowing teachers to make the younger generations closer to new knowledge, innovation and creativity, promoting relationships where teachers' roles and their specific knowledge are discussed. In addition, it is important to consider the management of tools mediated by ICT, an aspect that, in one way or the other, contributes to the transformation of the context thanks to the cross-field character of the digital resources.

It is important to realize that the ICTs require that teachers meet these challenges and acquire the competencies that allow to identify the different languages born from the digital era, and change the educational setting and its resources, which are more and more part of the classrooms and of the educational environments; and it is up to the teacher to manage them in pedagogical and didactic terms, allowing the use of the digital tools that affect also pedagogical thinking as regards the role of education.

Enhancing educational systems by assimilating the ICTs is important, enabling to disseminate knowledge based on quality and efficiency, promoting better digital services based on the flexibility assured by these tools, getting to know what are the needs of the contexts in which the teacher works and deepen research work and contribute to the construction of significant learning.

Virtual education allows to create great resources in the light of the pedagogical challenges that the teacher considers part of his educational task, relying on a range of possibilities that contribute to promote the art of teaching, in which preparing for this task demands technical and methodological skills; this allows the teacher to use them meaningfully and not hindering the access to ICTs as tools that contribute to the spreading of knowledge, communication and information.

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Chapter 6. Entrepreneurship of Latin American universities

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The increase of competitiveness to qualify for a job in the labour market is a reality heightened in recent times. This situation demands job candidates, in addition to the specific competencies of their field, to strengthen others competencies, such as the use of ICT and languages. This phenomenon has caused universities to integrate entrepreneurship into their curricula, with the aim of developing the skills among their graduates to innovate and propose their own business ideas, which will allow them to generate new job offers.

This chapter presents an analysis of the entrepreneurship and innovation context in Latin America, emphasizing the strategies of ACAI-LA Latin American universities to promote and encourage the entrepreneurship integration into the curricula. The analysis was performed through a documentary review of these institutions' programs and the impact they have had, highlighting among others: incorporation of entrepreneurship curricular components for all careers, entrepreneurship contests, business incubators and accelerators, technical assistance programs for the development of technological innovations, and establishment of networks for projects financing.

Keywords

Entrepreneurship in universities, ACAI-LA, technological innovation, incubation and acceleration of companies, entrepreneurship and innovation in Latin America.

6.1 Introduction

The Global Entrepreneurship Index (GEI) is calculated every year, clustering a series of indicators that determine the level that has been reached in each country. Latin America and the Caribbean area has a very variable performance, where Chile is in first place with 58.8 points, while Nicaragua is in one of the lowest positions with 12.7 points (Consejo Nacional de Competitividad, 2017). When comparing our region with the most developed countries, the data reveals that even the Latin American countries with higher scores still maintain a very low performance related to the entrepreneurship level. Despite this, when observing the percentage of entrepreneurs per country compared to developed countries, Latin America has a significantly higher result (Kantis, Federico, and Ibarra García, 2014).

Figure 6.1. Latin America-Caribbean Performance according to the 2017 Global Entrepreneurship Index.
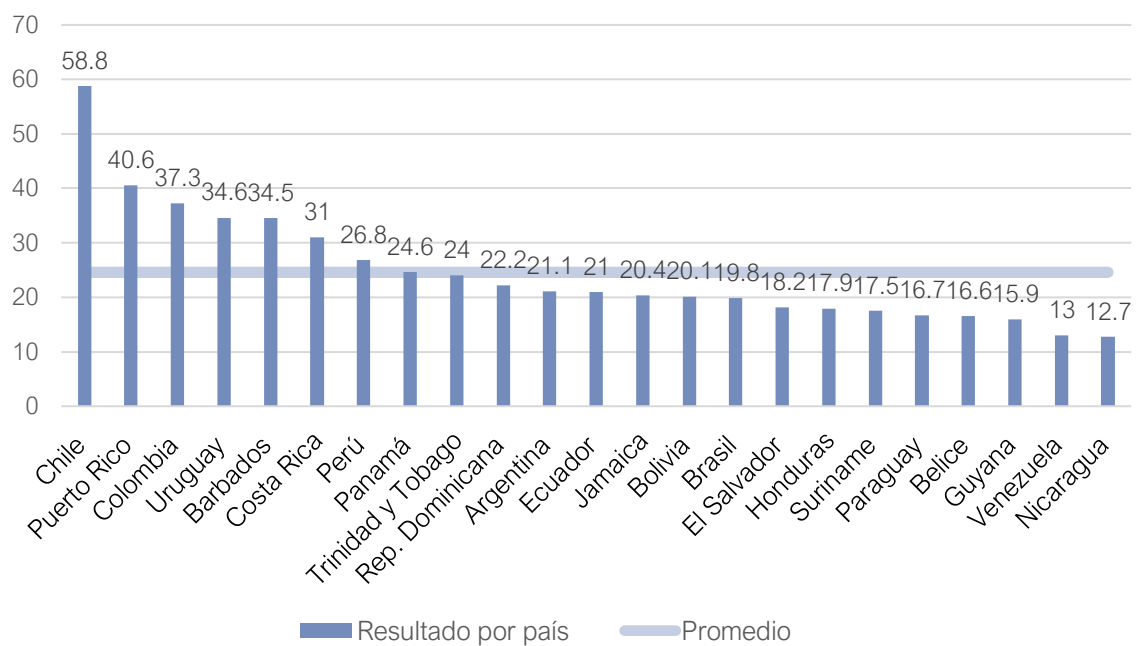
Source: *Consejo Nacional de Competitividad*, 2017.

These results may seem contradictory. In order to understand these data, it must be taken into account that there are significant variations with respect to the type of enterprises and their characteristics, which results in Latin American companies "lagging behind according to their nature". The reason behind this is that these enterprises have a lower number of

employees from their beginning, their growth is slower, and their innovation level is low (Lederman, Messina, Pienknagura and Rigolini, 2014).

Innovation happens to be a key factor in determining the level of economic development and GDP contributions that companies can develop in a country. This becomes a factor that affects the whole region, because despite the existence of many companies, they tend to disappear in a few years or remain as subsistence businesses due to their lack of innovation.

According to Larroulet and Couyoumdjian (cited by Acosta Prado, Zárate Torres and Ibarra Mares, 2014), it is possible to identify three levels of economic development: countries that produce raw materials, countries dedicated to efficiency[11], and countries that have an innovative approach. Latin American countries are distributed among the first two groups, therefore the levels of development achieved are still lower than the countries that are in the third level (innovative approach).

In such situation, the question that arises is why is there a low level of innovation at the companies in the region? The reasons for emergence of new enterprises is a key point to consider when finding an answer: by necessity or opportunity. When analysing the average data of the most developed countries and the Latin American region, the percentage of companies that arise due to the needs of their owners is significantly higher in the region (CAF, 2013) (Moreno Zacarías and Olmos, 2010). While these companies arising out of necessity require less investment, they are also more likely to fail and generate low economic impact for both the owners and the countries where they develop (Figure 6.2) (Acosta Prado, Zárate Torres and Ibarra Mares, 2014).

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[11] Those that have a large number of manufacturing companies that work with economies of scale.

Figure 6.2. Entrepreneurial activity distributed by opportunity and need (2004-2008).
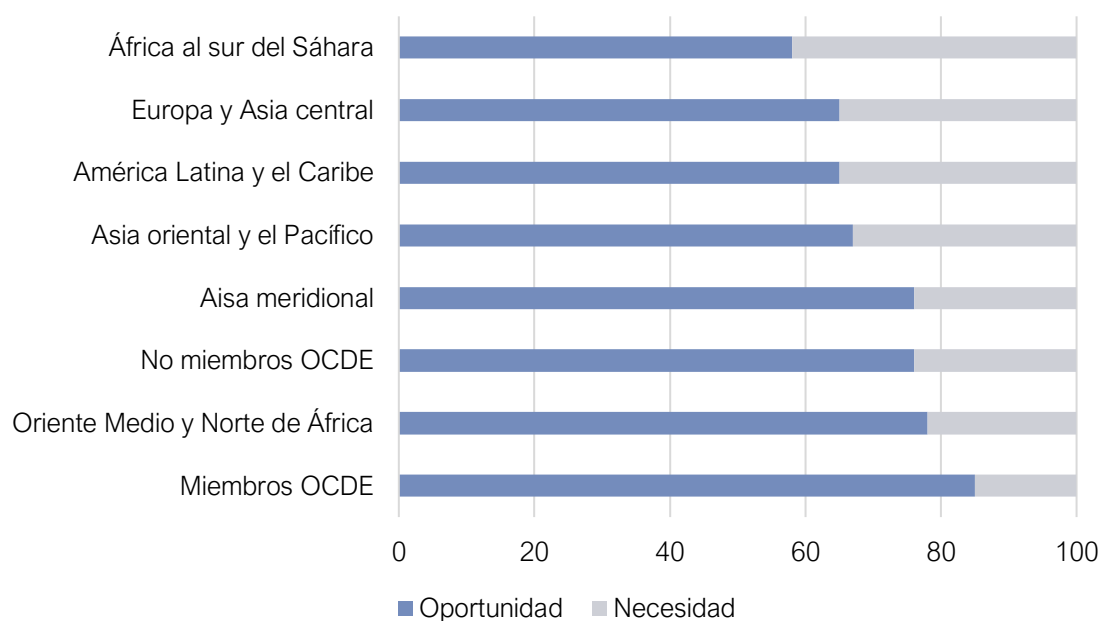
Source: Adapted from Acosta Prado, Zárate Torres, and Ibarra Mares (2014).

6.1.1 University and entrepreneurship

The Systemic Conditions Index for Dynamic Entrepreneurship (ICSEd-Prodem) was applied in 2014[12]. This index uses ten indicators to measure the dynamic entrepreneurship of the countries; the result of the region as a whole was 44,39 on a scale of 100 points, while the average of the three most developed countries on this topic (Netherlands, Finland and Denmark) was 81,84 (Kantis, Federico e Ibarra García, 2014). The two most critical results for Latin America are for CTI Platform and Entrepreneurial Human Capital. In these cases, the role of education is key to overcome the gaps.

A study regarding the characteristics of the entrepreneurs was carried out in Brazil, Chile and Argentina. Part of the results obtained indicated that 1/3 of the consulted people had participated in an entrepreneurship course at the university, and 60% of them affirmed that

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[12] Access to ICSEd-Prodem tool available in Prodem website.

doing it was significant for their enterprise (Kantis, Federico, and Ibarra García, 2014), as shown in Table 6.1.

Table 6.1. Average evaluation of dynamic entrepreneurship in Latin America 2014.

Indicators	Score
Entrepreneurial human capital	23,77
Culture	46,11
Education system	34,21
Social conditions: where do the entrepreneurs live?	32,87
Demand	56,76
Business structure	25,83
CTI Platform	11,20
Social capital	29,61
Financing	27,09
Policy and regulation	38,20

Source: Kantis, Federico, and Ibarra García, 2014.

Universities could have a significant role in the development of entrepreneurship. Courses or subjects related to entrepreneurship issues should be promoted, articulating these actions with research to develop innovations, promote the development of entrepreneurship proposals and connect with business sectors to support their development (Orozco Castro and Chavarro Bohorquez, 2008).

Lagunes Toledo, Solano Méndez, Herrera Avilés, Reyna, and González Tamayo (2014) propose that universities should develop entrepreneurship programs focused on internal and external stakeholders. As shown in Figure 6.3 these programs should include training, business development and research tasks.

In order to be successful in the inclusion of entrepreneurship as part of university's training, it should focus on developing skills, attitudes, and knowledge that lead students to "turn ideas into action" (Kantis, Federico, and Ibarra García, 2014). On the other hand, the relationship that may exist between the university and the business sectors is important, as linking the students with the companies can allow them to know how the industries function, identify the problems that may appear within them, and develop the skills to react to them.

Figure 6.3. Role of universities in the development of entrepreneurship.
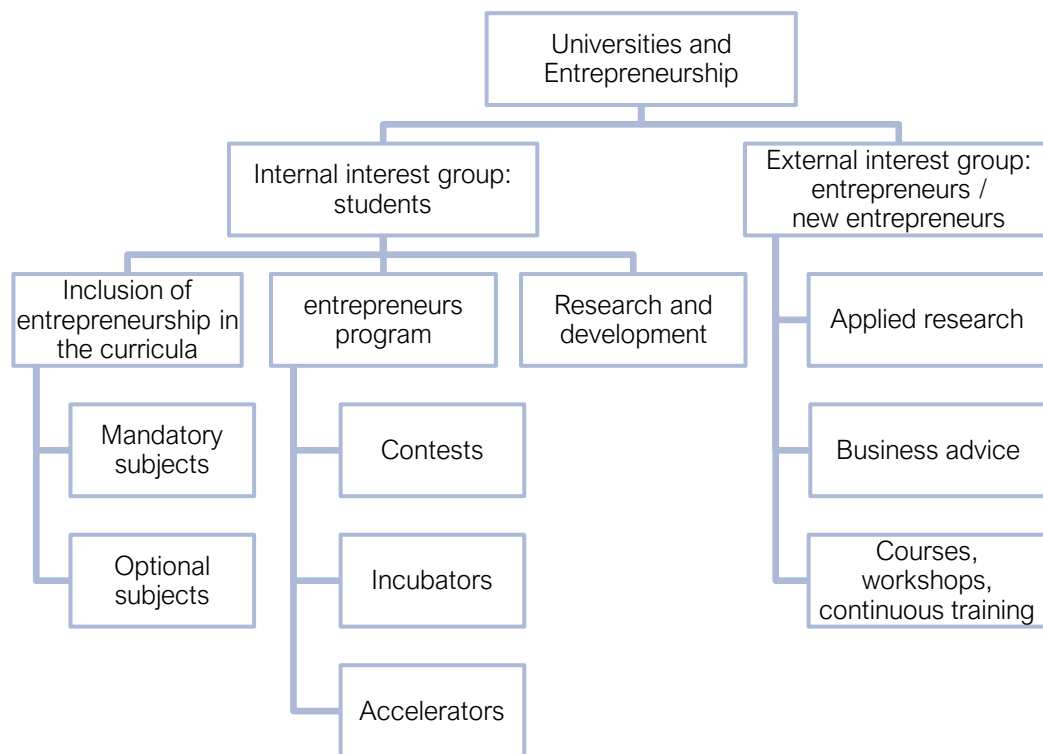
One of the oldest and most successful models is the one developed by the Tecnológico de Monterrey, which was born in 1979 through the project "empresa-escuela" (enterprise-school) and has become a Latin American benchmark as an entrepreneurship program promoted by a University. It consisted in placing the students in real companies during their studies so that they could get experience and apply their knowledge to respond to everyday situations. Subsequently, an optional "entrepreneurship" course was included, which became the "seal" of the University, and provided a path to develop the Business Incubator and Accelerator programs in the following years, which have been replicated in different Latin American universities (González González and López Preciado, 2012).

Figure 6.4. Evolution of Tecnológico de Monterrey in entrepreneurship issues.
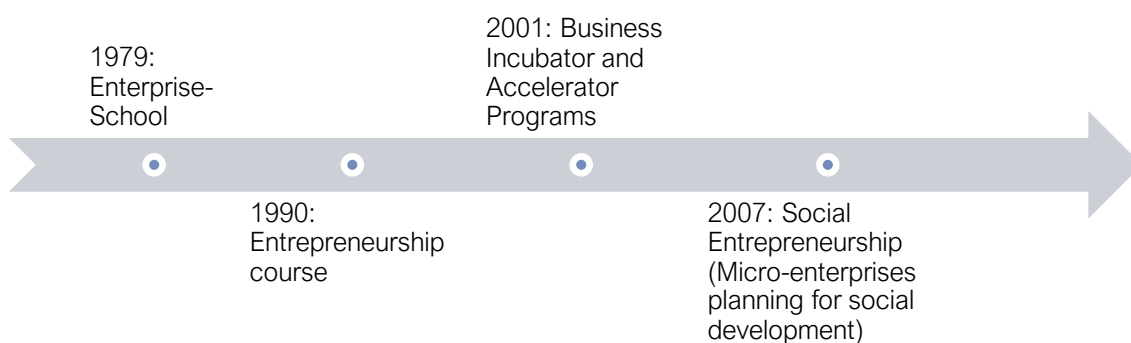
Source: González González and López Preciado, 2012.

6.2 Universidad Nacional Autónoma de Nicaragua, UNAN-León

6.2.1 Entrepreneurship as an institutional policy

UNAN-León has adopted a curricular model focused on "training people with scientific-technical and entrepreneurial skills with a humanistic, ethical and creative sense". Likewise, it has established that this Alma Mater must "train entrepreneurial professionals" that can contribute to the sustainable development of the country in order to fulfil its mission of "transforming and developing society" (UNAN- León, 2018).

The approach established by the university (which aims to develop entrepreneurship as a transversal axis in the training of professionals) leads into actions that strengthen ties and allow a greater approach with business sectors and society in general. After an institutional self-evaluation process for improvement, promoted within the framework of the Law 705, the "society-university entrepreneurship development" was defined as a strategic line, in which several actions were integrated, such as graduated entrepreneurs, the entrepreneurs' women network, diagnosis services and business support, and the PUEDES program (División de Planificación y Evaluación Institucional, 2010).

Likewise, as part of the National Accreditation process, directed by *the Consejo Nacional de Evaluación y Acreditación* (CNEA, 2011), the university has taken on entrepreneurship as the axis of the careers curriculum. To this end, innovation and entrepreneurship topics have been included as subjects in all careers during curricular reforms – in the case

of the Faculty of Economic Sciences they are compulsory subjects, and in the other faculties they are optional subjects.

Table 6.2. Institutional improvement plan. Function: Social projection (entrepreneurship), strategic line 3.2. Developing university-society entrepreneurship

Actions or programs	Expected results (goals)
University Entrepreneurship	University entrepreneurship program promoted
Women entrepreneurs' network	Effective routes identified and disseminated for the provision of business services and economic empowerment. Technological development plan for the women entrepreneurs' network in the Dept. of *UNAN-León* implemented.
Updating and disseminating the diagnosis, advisory and training (DAC) services of the university	Printed and digital material prepared and distributed containing the DAC services offered by *UNAN-León*. DAC services of *UNAN-León* characterized by the demand sector. Monitored the quality of the DAC Services.
Consolidation of the *UNAN-León*/MyDEL Platform for the economic and political empowerment of women in the alliance with URACCAN and the University of Florence, Italy	*UNAN-León* Platform / Women and Local Economic Development (*Mujeres y Desarrollo Económico Local* – MyDEL) consolidated. Institutionalization of the local knowledge laboratory with a cultural identity articulated with the History Centre and the Botanical Garden. Women entrepreneurship and Geographical Information System (*Sistema de Información Geográfico – SIG-UNAN-León*) consolidated. Local knowledge identified, rescued, systematized and disseminated.
PUEDES program	Elaborated business plans according to the established parameters at the national level by all 4 public universities.

Source: División de Planificación y Evaluación Institucional, 2010.

6.2.2 Entrepreneurship and innovation management

To comply with the goals established by the university in its Institutional Development Plan, they created the Office of Entrepreneurship, Innovation and Intellectual Property (E+I+PI UNAN León) in 2015, with the support of the BUILDS project of the ALFA III program. The office is an instance attached to the Research, Postgraduate and Social Projection Vice-Rectorate of the University. This office develops activities such as: successful

entrepreneurs' forums, training for teachers, students and graduates, and strengthening the articulation of entrepreneurship with local and national stakeholders.

Figure 6.5. Hierarchical level of E+I+PI UNAN-León office.
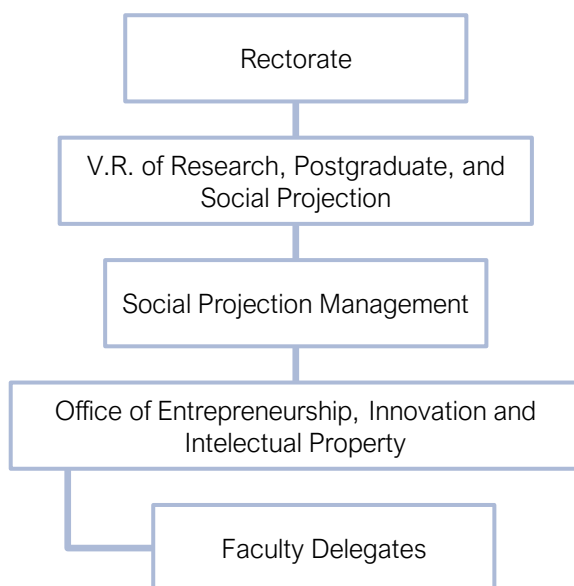
Source: UNAN-León, 2018.

In order to achieve a correct integration and participation between the E+I+PI office and the different faculties of the university, the activities planned and developed by the faculties are executed in collaboration with the "delegates", who are the office representatives in each of the faculties.

6.2.3   Fair of Entrepreneurship

Entrepreneurship as a transversal axis of the university has been implemented since 2010, and consolidated in 2015 with the creation of the E+I+PI UNAN León Office. However, in the Faculty of Economic and Business Sciences there had been significant efforts on this regard prior to this date. One of the most important outcomes is the Entrepreneurship Fair of this faculty, which has been promoted since 2006 and has held already eleven editions.

The fair started by the Student Association with the support of the Faculty authorities. Students are the main participants of the fair, they prepare a "business plan" proposal based on an established format. To strengthen the competences of the participants, university professors give seminars and/or workshops related to the preparation of the business plan.

Teachers, as well as external guests specialized in entrepreneurship or successful entrepreneurs, take part in the evaluation tribunal to decide and award the first three positions.

6.3 Universidad Americana

6.3.1 Entrepreneurship with a global vision, the UAM approach

Universidad Americana is a private university founded in 1992. Since then, it has focused on offering undergraduate and postgraduate university programs that have been highlighted both nationally and internationally. The "Training of entrepreneurial leaders with Global Vision" has been declared as the "main element" of the university's mission, since it intends to train professionals according to the needs and demands of the environment. The university has also established, as one of its cross-cutting themes, "the ethics, global perspective, social responsibility, entrepreneurship, and technology literacy" (Universidad Americana, nd).

6.3.2 Entrepreneurs Program of UAM

Inclusion of entrepreneurship in the careers curriculum

Since 1997 the UAM adopted the Entrepreneur Program model from Instituto Tecnológico de Estudios Superiores de Monterrey de México (ITESM) with the objective of generating competences among its students so that they could face the globalized economy and a highly competitive labour market. Currently, the academic offer of the UAM consists of 20 undergraduate courses distributed in the programs of the UAM and the programs offered through UAM College[13].

Bearing in mind that entrepreneurship is a transversal axis, all university courses count at least with one subject related to the development of entrepreneurship within the students. These programs aim to boost "the creation of their own businesses that contribute

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[13] UAM International Program, all lectures are in English and its degrees have been recognized internationally.

to the economic development and job creation" in Nicaragua (Universidad Americana, 1997).

Business exhibition

At the end of their entrepreneurship training, the students present a business project at the "Business Exhibition of the Entrepreneurs Program", which has been held since 1997, by the end of the first semester of the year. The awarded projects receive cash prizes and represent the university at the International Entrepreneur and Business Incubator Congress of the Instituto Tecnológico de Estudios Superiores de Monterrey de México (ITSM) (Universidad Americana, 1997). Several companies have been born from the results of this fair.

UAM is a pioneer including entrepreneurship as a transversal axis in all the degrees it offers. Another key aspect in the model of the university is the approach the entrepreneurship concept; business entrepreneurship is not the only mentioned model, but "Social Entrepreneurship" is taken into account, where projects have also been presented in "global entrepreneurship events in the Netherlands, Canada, and Singapore" (idem).

Social projection: Entrepreneurs Program

Through the Entrepreneurs Program of the University, various business incubators projects have been carried out in which the students of the university participate (UAM, 2018): (UAM, 2018):

- Capacity model for tenants and owners of the stores from Metrocentro Shopping Centre in different topics of business management. Nicaragua, 2011-2014.
- Promote the entrepreneurship culture and University-Enterprise cooperation for the development of Central America, co-financed by the European Union through the ALFA III program, 2012-2014.
- Implementation of social and labour integration aiming at the development of young people at risk through entrepreneurship training and the implementation of business plans, financed by the Interchurch Organization for Development Cooperation (ICCO), The Netherlands, 2014-15.
- Deepening of entrepreneurial education, proposing new methods of practical training and study of real cases in collaboration with the manufacturing sector, introducing a

system of double coaching (academic-productive) and a program of Assisted Management focused on Entrepreneurship, 2016 -2018.

- Improve business opportunities for entrepreneurs, based on research.
- Promote the resulting services in HEIs (Higher Education Institutions) and the strengthening of the innovation ecosystem in Central America, 2017-2018.

6.4 Universidad Galileo

In 1977, the project "Institute of Computing and Computer Science" of the Escuela Universitaria en Ciencias de la Computación was created, attached to the Universidad Francisco Marroquín. By the year 2000, the faculty became Universidad Galileo, with the approval of the CEPS Higher Education Council (Universidad Galileo, 2018).

6.4.1 Business development projects

Universidad Galileo is involved since 2013 in the "Comprehensive Development Program for Entrepreneurship, EMPRENDE" promoted by the Ministry of Economy of Guatemala, which housed more than 100 entrepreneurs at the university campus to support the creation process and start-up of business ideas or young companies, in addition to financing 35 business plans with non-reimbursable seed capital (Universidad Galileo, 2013). From this experience, the university has developed several projects focused on the promotion of entrepreneurship, both internally with their students and as part of the Social Projection of the University.

Business models competition

This program focuses on fostering the process of building business models and technology business prototypes. It targets the students from the Faculty of Engineering, it has a duration of 5 months of mentoring and networking, and it culminates with the project presentation. The main objective is to develop entrepreneurial skills in students of their final year at the university (Flores, 2016). This contest takes place in only one of the nine Faculties; in this sense, the development of competences identified and proposed by the Faculty of Engineering to encourage entrepreneurship among its students is not extended to the entire university.

Beyond the lemonade stand

Through the customer development methodology, this program focuses on awakening interest in entrepreneurship to students, between 15 and 18 years old, in schools in Guatemala City. A 3 weeks mentoring program is implemented for the development of prototypes and business plans, and at the end of the program they validate and test its operability (idem.). Although this program does not aim to develop new businesses, it offers a space in which young pre-university students can develop skills that allow them to become entrepreneurs, particularly in areas of technological innovation.

Postgraduate in entrepreneurship and technological innovation

Since 2014, Universidad de Galileo offered the postgraduate program in Entrepreneurship and Technological Innovation, which lasts one year, in which a business idea is developed and carried to the launching stage, connecting the entrepreneurs with stakeholders and key figures for their support (networking).

Figure 6.6. Postgraduate in Entrepreneurship and Technological Innovation

Source: (UGAL, 2018).

The objective of the program is the "superior training of professionals, leaders, entrepreneurs and founders of technology-based organizations, providing students with understanding and skills in key areas and skills necessary to start successful and innovative companies" (ibid.).

An important element to be highlighted in this program is that it does not focus only on developing entrepreneurship skills, but also accompanies its participants to take the initial steps in the development of their "new business proposal".

6.4.2 Intellectual property policy and technology transfer

Given that the university's entrepreneurial approach is directed towards technological innovation, in addition to promoting the "use of science and technology for the solution of national problems", the institution elaborated the Intellectual Property and Technology Transfer Policy, which it focuses on providing a clear normative framework on the results of innovation and university research (Universidad de Galileo, nd). This policy covers the results generated by teachers, students and administrative staff of the university, determines the patrimonial and moral rights of the parties and the use of said results, which is important at the time of developing prototypes, which will be part of projects of business presented by students.

6.5 Universidad Nacional de Córdoba

Universidad Nacional de Córdoba has its origin in the early seventeenth century, in the Colegio Máximo founded by the Jesuit Congregation. In the year 1791 the Faculty of Law and Social Sciences was founded, "ceasing to be exclusively theological". It is the first university in Latin America that achieves university autonomy; in the twentieth century other faculties were founded. The Escuela Superior de Lenguas and the Escuela Superior de Comercio "General Manuel Belgrano" (UNC, 2018) were also created (UNC, 2018).

6.5.1 Business incubator program of the UNC

The Business Incubator was created at the Universidad Nacional de Córdoba on 21 April 2015, with the objective of "promoting the creation of new companies in technological bases". Prior to the development of this initiative, the university had experiences supporting the incubation of companies with the municipality and the Universidad Tecnológica Nacional

Regional de Córdoba; at this time the Foundation for the Incubation of Companies (Fundación para la Incubación de Empresas, FIDE) was created. In 2008, the university founded the Scientific-Technological Park with the aim of fostering Technological Innovation, where spin-off enterprises are developed with the support of the Ministry of Science and Technology of the Nation, from which innovative products and services emerged from the students (Universidad Nacional de Córdoba, 2015).

The objectives of the Business Incubator Program of the Universidad Nacional de Córdoba are: promoting and favouring the transfer of technology, to integrating the scientific and technological research activities of the UNC with the activities of the productive sector, favouring the transfer of R+D+i services that enterprises wish to carry out in collaboration with the UNC, and encouraging the creation of technology-based enterprises (EBT) that favour the emergence of wealth and employment.

The program divides its activities into two levels:

- Promotion and support tools for the creation of EBT: call for techno-entrepreneurs, and pre-incubation and incubation processes.
- Entrepreneurship promotion tools: Open Chair in Entrepreneurship and UNC Innova Annual Exhibition.

Business incubator

The objective is to promote the creation of new technology-based enterprises taking the knowledge generated in the university environment. Ten enterprises, currently operating, have been born and established due to this incubator (UNC, 2018). The steps for the development of the incubation of companies are followed as shown in Figure 6.7:

Figure 6.7. Incubation development process in UNC.
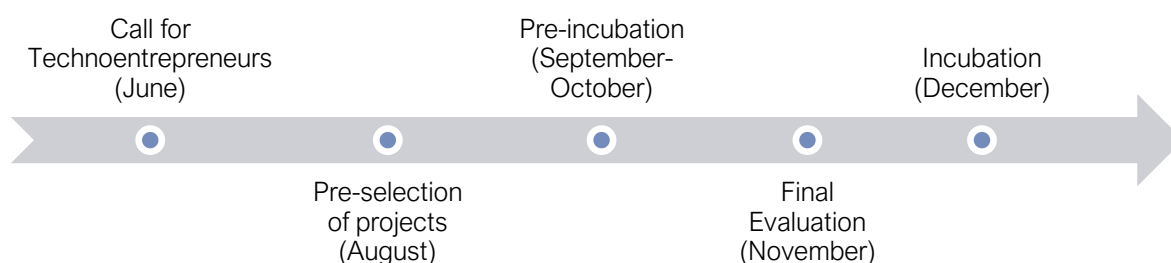
Source: Incubadora de Empresas UNC, 2018.

Open Chair of Entrepreneurship

The Open Chair of Entrepreneurship is a space targeting students, graduates, teachers, non-teachers and researchers of the university, in which seminars are given on topics such as business modelling, trends, methodologies, team management and communication, among others (UNC, 2018).

- Why start? The entrepreneur's profile. Entrepreneurial ecosystem
- Trends in business ideas and innovation
- Design Thinking for innovation in entrepreneurship
- Entrepreneurship plan and agile management methodologies
- Management of entrepreneurial teams
- How to communicate efficiently?
- Elevator pitch workshop

Faculty of Economics

Despite being the focus of the Business Incubator Program aimed at technological entrepreneurship, the Faculty of Economic Sciences has made efforts to promote entrepreneurship and develop self-employment capabilities. For this, it has a range of courses in the area of Creation and Management of SMEs shown in Table 6.3 (Facultad de Ciencias Económicas UNC, 2018).

Table 6.3. Courses in the area of creation and management of SMEs, UNC

Course	Objective	Content
Creation of micro and small enterprises	Training on required tools, knowledge and skills for the creation and formulation of business plans for micro and small enterprises, producers of goods or services and, screenings of new ideas for existing businesses.	- The company and the entrepreneur - Business idea and diagnosis - Economic financial analysis - Marketing analysis - Formulation of the business plan

Course	Objective	Content
Business management for entrepreneurs	Guide for the business strengthening. Learning the business model. Provide elements for business management. Facilitate the access to the entrepreneurial ecosystem.	- Business diagnosis - Accountability analysis and interpretation - Business model and marketing strategies - Strategic and operational planning - Management and business ecosystem
Decision making strategy	Transmitting methodological tools and technical knowledge to address strategies for decision making within the company, in response to the need for these institutions of increasing their competitiveness.	- How to estimate and project the demand - How to calculate costs - The analysis of profitability and the fixing of prices - Financing of the company through the market capital - Tools for management: find the optimal point - The strategic planning through the Lean Canvas methodology
Introduction to advisory of SMEs and family businesses	Raising awareness of the importance and significance of the family businesses. Knowing the details, challenges and differences of professional approach in a family business Guiding and providing basic tools for the insertion in the area of independent consulting Contacting entrepreneurs to meet their needs and demands	- Introduction to consulting and self-employed profession - Dynamics and characteristics of family businesses - Family business diagnosis - Introduction to the family protocol - Management of family human resources - Labour aspects between the family and the business - Case studies of family businesses - The management of relations between the advisor and the family business
Innovative social entrepreneurship workshop	Promote the development of innovative social entrepreneurship that generates a positive social impact in the environment.	- Analysis of the entrepreneurial culture - Business models for innovative social projects - Implementation of business models for social enterprises - Presentation and evaluation of projects

Source: UNC Faculty of Economic Sciences (2018).

6.6 Católica del Norte Fundación Universitaria

Católica del Norte Fundación Universitaria is a 100% virtual institution that was created on 20 May 1997 and whose hallmark is the open knowledge that contributes to the integral development of human beings (Católica del Norte Fundación Universitaria, 2016).

6.6.1 Virtual Entrepreneurship Centre

This Centre is part of the spaces developed by the Católica del Norte and aims at promoting entrepreneurial culture within the university community, developing entrepreneurship skills by strengthening the professional profile of graduates, and create new businesses, all with a focus on corporate social responsibility (Católica del Norte Fundación Universitaria, 2016).

Activities developed by the Virtual Centre for Entrepreneurship

- Innovate: Contest aimed at young adults who are active students in formal educational programs in Medellín and the Metropolitan Area. The purpose is the students to develop projects that provide answers or solutions to social and environmental problems within their community. Two editions of Innovate have been developed (2015 and 2016).

- Business and innovation wheel: Space in which State, industries and universities representatives meet. The objective is to connect challenges, opportunities, and solutions to particular problems, being a space for networking, offering training programs and validating prototypes and/or business proposals; 11 editions have been made. In spite of not being an activity organized directly by the Católica del Norte, it promotes the participation of its university community in this important space for the promotion of entrepreneurship skills.

- Virtual business exhibition: A space in which university entrepreneurs can showcase their business projects or consolidated companies to serve as exchange space, creating networks, and a space where they can receive feedback to further strengthen their enterprises and networks. Every year the enterprises are assessed by specialists, and the best projects receive as a reward an accompaniment from them. By 2016, four business exhibitions had been made, with a total of 26 projects submitted in this period, distributed in 21 community projects and 5 invited projects (UNC, 2018).

- Virtual consultancy: It is a space where members of the university community can receive free advice in the following areas: formulation of their business opportunity, business plan, business implementation and business strengthening. With the opening of this virtual consultancy, it is possible to promote the development of businesses created by the members of the university community, thus achieving a step beyond the simple development of entrepreneurial skills. There are no data regarding the number of companies developed thanks to virtual consulting, an analysis of the impact of it is yet to be performed.

6.6.2 Virtual Course: Entrepreneurship and Innovation

The Universidad Católica del Norte developed the proposal of a course focused on entrepreneurship and innovation, whose main objective is "proving, based on the scenario of entrepreneurship and innovation in the production forms, the emergence of a local economic development from within, from the potential of human, technical, and financial resources of the territory" (Católica del Norte, Fundación Universitaria, nd).

6.7 Universidad Nacional del Litoral

6.7.1 Business development program

Universidad Nacional del Litoral manages the Entrepreneurs Program, developed to promote the creation of companies with innovative technological and productive base, having as a result more than 50 companies that have gone through the incubation stage and more than 2,500 trained entrepreneurs. Some of the tasks that are applied through this program are: training, counselling, incubation, acceleration and finding projects funding.

Jornada Internacional de Jóvenes Emprendedores, JIJE

JIJE is an annual event organized by Universidad Nacional del Litoral and Federación Universitaria del Litoral, whose objective is to generate innovative projects, create multidisciplinary teams and train entrepreneurial skills. It is also a space for exchange and establishment of contacts that allow the promotion of business ideas and/or operating companies. This university's initiative has held twelve editions. In 2017, 40 business ideas and 21 business models were presented.

Training for entrepreneurs

Several projects have been developed in order to strengthen entrepreneurial skills among students and the campus community of Universidad Nacional del Litoral:

- Workshop on entrepreneurship skills: optional course for all students of the university that pursues the goal of "knowing, observing and analysing" various tools to be able to execute a business idea.
- Entrepreneurs' laboratory seminar: optional course for students of all degrees, to provide tools for the development of sustainable entrepreneurship.
- Summer courses for entrepreneurs: various courses are developed, covering topics such as: brands registration, tax aspects or how to present the entrepreneurship to investors. These courses are aimed at both members of the campus community and external public.

Offices for entrepreneurs

The offices for entrepreneurs are spaces physically located in the faculties and university centres of Universidad Nacional del Litoral. In these spaces the campus community members will receive support to promote their business ideas through a pre-incubation process consisting of: tutoring, advices provided by UNL professionals or third parties, access to infrastructure services, training in general and specific topics, and discounts and other benefits granted by the sponsors of the UNL.

Financing for entrepreneurs

Universidad Nacional del Litoral supports the campus community members and external public through contests and/or calls for proposals of business, including joint financing programs with various government institutions, NGOs or private businesses with which a cooperation agreement is signed.

IDEAR Incubator

IDEAR is a business incubator founded by Universidad Nacional del Litoral and the Municipality of Esperanza. It provides: facilities, services, human resources, continuous training, promotion spaces, external financing, institutional support, and intangibles resources. There are 21 graduated businesses and 10 companies in the incubation stage (IDEAR, 2018).

Due to this program, Universidad Nacional del Litoral developed the following training offers: postgraduate training in entrepreneurial skills, financing course for innovative projects, and a series of debates towards development.

EXPRESIVA Incubator

This is an active initiative since 2010 at Universidad Nacional del Litoral and the Municipality of Santa Fe, where accompaniment, advice and diverse services are provided to initiatives, ideas or new companies to promote them to a sustainable growth. EXPRESIVA has 42 pre-incubated, 27 incubated, and 20 graduate projects (Ministry of Culture of the Nation agreement) (EXPRESIVA, 2018).

Litoral Accelerator

With the aim of supporting young companies to grow and obtain financing, Universidad Nacional del Litoral developed the Business Accelerator project, with a networking space, access to IT facilities, mentoring, and financing in exchange for a percentage of the actions. Anyone can participate regardless of whether they belong to a faculty or are people outside the university, however the focus of this Accelerator is aimed at technological and innovation projects, which they are intended to be inserted into the market.

Three institutions participate in this accelerator: Universidad Nacional del Litoral, Parque Tecnológico del Litoral Centro and Santa Fe's Stock Exchange. Its objectives are:

- Accelerating the growth and consolidation process in the market of companies with a scientific knowledge basis generated in biotechnology, life sciences, human health, animal health, environment, agribusiness, medical devices and equipment, fine chemistry, digital health, nanotechnology, and engineering; providing capital, advice, tutoring and consulting services, and access to an extensive network of contacts, ensuring the protection and transfer of intellectual property of these developments.
- Being the scientific accelerator leader to develop and strengthen a thriving entrepreneurial ecosystem, the result of cooperation between the forces of academia, R&D, technology, business, and industry, designed and built to the highest international standards.

6.8 Universidad Panamericana

The Universidad Panamericana is a private Guatemalan university founded in October 1998. Entrepreneurship is one of the values set by UPANA, being a transversal axis in the students' training of this university (UPANA, 2018).

6.8.1 *Alto Nivel* Business School

Alto Nivel is a business school that offers training programs at the graduate and master level, as well as various consulting and business support services, whose objectives are (Alto Nivel, Escuela de Negocios, 2015):

- Being a business school that challenges the traditional ideas. Examining the effectiveness and reducing what it understands as shortcomings of current educational models, proposing solutions to the market demands, according to the customers' needs and demands, and training leaders who question, propose, and positively impact on the regional development.
- Being a business school that questions the *status quo* of traditional teaching, revolutionizing study models and addressing the challenges of the region, generating innovative methods to influence, and invite people and organizations to think and act in a diverse and efficient way.

Entrepreneurship as a discipline and competences to be developed are managed by Alto Nivel in UPANA. Some of the knowledge areas that stand out are:

- Auditing
- Entrepreneurship and sustainability
- Strategy
- Finance
- Management
- Innovation
- Communication and marketing
- Projects
- Human resources

Regarding corporate services, these are intended to transfer the knowledge of the university to the different business sectors, while also putting them into practice in real scenarios by the program students. The services that are currently available are: IT systems analysis and recommendation depending on the type of business, business consulting, implementation of PMO (Project Management Office) advice, capabilities diagnosis for projects in organizational development, risk management, and accounting, audit and finances.

6.9 Universidad del Magdalena

Universidad del Magdalena is a public university, established in pursuance of Act No. 005 of 27 October 1958 ordinance, located in the city of Santa Marta, capital of Magdalena (Colombia). Entrepreneurship is a central axis as an institution, as reflected in its mission:

> Training ethical and humanistic citizens, leaders, and entrepreneurs, of high professional quality, sense of belonging, social and environmental responsibility, capable of generating development in the Caribbean region and in the country, resulting into opportunities for progress and prosperity for the society in an environment of equity, peace, coexistence and respect for human rights (Unimagdalena, 2010).

Likewise, in its institutional educational project, promoting "the sense of competition, competitiveness, and entrepreneurship as fundamental axes of social impact" and stimulating "entrepreneurship to contribute to generating in the student capabilities of leadership with social conscience, independence and autonomy" is highlighted as one of its educational lines, making entrepreneurship part of the skills they wish to develop in their graduates (Unimagdalena, 2008).

6.9.1   Innovation and Entrepreneurship Centre, CIE

Given that the promotion of entrepreneurship and innovation are fundamental axes for the university, in 2017, through the resolution No. 104, the Innovation and Entrepreneurship Centre was created (Unimagdalena, 2017), as an instance attached to the Vice-Rectorate of Research and which constitutes a network of work focused on business strengthening, together with the departmental and local governments, business sectors, and other universities of the region. The mission of the network:

Producing joint innovation programs and projects to address social and entrepreneurial needs, thus contributing to the Caribbean development. The Centre seeks to promote the culture of entrepreneurship in all its forms within the campus community.

Some of the objectives of the Innovation and Entrepreneurship Centre are developing innovation and entrepreneurship policies, carrying out awareness and training activities, developing exchange spaces between researchers and entrepreneurs, fostering cooperation and establishing alliances between the university and stakeholders, promoting the development of innovation and entrepreneurship programs and projects, as well as providing support and advice, managing resources for the execution of programs and projects, promoting the creation of funds for innovation and entrepreneurship, promoting the transformation of the pedagogical model and study plans for the effective incorporation of innovation and entrepreneurship.

Accompanying Program Unimagdalena #CIEEEMPRENDE

This is a program offered by the students centre in Unimagdalena, working with projects in initial phase with a functional prototype and with the expected result of evolving from the idea phase to validation until the final product is produced.

The process consists of mentorships accompaniment, with a duration of twelve weeks, classified according to the need of the project as it follows:

- Main Mentoring: A total of twelve mentoring sessions, one per week and two hours each, they are carried out by a member of the CIE team. These mentoring focuses on the development of the Lean Start-up methodology.
- Technical mentoring together with the main mentor: In some occasions the technical mentors are next to the main one to determine deep changes in the business model.
- Technical mentoring: Focused on technical or specific support, and based on a requirement made by the main mentor. These mentorships are carried out by mentors from the CIE mentor network.

Figure 6.8. Accompanying process Unimagdalena #CIEEEMPRENDE.
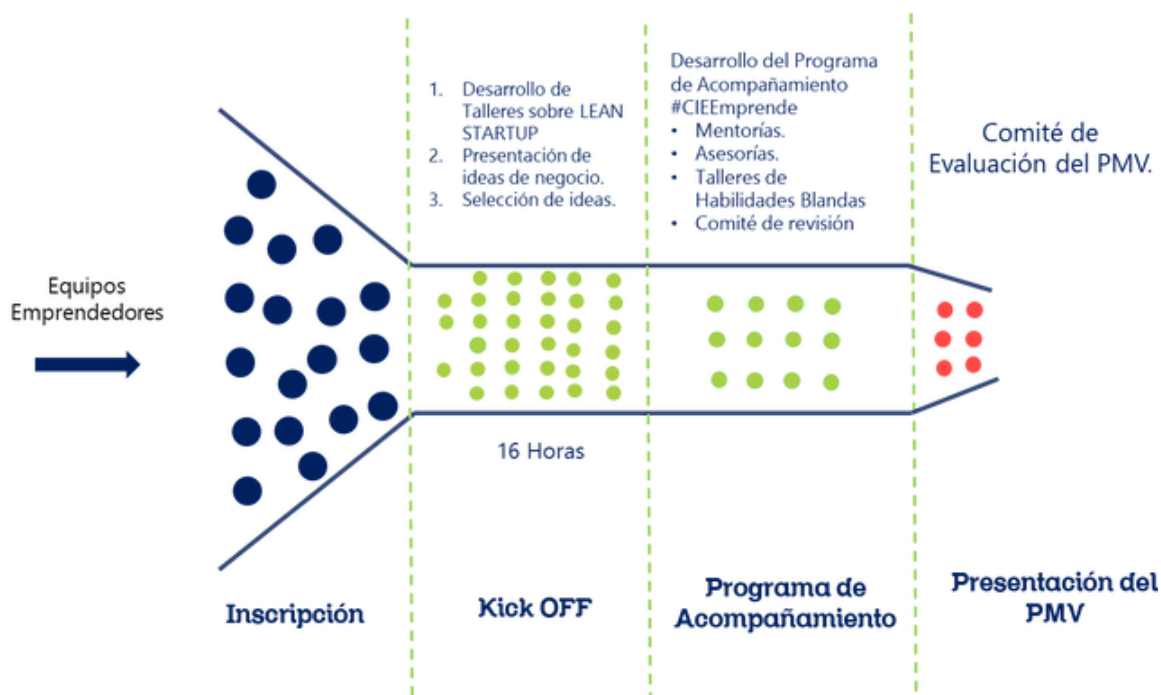
Source: Centro de Innovación y emprendimiento, 2018.

Degree Project: innovation and entrepreneurship practice

Taking into account focus on the promotion of entrepreneurship as part of the competencies of its graduates, the university included as one of its modalities of graduation the Entrepreneurship and Innovation Practice, which consists of the "formulation of a business plan, or design and development of a functional business prototype with the minimum viable product features" (Vice-Rectorate for Research, 2017).

Students must have passed at least 70% of the subjects of their degree's study plan to choose this modality. The project is to be developed with a group of maximum 4 students, with the possibility of integrating the team with students from different areas, to promote the interdisciplinary approach. The procedure of this modality is as follows (Consejo Académico, 2017):

▪ Registration of the entrepreneurship and innovation practice

▪ Evaluation of the proposal

▪ Development of the entrepreneurship and innovation practice

▪ Completion of the entrepreneurship and innovation practice, and delivery of the final report

- Composition of the jury
- Evaluation and public support of the entrepreneurship and innovation practice
- Publication

6.10 Conclusions

According to Global Entrepreneurship and Development Institute (GEDI) ranking, Latin American countries maintain a medium-low trend when we assess their entrepreneurship and innovation development levels. However, we can see the efforts of the universities to promote programs that positively impact the strengthening and consolidation of entrepreneurship and innovation as part of a widespread Latin American culture. In this sense, we must continue to lay the foundations to achieve the triple alliance, together with the governments and the industrial sectors of each country.

All the HEI from Latin America that participated in this analysis within the ACAI-LA framework corroborate, at least, the implementation of some program for the promotion of entrepreneurship and innovation. In the most developed cases it is observed that entrepreneurship becomes a transversal axis in all the academic programs, and that part of the competences of the entrepreneur are articulated within the curricula. However, in most of the evaluated cases, the greatest development of the entrepreneurship and innovation programs is observed in the faculties and/or institutes related to engineering, followed by the faculties of economic sciences.

Likewise, most universities have programs to strengthen the business sectors, mainly SMEs in early stages; business incubators and accelerators are the tools that generate the greatest results –however, significant investments are required for their development, so universities must ally themselves with the financial sector and industrial associations, in order to provide financing.

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Chapter 7. Implementation of the Master's Degree, actions and recommendations

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This chapter is based on the implementation of the Master in Accessible and Quality Virtual Education that Universidad Americana (UAM) of Managua, Nicaragua, is offering in the ACAI-LA project's framework. The feasibility study, the objectives, the professional profile, the curricular structure, the delivery of the modules by the participating universities, the main actions developed and the recommendations for improvement are highlighted, in order to have a perspective of the implementation and development of the Master.

Keywords

Master's degree, virtual education, feasibility study, objectives, professional profile, generic competences, specific competences, curricular mesh, instructional design, performance evaluation.

7.1 Introduction

The challenges of education, at university level, create new demands as regards teachers' training; it is ever more important that teachers have a solid preparation that allows them to develop their teaching activity in a rewarding way and based on a high academic level, thus increasing the quality of education.

The university professor must be, simultaneously, a teacher and researcher; two complementary activities that contribute to the integral training of the students, facilitate the continuous improvement of the study programs and the teaching methodology, renewing and innovating pedagogical strategies and establishing new channels of participation and dialogue with managers and students.

In this context, the project "Adoption of approaches to quality, accessibility, and innovation in higher education in Latin America (ACAI-LA), defined as a strategic line the opening of the Master's Degree in Accessible and Quality Virtual Education. This program envisages the development of specialized pedagogical, technological and investigative competences to develop more stimulating and motivating training processes centred on the student and their ability to discover, reflect, internalize and integrate knowledge at their own pace and in collaboration with their peers.

The Master's Degree integrates theoretical-practical knowledge and provides the development of a holistic vision on virtual education in Latin America and is aimed at professionals who are devoted to teaching and who wish to improve their teaching practice to design, lead, and supervise educational change initiatives. The virtual classroom to develop this Master will be the Virtual Campus ACAI-LA[14].

The curricular design of the Master's Degree has a competency-based approach, that is, it promotes and evaluates the performance development of both doing, being, and living together. On the other hand, 39% of the academic credits are oriented to research, which contributes to the knowledge and improvement of educational processes.

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[14] http://campus.acai-la.org/login/index.php

7.2 General information about the Master's program

- Name of the program: Master's Degree in Accessible and Quality Virtual Education
- Type of certificate: Master's Degree
- Modality: Virtual
- Regime: Four-monthly
- University that offers it: Universidad Americana (UAM), Nicaragua
- Duration: 2 years
- Modules to be taken: 15
- Student work hours: 2,350
- Academic credits: 91

7.3 Relevance of the Master

7.3.1   National context: The postgraduate offer in Nicaragua

Higher education in Nicaragua has had a wide-spread development from the 90s; in those years there were only 10 universities, all were members of the National Council of Universities (CNU)[15]. In 2003, the number of universities rose to 44 in Nicaragua, with the establishment, in only 13 years, of 34 new universities. Currently, as of May 2017 there are 61 legally established universities, 11 belonging to the CNU, including the Open University Online (UALN)[16], the remainder are universities that do not belong to the CNU.

The importance of education is out of question and many studies show that the higher the schooling, the greater the probability of improving economically. Likewise, the economic development and competitiveness of nations are linked to the training of human capital at the top level and postgraduate studies.

According to statistical data delivered in April 2017, given by the National Council of Evaluation and Accreditation (CNEA), graduates in higher education in Nicaragua, between

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[15] Governing body of Nicaraguan higher education, created on 5 April 1990, with Law 89, Autonomy Law of Higher Education Institutions.

[16] https://www.ualn.edu.ni.

2009 and 2015, were 130,214 people; of which, only 6,984 (5%) are comprised in the graduate level.

A postgraduate course is of the utmost importance at present. A professional-level university degree, nowadays, is no longer enough to have better job opportunities and survive in a competitive world; It is necessary to continue the academic learning process through master's and doctoral options. Teachers' training is a way that contributes to improving academic excellence in favour of the quality and competitiveness of educational institutions.

Because of its added value and importance for higher education, postgraduate courses in the area of education are increasingly important for the academic life of educational institutions, but in our country there is a very little offer and only a few access to them. According to the statistics of the CNEA, between 2009 and 2015 only 367 people (0.28%) graduated at the postgraduate level in the area of education, out of these, 333 (0.26%) obtained a master's degree and 21 (0.02%) a doctorate in education.

When reviewing the web pages of the Nicaraguan universities we found that, since 2014, 9 postgraduate, 15 Master's and 3 doctoral degrees have been taught in the area of education. Some of the Masters and all the doctorates were the result of agreements with foreign institutions, which allowed teachers with experience in this type of courses to promote academic excellence. Among the Masters related to ICT, which they offer, there is the Master's degree in virtual education at the Universidad Politécnica de Nicaragua (UPOLI).

The statistics of the CNEA delivered in April 2017 also show us that in 2016 Nicaraguan universities supplied an educational offer of 251 postgraduate programs, achieving 3,049 enrolled students (1.7%). Among the 181,761 enrolled students in higher education (undergraduate and postgraduate), 2,197 (1.2%) were enrolled at the Master's level and 301 (0.17%) at the doctoral level. The member universities of the CNU are the ones with the highest offer of postgraduate programs, 148 (59%), and the ones with the highest number of students enrolled. The postgraduate programs in the area of education offered were in: Education, Educational Management, Curriculum of Higher Education and Resources on Information and Communication Technology (ICT), with 621 enrolled

students, 0.34% of the total enrolled students in higher education and 20% with respect to postgraduate enrolments.

As a rule, postgraduate studies in the area of education are aimed at teaching staff who work in educational institutions at the basic, middle and higher levels. This population in our country is very high. According to the report of the good governance plan (2016), in Nicaragua, in 2016 there was a population of 60,000 teachers working in primary and secondary education. In higher education by the end of 2011, it was estimated that 7,377 teachers worked in higher education, of which approximately 47% (3,468) had postgraduate studies (Olivares, 2011).

In 2017, the number of teachers serving the national education system exceeds 70,000 teachers; of them, more than 25%, 17,500, has a bachelor's degree, which represents a large target population in which the Master's Degree in Accessible and Quality Virtual Education will impact. In the case of the Universidad Americana (UAM), the target population is 353 teachers who work each semester in this institution and, in particular, the 150 graduates of the Postgraduate in University Teaching (PDU) who have graduated between 2012 and 2017. These academics demand high level training to develop their teaching and research activities in a creative and useful way for their students, the institution, and the Nicaraguan society.

The Masters will also promote access for teachers from different universities and different regions of the country to complete their higher education, which will strengthen the national teacher training system and facilitate access to graduate programs for vulnerable populations.

7.3.2 International context: Situation of virtual education in Latin America

According to the feasibility study conducted in 2017 by Universidad Católica del Norte (UCN) of Colombia in approximately 1,655 Latin American universities, on the offer of postgraduate training programs at the level of the Master's Degree in Virtual Education and related (such as Education in Technology Educational, Information Technology, Education and ICT), there was little offer of this type of Master's Degree in relation to the 3,735 public and private universities registered in 48 countries in Latin America.

The study highlights that the information available on the web pages of the academic programs identified does not provide the relevant information such as curriculum, duration, costs, among others, to establish a holistic view of the current state of the offer of Masters in Virtual Education in different universities and countries, in many cases only the name of the program and a contact email are available. However, 36 Master's programs in Virtual Education and related were identified in countries such as Argentina, Chile, Colombia, Ecuador, Mexico, Panama, Uruguay, and Venezuela are identified, with Colombia having the largest offer in the area, offering a total of 12 Masters. The Master and specialization programs by country and university according to the University Web Ranking[17] is as follows:

1. Argentina:

   - Master's degree in educational technology at the Universidad Abierta Interamericana (UAI)
   - Master's degree in educational processes mediated by technology at Universidad Nacional de Córdoba (UNC)
   - Specialization and Masters in educational technology at the Universidad de Buenos Aires (UBA)
   - Specialization in teaching in virtual environments at the Universidad Nacional de Quilmes (UNQ)
   - Master in education in virtual environments and Master in computer technology at the Universidad Nacional de la Patagonia Austral (UNPA)
   - Specialization in education mediated by ICT at the Universidad Pedagógica Nacional (UNIPE)

2. Chile:

   - Master's degree in education, mention in educational informatics at the Universidad de Chile (Uchile)
   - Master in educational computing for teaching at the Universidad Concepción de Chile (UDEC)

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[17] Retrieved between 15 and 22 February 2017, at http://www.webometrics.info/en.

- Master in education and technologies for learning at the Universidad de Los Lagos (Ulagos)
- Master in technology, learning and education at the Universidad de Aconcagua (UAC)

3. Colombia:

- Master's degree in technological education at the Universidad Distrital Francisco José de Caldas (Udistrital)
- Master's degree in educational informatics and Master's degree in educational projects mediated by TIC (Virtual) at Universidad la Sabana (Unisabana)
- Master in e-learning at the Universidad Autónoma de Bucaramanga (UNAB)
- Master in educational environments mediated by ICT and Master in ICT applied to education sciences at the Universidad Pedagógica y Tecnológica de Colombia (UPTC)
- Computer science applied to education at the Universidad Cooperativa de Colombia (UCC)
- Master's degree in pedagogy of information and communication technologies (ICT) and Master's degree in educational informatics at the Universidad de La Guajira (Uniguajira)
- Master's degree in Edumics from the Fundación Universidad Autónoma de Colombia (FUAC)
- Master in management of virtual education at the Universidad EAN (School of Business Administration)
- Master in digital technologies applied to education in the Virtual UMB

4. Cuba:

- Master the technologies in educational processes at the Centro de Referencia para la Educación Avanzada (CREA)

5. Ecuador:

- Master's degree in education - ICT at the Universidad Tecnológica Israel (UISrael)
- Master's degree in technologies for management and teaching practice at the Pontificia Universidad Católica del Ecuador (PUSE)

6. Panamá:

- Master in higher education with specialization in technology and educational didactics at the Universidad Tecnológica de Panama (UTP)
- Master's degree in virtual learning environments and Master's degree in English language teaching with specialization in online teaching at the Universidad Tecnológica Oteima
- Master in ICT didactics at the Universidad Metropolitana de Educación, Ciencia y Tecnología (UMECIT)
- Master's degree in educational technology Universidad de Cartago (UCA)

7. Uruguay:

- Specialization and Masters in educational technology at the Universidad Centro Latinoamericano de Economía Humana UCLAEH

8. Venezuela:

- Master in educational technology at the Central University Caracas (UCV)
- Master in virtual teaching at the Universidad Nacional Experimental del Táchira (UNET)
- Master scientiarum in educational informatics at the Universidad Rafael Belloso Chacín (URBE)

9. México:

- Master's degree in Virtual Education at the Universidad Veracruzana (UV)

We observe that there are variations as regards the names given to the Masters, finding names as distant as similar to each other, you can read: Master's degree in educational technology, Master's degree in education, mention in educational informatics, Master's degree in educational informatics for teaching, Master's degree in education and technologies for learning, Master's degree in technology, learning and education, Master's degree in technology education, Master's degree in educational informatics, Master's degree in ICT-mediated educational environments, Master's degree in ICT applied to educational sciences, Master's degree in virtual education, among others, this variability shows the different perspectives and approaches to educational work related to virtuality and communication technologies, responding to the objectives of each program, to

institutional missions and, obviously, to regional educational needs, methodological approach and communication strategies and information.

In the 36 identified programs the academic credits range between 35 and 90, in addition the modalities of work are face-to-face, virtual and distance learning.

The little offer of virtual or related Masters in countries such as Mexico and Argentina, countries that are references of high educational quality in Latin America, is awkward. The number of master's programs and virtual or related specialties per university in these countries is as follows:

1. Argentina has 118 universities and only offers 7 master's programs.
2. Chile has 80 universities and offers 4 programs.
3. Cuba has 28 institutions of higher education and only offers one program.
4. Colombia has 289 universities and offers 12 programs
5. Ecuador has 61 universities and only 2 programs offer.
6. Mexico has 943 universities and only offers a master's program
7. Panama has 26 universities and offers 5 programs.
8. Uruguay with 40 universities offers only one program.
9. Venezuela with 70 universities offers 3 programs.

In these 9 countries there are 1,655 universities and they offer only 36 Master's programs and specializations in the virtual or related area.

This information allows us to note that Colombia is the country with the highest academic offer in the region, excelling in offering 12 Master's programs in virtual education and in different modalities, face-to-face and virtual, representing 33% of the offer in Latin America, followed by Argentina and Panama with 19% and 14% respectively.

Given this situation in Latin America, it is apparent that the Master in Accessible and Quality Virtual Education that is promoting the UAM is relevant to strengthen the capacities in the area of virtual education. That is why the relevance and quality of the Master's Degree is a social commitment and a requirement with Latin American society.

In order to develop this Master's Degree, the UAM has the capacity in terms of physical resources, human talents and services to offer a Master's Degree in Accessible and Quality Virtual Education. In addition, it will have the support of the Latin American partner

universities of the ACAI-LA project[18] and will be in accordance with the new educational trends and the training needs of leaders with a comprehensive vision that will effectively and efficiently perform in Latin American education. In the particular case of Nicaragua, as stated by Eng. Telémaco Talavera, president of the CNU "the country needs an education that responds to its own culture, to the needs and challenges of society, an education that is closely linked to research and innovation, and to extension as a permanent and systematic link of the university [...] Education must adapt to the challenges of the world and the new realities that each country has. There are no recipes, but each country will have to do it "(Castillo, 2016).

7.4 Components of the Curricular Design

7.4.1 Objectives of the Master

The Master program in Accessible and Quality Virtual Education has the following objectives:

1. Promote the development of professionals in the field of virtual education with solid theoretical, methodological, and technological preparation, capable of generating viable and innovative proposals and solutions to the educational problems faced by educational institutions in Latin America

2. Promote the development of skills and competences for pedagogical innovation in the field of virtual education for the modernization of educational institutions

3. Promote the training of professionals committed to the development of innovative projects in the field of virtual education

4. To train highly qualified professionals to develop educational research that contributes with innovations to the improvement of virtual education in Latin America

5. Contribute to the consolidation of research groups, capable of generating new knowledge for the improvement of virtual education in Latin America

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[18] More information at http://www.acai-la.org.

6. Promote the training of ethical, critical, and participatory professionals with an interdisciplinary vision, capable of creatively confronting the challenges of the national, regional and Latin American context

7. Promote the creation of virtual spaces with quality and accessible information for vulnerable social sectors and people with sensory limitations

7.4.2 Professional Profile

Generic Competences

1. Use the new ICT to learn permanently: abstract, analyse, synthesize, identify, pose, solve problems, investigate and apply knowledge in practice

2. It communicates very well in Spanish and in a second language, works as a team, motivates, leads to common goals and develops skills to work in international contexts

3. Commits to quality, acts in new situations, makes decisions, innovates and works autonomously

4. It is responsible, ethical, demonstrates social responsibility and citizen commitment

Specific competences

1. Design and implement virtual scenarios to achieve significant learning and comprehensive student training

2. Apply ICT to access and search for quality information in the design and implementation of educational scenarios

3. Prepares quality and accessible learning documents so that they are usable and applicable by all people

4. Evaluates the effectiveness of the educational scenarios supported by ICT to improve the teaching-learning process

5. Use virtual spaces for communication and collaboration with peers, and with the educational community; with a view to exchange, reflect experiences and products that contribute to their teaching activity

6. Design and develop research projects that contribute to the generation of new knowledge and the quality of educational processes

7. Develops a reflective and ethical attitude for the design and development of research and innovation projects linked to ICT and education

Labour profile

Given the rapid growth of virtual education in Latin America, the job market of the Master of Accessible and Quality Virtual Education has a promising future because it has a field of action in different institutions, companies and both public and private organizations. The Master in Virtual Education can perform in:

1. Educational centres (preschool, primary, junior and high school) in virtual education programs
2. In non-governmental, governmental, business and community organizations, designing and implementing virtual education programs
3. Teaching: course designer, education programs or virtual training
4. Non-school education for children and adults
5. Mediator in different levels and educational environments
6. Evaluator of virtual education educational programs
7. Researcher in the field of education

7.4.3 Training goals

It is expected that the Master has three cohorts, in the first cohort 2018-2020 107 students were enrolled, this began on 19 February 2018 and in the cohorts 2019-2021 and 2020-2022, an enrolment of 100 students is expected in each One, considering the 30% dropout rate per cohort, we expect a graduation of 75 students in the first and a graduation of 70 in each of the cohorts, this indicates that by 2022 we will have approximately 215 graduates in accessible and quality virtual education that will impact Latin American virtual education.

7.4.4   Study plan implementation

Figure 7.1. Curricular mesh Master in Accessible and Quality Virtual Education

Training areas	Semester II	Semester II	Semester III	Semester IV	Semester V	Semester VI
Basic Training	**Module I** ICT in the Information and Knowledge Society					
		Module IV. Challenges and Trends of Virtual Education				
Pedagogical Training	**Module II.** Comparative Education in Virtual Spaces	**Module V.** Theories of Learning in Virtual Environments	**Module VII.** Didactic Strategies in Virtual Learning Environments	**Module X.** Trainer of Trainers in Virtual Education	**Module XIII.** Academic Management in Virtual Education	**FINAL WORK OF MASTERY**
			Module VIII. Evaluation of Learning in Virtual Education	**Module XI** Quality and Accessibility of Virtual Educational Materials	**Module XIV.** Design and Evaluation of Virtual Training	
Training in research	**Module III.** Epistemology of Educational Research	**Module VI.** Research Action	**Module IX** Thesis seminar I	**Module XII** Thesis Seminar II	**Module XV.** Thesis Seminar III	

Source: Adapted from Caldera (2017).

7.5 Main actions developed

For the implementation of the Master's Degree, various actions were developed, we will mention them in chronological order. They are the following:

1. Creation of Campus ACAI-LA

   This action corresponded to the Universidad Galileo and is intrinsic to the project, the platform used is Moodle and it was created within the framework of the ESVI-AL project (Inclusive Virtual Higher Education - America Latina) financed by the ALFA III program of the European Union between 2011 and 2015. Ten universities and three collaborating entities participated in this project. The ACAI-LA project assumes this platform since its beginning on 15 October 2015, to develop its courses and the Master's program.

2. Elaboration of the curricular[19] design of the Master's proposal.

   On 1 and 2 June 2017, within the framework of the inauguration of the ACAI-LA laboratory of the Universidad Americana (UAM) on 31 May 2017, meetings of work, between the general coordinator of the project ACAI-LA, Elena Campos Montalvo, of the University of Alcalá de Henares and the coordinator for the American University (UAM), Miguel Caldera Torres, in order to analyse and discuss the first design proposal curricular presented by the UAM, in this meeting some recommendations were identified to improve it. On Tuesday 27 June 2017, in the face-to-face meeting with the partners, the key elements of the Master were presented and the work methodology was oriented so that the partners could enrich the proposal with recommendations and suggestions. On 14 July 2017, the second version of the proposal for review and socialization was sent to the members. In addition, they were asked to indicate the

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[19] According to the regulations of the UAM, the curricular design of the Postgraduate program must contain the following elements: Presentation, general program information; justification supported in a feasibility study; foundation; objectives; profiles (professional academic, income and exit); training goals; study plan; curriculum; descriptors of the modules; lines of investigation; Entry requirements; resources to attend the Master's degree; budget and financing; bibliographic references.

Master's module(s) that they could teach based on their experience. On 4 September 2017 the final proposal of the Master's curricular design was sent with the integration of the recommendations of the partners.

3. Preparation of the guide for instructional design

   The responsibility of this task was entrusted to Héctor Amado, technical coordinator of the ACAI-LA project and academic from Universidad Galileo, Guatemala. Between 19 and 25 September 2017, the instructional design proposal was analysed and approved. The documents prepared and reviewed were three: manual for the elaboration of a teaching guide of an accessible virtual course, template of the teaching guide of an accessible virtual course and the template of the didactic unit for an accessible virtual course, once these three have been agreed upon documents the institutions in charge of the modules assumed as guiding instruments for the instructional design of the modules of the Master. The facilitators of the modules that had to deliver the teaching guide at the next face-to-face meeting in Colombia between 22 and 28 October 2017 and the didactic guide for each module by 16 of the same year were also oriented.

4. Drafting of the academic calendar

   From the coordination the calendar proposal was worked on, which was shared with the partners on 12 October 2017, in this proposal the process of disclosure, pre-registration, selection and registration was integrated, the beginning of the teaching period, inter-semester recesses, defence of the thesis and the act of graduation.

5. Review of the teaching guides and teamwork to articulate the descriptors of the modules

   During the face-to-face meeting in Colombia one facilitator per university presented the teaching guide of the corresponding module, this activity allowed to have a holistic vision of the Master, reflect, contribute, and share experiences to enrich the presented guides. With the intention of avoiding duplication of content and establishing coherence between the teaching guides and the descriptors of the modules in the curricular design, three groups of works were formed, one of them assessed the coherence of the general training modules, another group evaluated the coherence between the pedagogical training modules and a third group the research training modules. In addition, work was done on the preparation of the evaluation rubrics that are included in the teaching guide. This team exercise was very rewarding since it allowed to establish a continuum

between the modules of the Master in order to share educational strategies, to specify the contents, competences and evaluation of the learning.

At the meeting in Colombia, a timetable for the delivery of the teaching guides and teaching guides was agreed, with the following dates being established: on 15 November the delivery of the adjusted teaching guide, on 15 December completed the didactic guides of the first three modules; On 15 January, modules IV, V and VI are completed, on 15 February, modules VIII, IX, IX and 15 March all the missing modules were to be completed (X, XI, XII, XIII, XIV and XV).

6. Master's dissemination plan

Between 1 November 2017 and 31 January 2018, an action plan was developed to disseminate the Master's Degree among the partner universities of the ACAI-LA project and other universities of the member countries. For this purpose, two PowerPoint presentations were prepared, a Web page and a promotional video were created highlighting the role of ACAI-LA in assuring the quality of virtual education in Latin America and the strengths and benefits of the international Master. In Nicaragua, presentations were made to public universities that are members of the National Council of Universities (CNU) and to private universities, and communications were sent to various Central American universities that are members of the Association of Private Universities of Central America (AUPRICA).

7. Pre-registration, selection and registration process

Parallel to the disclosure plan, the pre-enrolment, selection and registration process was initiated. The applicants, to be pre-registered, had to complete the following information: fill out an online registration form, complete and send the curriculum vitae according to a defined format, send their identity card scanned and complete an essay on the reasons for studying the Master with a brief description of the thesis project proposal according to the research lines defined in the Master. The instructions for the enrolment process were detailed on the Master's website. Once the documentation of the applicants was received, the selection and registration wre made by the coordination in the UAM.

During this stage the offer of the Master was created in the Academic Registration system of the university, the official registration was made to each student and access to the virtual classroom of the ACAI-LA campus was enabled.

Each student enrolled was emailed their student ID number, the academic calendar, the payment schedule for fees[20] and the basic guidelines on the Master's degree (study plan, the time of weekly dedication to the Master's degree, methodology, and learning assessment strategy). In this stage, the process to remove students from the Master's program was defined.

8. Process of evaluation of the modules

From February 2018 an action plan for the revision of the modules was elaborated (teaching guide and didactic guide), this plan incorporated the conformation of a commission of three people from different universities to evaluate Each module, the opinion was made using a matrix that evaluates two major aspects, the correspondence of the structure of the teachers' guide and didactic guide with the instructional design oriented and the coherence of the teaching guide with the didactic guide and the descriptors of the modules. The instrument used was a checklist that evaluated 32 aspects; it was verified if the aspect was incorporated completely in the guidelines, otherwise recommendations for improvement were proposed. Once the module was evaluated favourably, the layout or virtualization process was started and it was posted on the ACAI-LA virtual campus, as well as access to the tutors to review it and make improvements, then it was available in a virtual classroom until it was opened.

9. Beginning and development of the Master's program.

On 19 February 2018, the Master's program began with module I. "ICT in the information and knowledge society", this module was taught by three professors from Universidad del Magdalena (UNIMAGDALENA) of Santa Marta, Colombia: Edgar Villegas, Roberto Aguas and Carlos Coronado. Two days before starting the Master's program, the

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[20] The Master's fees were established as follows: professors from member institutions of ACAI-LA: U $ 1,700.00 (U $ 140.00 tuition and U $ 65.00 monthly for 24 months) and from other institutions U $ 2,000.00 (U $ 200.00 enrollment and U $ 75.00 per month for 24 months), two full scholarships will be allocated for each one of the partner institutions of the project. In the case of Universidad Americana (UAM), the indefinite contract teachers received a discount of 73% and hourly recruitment of 46%, this in coherence with the labor agreement between the UAM and its collaborating teachers.

students enrolled were sent access to the virtual classroom. As it was our first experience, several organizational problems were presented at the beginning of the module, we had a single group with more than 100 students, which made it difficult to answer questions and concerns of the students in a timely manner. These problems were overcome with the follow-up from the coordination of the Master's Degree, the willingness of the tutors to address the concerns and the timely suggestions of project partners, this module ended on 25 March 25 2018.

The Module II. "Comparative education in virtual spaces", was taught by three professors from the Católica del Norte Fundacion Universitaria, Colombia: David Oswaldo Zapata Tamayo, Andrea Carolina Perneth and Juan David Ruiz. From this module students were organized in three groups with an average of 30 students each, with this organization it was possible to achieve greater effectiveness in the learning process, provide personalized attention to the teachers and achieve a better collaborative relationship between the tutors and students.

The module III. "Epistemology of Educational Research" was coordinated by the Universidad Nacional de Córdoba.

10. Evaluation of teacher performance

In February 2018, an instrument was developed to evaluate teacher performance and identify opportunities for improvement in substantial aspects of pedagogical practice. This instrument was an online survey in the QuestionPro program, which was applied to students and teachers once each of the modules was completed. In general, the results were very satisfactory.

11. Design of certificates of participation

This task was coordinated between Universidad Americana (UAM) and Universidad Panamericana (UPANA) of Guatemala from the face-to-face meeting in Colombia on 24 October 2017, virtual education management designed the diploma proposal so that the universities that taught the modules issued the certificates to the approved students.

12. Academic performance in the first three modules

In order to prepare academic performance reports, the instruments used in the UAM were used to report grades and the qualitative report on academic performance. As of 2 July 2018, we had the grades of the first three modules, the percentage of approved students is between 58% and 78%.

7.6 Conclusions

After four months of operation of the Master's program, some recommendations are proposed in order to strengthen the capacity of the program and correct the weaknesses detected in the future. Among these recommendations we point out the following:

1. Implement a more effective strategy for the promotion and dissemination of the Master's degree that makes it possible to visualize the characteristics of the program in a broader population

2. Incorporate into the curriculum an induction module for students to become familiar with the virtual classroom, inform themselves about the curricular design, the rules and regulations that govern the Master's

3. Base the research lines of the Master's program in order to have a broader vision of those problem areas that are expected to be addressed in the thesis projects to be used for the benefit of society

4. Establish relationships with Master's Degree programs in virtual education at member universities of ACAI-LA and other Latin American universities to strengthen curricular design, promote the organization of academic events, as well as cooperation in research and publications

5. Design a strategy to motivate the participation of students in academic events with the purpose of socializing the advances of the theses of degree

6. Use inter-quarter periods for students to pass the modules that are pending and those that failed

7. Develop a sustainability plan for the Master's Degree to continue its execution beyond the completion of the ACAI-LA project

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Chapter 8. Internationalization process of Latin American Universities

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In an increasingly interconnected world, we should not limit ourselves to prepare professionals equipped with a highly-qualified academic background. There is a need for individuals and institutions capable of playing an active and flexible role in the various national and international contexts in order to face the current and future new scenarios by adopting a creative approach. This does not only mean teachers, but the entire educational community dealing with programs, agreements, and academic and non-academic activities, bridging institutions from different countries, each supplying their knowledge and experiences in that exchange, matching the international and intercultural dimensions in their mission. Internationalization is understood as a process of integral institutional transformation, inherently connected to identity and culture and linked to the changes as regards the functions of research, teaching, and networking. From this perspective, in this chapter, we will discuss about the current situation with respect to the specific advances in the internationalization processes made by many higher education centres with which we work in the framework of the ACAI-LA program.

Keywords

Internationalization of higher education, double degrees, cooperation networks, internationalization of the curriculum, university exchange, internationalization programs, virtual mobility in higher education.

8.1 Introduction

Over the last 20 years, one of the main concerns of the Latin American Universities has been dealing with their role in the local and international contexts in response to social demands. Historically, Universities were mainly working on the exchange of teachers and students in an unsystematic and isolated manner. In the second half of the Twentieth Century, they started activities linked to cooperation among countries and initiatives to establish different mobility plans in a more systematic way. In the 1980s, exchanges came from external offers and opportunities that enlarged their internship opportunities for teacher, students, and researchers as well as links among universities (Aguilar-Castillo and Riveros-Angarita, 2015).

Beginning 2000, accreditation and quality processes of the university programs were related to the demands for the transformation of Higher Education (HE) and what is called a new phase of Higher Education in Latin America and the Caribbean, which the International Institute for Higher Education in Latin America and the Caribbean (IESALC-UNESCO) conceptualizes as the third Reform. One of its challenges was to incorporate the international dimension in the mission of the universities, which demanded "to review the contents and curricular approaches of the local educational offer, as well as the academic credits, in order to establish study plans that have the flexibility required by the perspective of internationalization among countries at a regional and global level "(Estrada Muy and Luna, 2004).

In this way, the traditional vision of internationalization is gaining complexity and is conceived "as a process of integral institutional transformation, which aims to incorporate the international and intercultural dimension in the mission and institutional functions of Higher Education Institutions, in such a way that they are inseparable from their identity and culture [...]. This process should be seen as an institutional openness to the outside world and should be an integral part of the development plans, strategic planning and general policies of Higher Education Institutions" (Muñoz and Serrano, 2008).

Internationalization is considered a process of interrelation of HE institutions worldwide. It is a dimension of the international relations of universities, as it contributes to achieve greater interaction among, HE institutions and is conceived as a response of the universities to globalization, while respecting diversity. On the other hand, we can affirm that

internationalization has been favoured by the regional integration policies of Latin America, in spite of the great inequalities and poverty, for which it is essential to renew the traditional vision of internationalization that transcends the circulation of students, teachers, and researchers, to see it "as an integral tool of organizational restructuring, capable of participating in the metamorphosis of tertiary level establishments (Branch, 2015) in their institutional functions (research, teaching, and linking), in their management models and social responsibilities" (Didou Aupetit, 2018).

Today, most universities have offices and programs designed to undertake this complex task, which goes beyond exchanges, trying to develop agreed guidelines for a general improvement of HE in Latin America. However, the institutional capacities and investments in this front, did not grow at the same pace as the global trends and so did the recognition of the importance of internationalization in each of them.

From the above, we share the internationalization proposal focused on "challenges that are not solved, only, by increasing mobility, the integration of knowledge and the circulation of knowledge, global visibility or success to climb positions in the international ranking, but rather making relevance and quality the reformulation of internationalization from our complexity" (Ibarra, cited in Didou Aupetit, 2018).

Another aspect that is closely connected to the processes of internationalization is the creation and participation in inter-university cooperation networks, such as the Universities Association of Montevideo Group (AUGM), International Network of Universities (INU), Latin American Integration Network (REDILA), Latin American Network of International Relations of Higher Education Institutions (ReLARIES), Interamerican University Organization (OUI), Union of Universities of Latin America and the Caribbean (UDUAL), International Cooperation Network of National Universities (RedCIUN), Network of Cooperation and Internationalization in Central America (INCA Network), Ibero-American University Association of Postgraduate Studies (AUIP), Adoption of Approaches to Quality, Accessibility, and Innovation in Higher Education in Latin America (ACAI-LA). Among the actions that can be listed and that are being carried out in the different cooperating units in the ACAI-LA program, there are: internationalization of the curriculum, agreements and alliances with regional and international institutions for cooperation purposes, development, and networking; Double Degree; mobility of teachers, researchers, students, non-teachers

and managers; multilingualism; international management of research; ICT and connectivity; multicultural activities, among others (ACAI-LA, 2018a).

In this context, the Master in Accessible and Quality Virtual Education has a prominent role; it was proposed by the ACAI-LA interuniversity network (2018b) and promotes a cycle of research seminars, where the results are shared. This represents an open space to discuss the best strategies and innovative proposals that assure quality and accessibility of virtual education in this Latin American context. This space represents a truly international academic community where experiences are shared among academics from Guatemala, Colombia, Argentina, and Nicaragua. This learning environment allows for the training of trainers in intrinsically globalized contexts. Likewise, it strengthens cooperation relationships and creates an enriching exchange among three geographical areas that present different situations: Central America, South America, and Europe.

Below, other internationalization efforts carried out by the universities of the ACAI-LA consortium are illustrated.

8.2 Situation of the Universidad Nacional Autónoma de Nicaragua, León (UNAN-León)

Internationalization is officially identified as one of the pillars of the future development of HE in Nicaragua, with which it is intended to promote and increase competitiveness in a knowledge-based world economy. In August 2008 the National Council of Universities (CNU, 2016) and the Governing Organization of Higher Education of Nicaragua, decided to create the University Network of Cooperation of Nicaragua (REDUCNI), composed of 10 universities. This is an initial step to carry out coordination actions that lead to the skills development in the offices of international relations in each member universities as well as strengthening, in all the spheres required by internationalization, existing knowledge, strengthening and capitalizing on other experiences, adapting them to the particular conditions and possibilities existing in the international community to support the internationalization of its universities.

In this context UNAN-León understands internationalization as a sine-qua-non condition in all university activities, so that, in its structure and functions, it incorporates this perspective

within the entire University system. Espinoza Montenegro and Cabrera (2017) summarize that:

> The process of internationalization must be seen as an institutional and social openness to the outside world and must be an integral part of the institutional educational project, the institutional development plan, the strategic plan of the university and above all the integral system of management, cooperation and general policies of the Institution. (p.7)

For the institution, cooperation has been and is a key aspect to achieve greater academic efficiency and the importance that society demands to the HE institutions.

8.2.1   Promotion of the internationalization of higher education

The UNAN-León considers internationalization as one of the goals to be met in order to achieve quality; therefore, there are many actions that were developed to achieve true internationalization. Students have mobility options such as internships and a university semester abroad, especially in Spanish universities thanks to the many agreements that were signed. There are also scholarships for students, established in bilateral agreements and agreed scholarships aimed at teachers' training. The University is a member of important associations at regional level such as UDUAL, OUI, and AUIP, where the opportunities for open dialogue, facilities for mobility and training are very significant. However, there is still a long way to go to reach an international model that includes projects and actions that allow for a true process of internationalization.

Therefore, in order to achieve a true University's internationalization, we should have a proactive attitude towards the current global and local environment, with a continuous, stable and comprehensive institutional process that will lead to policies and actions aimed at the making the university play a role at a local, regional and international level, without leaving aside the demands for an organizational change required to carry on this internationalization process.

8.2.2   Internationalization in the organizational structure

International cooperation within the university is a priority to consolidate the area of participation that was built and this involves harmonizing the participation of internal actors

(teachers, students, and administrative staff) with external actors (entrepreneurs, professionals, State, NGOs, etc.) in the search for a long-term vision that will guide the institutional work in the coming years.

The Institutional Strategic Plan 2010-2019 includes among its priorities and institutional guidelines, actions for the establishment of external cooperation (UNAN-León, 2010).

Among the actions or programs, some tasks are entrusted to the Vice-Rector for External Relations, as well as strategies or institutional policies that are promoted to develop the internationalization of HE in the UNAN-León. Among these there are: initiatives aimed at student exchange with national and international universities, participation in networks and regional academic programs, joint research projects with academics from other countries, procedures for the transparent management of external cooperation, harmonization of careers at the Central-American level and postgraduate scholarships awarded based on Institution's development needs.

8.2.3   Main indicators of internationalization at the institutional level

The importance of internationalization within the institution as an objective, and not as a process, in the higher education area has stimulated the convenience of establishing indicators systems to inform about the nature and intensity of University internationalization.

The reasons behind the establishment of an indicators system are many: sensitizing Higher Education Institutions about the opportunities and characteristics of internationalization at an institutional level; facilitating the internationalization self-assessment at an institutional level; facilitating the production, monitoring, and evaluation of concrete internationalization policies; and allowing comparative studies between universities.

Hereunder, some institutional internal and external factors are analysed. The first ones consider negative aspects such as lack of international culture or limited funding. Positive aspects identified are: the institutional willingness to be an internationalized university, with a relatively high position abroad, a good level of mobilities, and teachers' master training and doctorates in national and international universities. Regarding external factors, there are some negative matters, such as: belonging to a developing or risky country, financial resources, while some positive aspects are related to geography, culture, and the society in Nicaragua.

Indicators of the teaching function

- Internationalization of the curriculum: Inclusion of international and multicultural contents and contexts into the disciplines, double-degree academic programs, extra-curricular activities for the training of a global citizenship awareness and programs aimed at social inclusion and at the knowledge of foreign cultures.
- Teachers' mobility: Active links between academics of the institution and foreign academics; participation in international academic events, participation of teachers in international programs and projects, participation in teachers' networks and international academic associations, visiting foreign teachers and budget assigned to teachers' mobility.
- Students' mobility: students participating in international academic activities, foreign students participating in academic activities, students going abroad for mobility programs at undergraduate and postgraduate level, foreign students coming in for mobility programs at undergraduate and postgraduate level and budget assigned to student mobility.
- As regards the ICTs: foreign students enrolled in virtual programs, joint academic programs: ACAI-LA Master's degree and access to virtual libraries and databases.

Indicators of the research function

- Production and dissemination of knowledge: Researchers participating in international research networks, research work carried out with foreign institutions, research presented at international events, indexed and/or refereed publications, and peer-reviewed and refereed journals.
- International management of research: budget for international research processes, research funded with international cooperation resources, access to databases of institutions and organizations that offer international cooperation to research, international events organized on research and international events organized on entrepreneurship and innovation.

Extension function and social projection

- Organization of cultural events with an international focus, intervention projects involving international actors, organization of sport events with an international focus, university

artists attending cultural events abroad, university athletes attending sport events abroad, international artists received and international athletes coming in.

8.3 Situation of the Universidad Americana (UAM)

The American University of Nicaragua, even if established only two decades ago, in 1992, managed to gain a national and international recognition. It is currently offering 21 undergraduate degrees and a broad portfolio in continuing education programs aimed at training students on personal and professional skills enabling them to face the challenges of the modern world.

In accordance to these quality and modernization standards and to its own vision as an institution, the UAM has been working for several years in a constant process of building an international profile that is also envisaged by its Institutional Development Plan under the supervision of its International Programs office. In this respect, its policy is focused on promoting the academic identity of the institution and making its students develop the skills allowing them to enhance their competitive power in an increasingly interdependent world.

This process was developed based on the guidelines of an internationalization policy aimed at involving the entire UAM's community (managers, teachers, students, and administrators) in outlining its strategic development plan. Its objective is to promote and strengthen its position as a world-class academic institution.

8.3.1   Internationalization policies

The UAM's internationalization process of is outlined in the policies and goals listed in Table 8.1.

Table 8.1. UAM's internationalization policies and goals

Policies	Goals
Granting a continuously international-level evolving and innovating educational process	- Permanent update of the study programs. - English as a second language. - Effective acquisition of the ICTs in carry out the educational process. - Development of international skills.

Policies	Goals
Strengthening and promoting academic and cooperation relations and working in networks including international high-level institutions	▪ Granting of concrete cooperation actions thanks to agreements with foreign universities. ▪ Development of strategic alliances with institutions and associations at regional and sub-regional level. ▪ Participation in international networks at institutional and career levels. ▪ Promotion of the mobility of students, teachers and administrative staff at pre and postgraduate level from and to the institution. ▪ Promotion of partnerships for the development of international joint research programs.
Creating an international environment on campus	▪ Development of a modern infrastructure based on international benchmarks. ▪ Constant improvement of connectivity. ▪ Promotion of multicultural activities. ▪ Assurance of high quality and efficient in the administrative services. ▪ Creation of opportunities for learning English for the teaching and administrative staff.

Source: Universidad Americana, 2018.

8.3.2 Outstanding internationalization programs

In trying to achieve its policy goals, the UAM joined many communities and internationalization programs, some of which have a long history, such as the *International Student Exchange Programs* (ISEP) established in 1979. Below you find a list of the most important ones:

▪ *International Student Exchange Programs* (ISEP): Promote the students' inclusion into high-quality academic programs in more than 300 universities, in 50 countries. Its objectives are focused on helping students overcoming financial and academic barriers in studying abroad, regardless of academic importance, socio-economic status and geographical location. The enrichment is two-fold since this program also allows foreign students to join the UAM's campus, promoting a global approach and diversity inside and outside the classrooms, which adds value as it assures different perspectives, opinions and experiences enriching the UAM university community.

▪ *Council on International Educational Exchange* (CIEE) *work and travel USA:* it offers UAM university students the opportunity of working during their academic holidays;

getting to know various aspects of life in the United States exploring the culture of that country and also to get a monetary compensation for their work and gain a relevant work experience.

- *National Aeronautics and Space* (NASA) *Space Apps Challenge:* For five years now, the UAM has become the hosting institution for this global event, also known as "Hackathon", which brings together problem solvers from around the world to face challenges in an innovative way. The objective of this program is to provide new solutions to challenges and problems that affect mankind and also to promote innovative ideas for the exploration of outer space. It seeks to inspire and develop in the UAM students and in the rest of the participants, innovation, and creativity.

- Global Consulting with the University of Ohio: since 2013 the UAM has been yearly attending this program in which only twelve countries participate worldwide, including China, Greece, the Czech Republic, among others, where, for two weeks, teams of students integrated heterogeneously by the two universities, work together to provide free consulting services to businesses in the public, private sector, to NGOs, etc.

- *Cornell* UAM *Thrive*: In this program, where UAM, Cornell and Thrive Nicaragua collaborate, provides a training area in Managua in the field of human resources, based on a business model. For a week, groups of students from these institutions make visits to local companies, providing them with intensive needs assessment services, as well as training for the businesses involved.

8.4 Situation of the Universidad Galileo (UGAL)

Universidad Galileo was recognized by the Council of Private Higher Education of Guatemala in October 2000 and this made it the first technology-oriented university in Guatemala. Universidad Galileo is a Higher Education Institution, product of the work and constant effort of a selected group of professionals headed by Dr. Eduardo Suger Cofiño, founder and Rector, who managed to formulate a fully innovative educational proposal, unlike the traditional one, and that is driven by a very clear motto: "Educating is to change visions and transform lives".

The UGAL's activities are inspired by a philosophy caring about the individual as a human being, with education as the main engine for personal and social growth, accompanying the

development of the country in an environmentally sustainable manner. Always in a framework of ethical, legal, and economic principles for a society of free and responsible people in peaceful coexistence, regardless of religious beliefs, races or policies, in pursuit of the common good.

All the above is always based on the strong belief that teachers are the most important factor of change in this process of improving society, that its role is that of an efficient trainer at the service of the new generations and of their needs, creating students and autonomous professionals who are flexible to changes, with self-learning capacity. In that sense, it recognizes the urgent need for world-class education, endowing the community with human resources having deep training in science and technology, with a strong imprint in the management of information technologies. The objective is to create professionals prepared to compete globally.

Its vision and mission as an institution is to develop human thinking by revolutionizing HE, with the aim of educating true players in the solution of social development problems of the Guatemalan community.

Although the UGAL has not yet a comprehensive internationalization policy, it carries on actions in that sense, which accompany the goals and visions illustrated above. For example, we can highlight the participation of UGAL in the edX Consortium, an initiative led by the prestigious HE institutions of Harvard and MIT (Massachusetts Institute of Technology). The UGAL plays a leading role in the Open Massive Open Online Courses (MOOC) movement, a valuable instrument for the democratization of education. At present the UGAL established over 40 collaboration framework agreements with institutions and leading companies around the world. He also stands out as an important player in international projects, related to various issues among which we can mention: climate change, renewable energy, education supported by technology, entrepreneurship, and web accessibility, among others.

8.5 Situation of the Universidad Católica del Norte (UCN)

Universidad Católica del Norte is a 100% virtual institution and a pioneer in Colombia. Since its establishment, it has been making efforts to strengthen and facilitate training processes based on Christian values through virtual learning environments to contribute to the creation of a fair and inclusive society. In its vision, the institution states its interest to be globally recognized as a virtual educational community, by offering inclusive educational services and excellence, the Internationalization Directorate was established for this purpose; later on it was consolidated and it launched certification processes, double degrees (joint degrees), a more dynamic design and supply of training projects, as well as academic mobilities for students, teachers, researchers, and administratives, design and development of international cooperation projects, and promotion of intercultural issues.

The institution defines internationalization as a structural component of the curriculum, which enables the permanent pursuit of excellence and academic quality of the institution, the research and academic interaction for social, scientific and technological development in the context of the globalization of education, of the humanization of development and the advancement in the society of information, knowledge, and learning.

8.5.1   Context and stages of evolution

At the beginning, the UCN's actions having an international focus were entrusted to the Institutional Extension and Projection Department, with internationalization being a scenario that aimed at the consolidation and establishment of contacts, presentation of cooperation projects for development, training proposals with other boards outside the national territory and putting into practice the lines of the internationalization policy of the Ministry of National Education of Colombia (2011-2012). On 23 July 2012, as can be seen in the Minutes of the meeting of the Board of Directors, the Internationalization Department was established as an independent unit of the Extension Office.

Below, we describe the stages that show the evolution from this recent past to the long-term projections of the Internationalization Directorate.

- Organization of information: from this stage, action plans, strategic guidelines for the operation and definition of policies are structured.

- Development of activities: Implementation of the action plans that were outlined by the different directions through the internationalization policy. Memberships in strategic networks, development of academic projects, and participation in international cooperation projects, positioning and visibility of the Catholic University Foundation of the North are presented here.

- Consolidation of Management: Redundant in a robust organizational structure, with prolongation over time. The harmonic demand for the activities and scope of the Internationalization Department facilitates sustainability, together with other institutional processes and services. It is supported, both in the general budget and in self-generated income through cooperation projects and/or services, from which consequently the results can be evaluated, the impacts measured, and good practices established.

- Cross-allocation of the main functions of the institution: each unit dialogues harmoniously with its international peers and develops its own structuring protocols in a flexible and easy way, always based on high-quality educational standards. This is the vision of the Directorate, which can be reached at any time in which its strategic areas of interested are involved.

The ORI (Office of International Relations) can be reached, when required by the activities carried out within the Directorate of Internationalization.

8.5.2 Organizational scheme

The Directorate of Internationalization plays a missionary function, which supports the training needs of communities and aims at their continuous improvement and satisfaction. A restructuring is planned to turn it into a supporting board that responds to the demands of all the institutional units, at the different strategic areas of action, with each main function, enhancing its own actions and joint actions. Below, Figure 8.1 is presented, with a sketch of the organization of this Direction.

8.5.3 Strategic areas of action

The strategic actions describe aspects, dimensions, dynamics, factors, issues, focuses, needs, possibilities, characteristics, or components which will be sought, encouraged, and promoted by the Internationalization Department. Each one of the areas is presented with

the concrete objectives of internationalization of the institution and, at the same time, as a category, that is, within which different specific activities will converge and result.

It highlights the strengthening of cooperation networks and scenarios, and collaboration for the development of training processes and programs for vulnerable population and minorities.

In order to favour research, teaching, extension, and management, virtual and face-to-face environments are promoted to contribute to the collective enrichment of national and international institutions through forums, debates, seminars, and cultural meetings. Exchanges and internships of teachers, students and administrators are also supported. It manages not only the physical mobility, but also in a virtual modality, besides promoting teleworking for international professionals. Likewise, it is proposed to manage and disseminate opportunities of economic funding in areas of studies, research and projects for the academic community through scholarships.

Figure 8.1. Organization chart of the Directorate of Internationalization
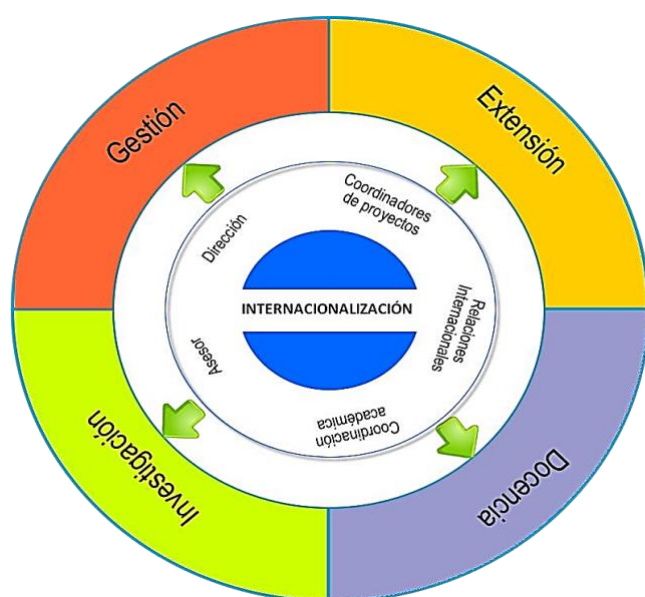
Source: Católica del Norte Fundación Universitaria (2018).

It is interesting to note the visibility level acquired through the participation in international and national events aimed at enhancing the pedagogical proposal of study in a virtual modality and the academic offer, the management of strategic areas of action, resources, offers of academic and cultural programs, and research development. It establishes

international standards and institutional structures in order to favour and develop joint programs aimed at the double degrees.

Virtual classrooms deal with intercultural and international aspect, that is to say, subjects in English, bibliographical references and consulting in other languages, bilingual teachers, global case studies, and other dynamics promoting the academic work, investigation, projects of transnational and inter-institutional extension.

Another strategic action is to promote multilingualism through immersive programs, training in foreign languages for the preparation of scholarship exams, bilingual teachers, academic exchange, and research in foreign languages.

The internationalization of curricula is a permanent demand for adapting curricular processes to international academic parameters, promoting flexibility and favouring national and international recognition.

Acting as reference point for internal development processes by strengthening local and regional institutions, in order to facilitate these actors to interact (in a dialogue among peers) with the globalized world and highlight their competitive and comparative advantages.

8.6 Situation of the Universidad Nacional del Litoral (UNL)

This University, approaching its 100 years anniversary, was and is a direct witness and participates in the development of an entire region. The University reform of 1918 of the Universidad Nacional de Córdoba, had a positive impact on the University's democratic, participatory, collegial, and pluralist forms of government. The ability to govern itself and to choose its own authorities with autonomy, since then, has been a hallmark of the UNL and the universities of the Argentine public system.

The UNL aims to educate free citizens capable to integrate into a democratic society, with the highest level of quality and in all the diversity of scientific, technical, humanistic, and cultural knowledge. In accordance to this, it aims to internationalize its actions, by fully integrating associations and groups of universities, promoting the mobility of its teachers, researchers, students, and managers, participating in international forums and developing cooperation initiatives with prestigious institutions.

In its Institutional Development Plan 2010-2019 (UNL, 2010), the process of internationalization is considered as a guiding element of the institutional policies for the current decade. It is aimed at renewing the objectives of a process launched over two decades ago, maintaining a planned and globalized action aimed at modernizing and improving institutional quality, with a focus on the important functions of teaching, research, and extension.

This process of internationalization involves all institutional actors, be they managers, professors, students, as well as all institutional services, both academic and supporting ones. Starting with the Rectorate, as well as with the Faculties themselves, many activities were developed enabling to attract many teachers and students into mobility programs and international cooperation.

With the aim of generating systematized actions that are oriented towards the internationalization of curriculum, a three organizing components strategy is implemented:

Table 8.2. Components and actions of the internationalization strategy of the curriculum.

Components	Actions
International educational courses of action	International educational proposal of the UNL: ▪ International Winter School ▪ Open Chair of Latin American Studies "José Martí" ▪ Spanish elective course for foreigners ▪ Global Competitiveness Program for SMEs (GCPyMES)
Internationalization of curricular spaces	Internationalization of curricular spaces in undergraduate training at the UNL
International cooperative races of the UNL	▪ Double degree programs ▪ Joint degree programs ▪ Programs of consecutive titles

Source: (Universidad Nacional del Litoral, 2018).

Below, some of these actions are developed.

8.6.1 International cooperation

With the firm belief that knowledge overcomes geographical borders and has a universal character in the current globalization context, and being aware of the benefits of scientific exchange between its community and that of other institutions of the world, the Secretariat of Institutional Development and Internationalization, carries out several international cooperation actions such as establishing agreements and conventions, and actively participating in forums, meetings and international networks.

In addition, each semester the University opens its doors to international students from countries such as Germany, Brazil, Mexico, Peru, Uruguay, Bolivia, Paraguay, Costa Rica, Uruguay, Chile, Cuba, Colombia, Switzerland, United States, Spain, Italy, and France, who arrive in Santa Fe to carry out various academic activities. In addition, the International Winter School of the UNL offers a short-term training program focused on Latin American issues.

On the other hand, through a wide range of academic exchange agreements and scholarships, every year a significant number of UNL undergraduate and graduate students move to other universities around the world. In addition, the institution has different exchange programs for its teaching staff and its non-teaching staff. Besides, the university places its actions into an international context promoting the participation of the actors of the institution in missions to different foreign countries and in international projects. In order to support these measures, since 2004, the University has a Language Centre where many academic and cultural activities take place.

8.6.2 Internationalization programs

The UNL carries on the following internationalization programs:

- Academic-Scientific Mobility Program (ProMAC): Promotes scientific activities related to research projects that are linked to tasks carried out by other scientific groups abroad, academic activities derived from current agreements, training activities and/or academic training, and participation in congresses or scientific meetings of international scope.
- PILA Program: Program for teachers, management and non-teaching staff of the UNL, with the purpose of carrying out a mobility with funds to promote inter-institutional

cooperation actions, the exchange of teachers and the training of managers of internationalization activities of the institutions.

▪ International Student Mobility Program (PROINMES): Mobilizes a growing number of students with different academic destinations from foreign ES, whose stays extend for at least one semester, with the particularity that the studies carried out by students at other universities are recognized by the UNL.

▪ ARgentina France Ingenieros TECnología program (ARFITEC): Its objective is to promote the mutual recognition of the training of Argentine and French engineers.

▪ Argentina-France Agriculture Program (ARFAGRI): It is based on the implementation of cooperation projects between Argentine and French ES institutions linked to the agronomic, agri-food, veterinary and related disciplines.

▪ Argentine Fund for Horizontal Cooperation (FO-AR): It is a program in which the Argentine Foreign Ministry provides technical cooperation to countries of equal or lower relative economic and social development, in order to contribute to the growth of countries and their people.

▪ Program of Managers and Administrators of the Universities Association of the Montevideo Group (AUGM) (SCALE of AUGM): Promotes the cooperation and integration of the universities that make up the association in the regional space.

▪ AUGM TEACHING SCALE: Promotes the exchange of teachers and researchers among the universities of the Montevideo Group in order to contribute to the construction of an "expanded common academic space" in the region.

8.6.3 Networks

The UNL integrates several networks established by Argentine and foreign universities. With them, a constant relationship is maintained, and joint activities are carried out:

▪ AUGM: University Association of the Montevideo Group, made up of universities from Argentina, Brazil, Bolivia, Chile, Paraguay and Uruguay.

▪ INU: International Network of Universities, global consortium of ES institutions.

▪ REDILA: Latin American Integration Network.

▪ ReLARIES: Latin American and Caribbean Network of International Relations Networks of Higher Education Institutions, made up of Argentina, Brazil, Chile, Cuba, Ecuador, Bolivia, Colombia, Uruguay, Paraguay, Mexico, Venezuela, Peru, and Central America.

- OUI: Inter-American University Organization.
- UDUAL: Union of Latin American Universities.
- RedCIUN: International Cooperation Network of National Universities.

8.7 Situation of the Universidad Nacional de Córdoba (UNC)

In the framework of the process of HE internationalization, the UNC has the vision to become a leading academic centre, contributing to support the values of public education, with quality and equity. According to this, the Prosecretaría de Relaciones Internacionales (PRI) has as its mission that of establishing links between the UNC and various international actors, through the promotion of cooperation projects with HE institutions, academic-scientific networks, and regional and multilateral organizations.

8.7.1 Objectives

From the mission of the house of high studies, two main objectives emerge, one that is planned by the UNC and another that it is offered to the world:

1. Making the UNC play an active role in the HE internationalization process, which entails the following general actions:

   - Promotion of an academic culture that reorients the university community towards the new modes of operation of international cooperation
   - Enhancing exchange and student mobility, at undergraduate and graduate level, through scholarships and special programs
   - Encouraging the participation of teachers in international academic teaching and research programs and networks
   - Promotion of inter-institutional agreements in strategic areas for the development of new programs that articulate the university with local and national development
   - Strengthening academic links with regional ES networks for Latin American integration

2. Establish the UNC as an academic centre of excellence for foreign students, undergraduate and graduate, who wish to complete partial or full studies, for which the following actions are proposed:

- Re-adaptation of regulations and regulations regarding international students
- Start-up of the Spanish and Latin American Culture Program (PECLA), aimed at international students, with Spanish language courses and Latin American and Argentine culture
- Promotion of the UNC as a centre of excellence for the permanent training of international graduates who pursue training in specific areas
- Advice for potential students, registration with the UNC, monitoring and certification by the PRI
- Work articulated with the different academic units of the UNC to channel the new international students

In order to achieve these objectives, the PRI is the link between foreign delegations and the academic community of the UNC, fostering new agreements and strengthening the numerous existing agreements.

8.7.2 Actions for the promotion of internationalization

- At present, 280 interuniversity cooperation instruments are in force, including framework agreements, specific agreements and letters of intent, with 39 countries.
- The UNC is a member of networks and associations that promote internationalization and international cooperation such as UDUAL, OUI, Universia-Argentina University Network, Columbus Association of Universities of Europe and Latin America, Network of Public Macro-Universities of Latin America and the Caribbean, among others.
- With respect to student mobility in 2016, the UNC received 111 students from Latin America and the Caribbean and more than 100 students participated in exchanges in Latin American countries and 15 in Colombia.
- Standing out as the main event aimed at the internationalization of the UNC, the XIX General Assembly of the UDUAL, in which for two days, authorities of 246 houses of high studies of Latin America and the Caribbean met. During the meeting they appointed their new authorities and panel discussions were held on current and central topics of the HE in the region. The final document, with a view to the meeting of the Regional Conference on Higher Education (CRES) 2018 that was held in the UNC, ratifies the consensus reached by the CRES held in Cartagena de Indias in 2008, in which

education is considered as a human right, a social good, and a responsibility of the states.

- In November 2016 the Conversation "Living in Córdoba, working abroad" was carried out, together with the Directorate of Follow-up and Strengthening of the Graduate Labour Insertion of the Secretariat of Academic Affairs, which was attended by 80 attendees. It was aimed at students of recent years and recent graduates interested in thinking about new modalities of professional projects. There, experiences of exporting services and trajectories of different professionals were heard, as well as working modalities in International Organizations and Civil Society Organizations of regional impact.

- It also participates in university networks such as: AUIP, UDUAL and the networks of the Ibero-American Academic Mobility Program (PIMA) of the Organization of American States (OEI).

- The UNC, through the PRI, maintained its collaboration in more than 25 international cooperation programs, which project the university in different international scenarios, such as: UNC Program to the World, PIMA, Academic Program of Educational Mobility (PAME) of the UDUAL, and Calls of the AUIP.

- As regards the agreements, the UNC currently has more than 300 current agreements with educational institutions abroad. The agreements, mostly framework agreements, are made with universities in the following countries: Germany, Belgium, Bolivia, Brazil, Canada, Chile, China, Colombia, Korea, Costa Rica, Cuba, Ecuador, Spain, United States, France, Holland, Honduras, Ireland, Italy, Japan, Mexico, Peru, Poland, Puerto Rico, United Kingdom, Czech Republic, Russia, Sweden, Uruguay, and Venezuela.

- Likewise, the UNC collaborates in different degree and postgraduate exchange programs for the exchange of students, as well as bilateral cooperation and scholarships. For example, the Bilateral Cooperation Program for the Exchange of Undergraduate Students (PIEG), PAME, UNC to the World Student Mobility (UNCM), MARCA Regional Academic Mobility, Academic Mobility for credits-Doctorate, Emerging Leaders in the Program Americas (ELAP) of the Government of Canada, Erasmus + Action 1, and Ibero-America Scholarships, Undergraduate Students of Santander Universities; among other.

Following its internationalization policies, last June, on the occasion of the CRES 2018, held in Córdoba, the UNC signed an agreement to recognize training journeys with universities from seven Latin American countries, such as Universidad de la República de Uruguay, Ciencias Forestales from Honduras, Nacional Autónoma de Honduras, Pedagógica Nacional Francisco Morazán from Honduras, Universidad de Panamá, Universidad Nacional de Agricultura from Honduras, Universidad San Carlos from Guatemala, Tecnológica Federal de Paraná in Brazil, Universidad de Costa Rica, Universidad Católica de Santa María de Perú.

8.8 Situation of the Universidad Panamericana

Universidad Panamericana is a recently established institution, close to reaching two decades since it began to teach higher level careers. Thus, the internationalization actions are in the project stage, so that it is still in the maturation stage for the creation of a comprehensive internationalization policy.

The goals and objectives are aimed at a greater process of internationalization, outlined in its mission and vision in that sense, since it is understood that Guatemala has overcome its borders, so education must be accompanied by an international component, which allows to achieve quality and maximum performance in the student, as well as high institutional standards. Therefore, in the words of members of UPANA management, "it is important that both teachers and students can find an international experience that allows them to grow as human and professionals".

8.8.1 Objectives

Currently, within the plans that are structured in this sense, design of programs with a highly international content is implemented. In order to achieve this objective, strategic alliances are being established with different regional and extra-regional universities, in order to attract teachers and high-level programs to be included into the curriculum.

In the first instance, it works with short-term objectives, which consist in establishing alliances and programs with Iberian-American universities, taking advantage of the characteristics of closeness and similar socio-cultural visions; then, in the medium term with

more consolidated structures, achieve another type of alliances with universities in other regions of the globe.

8.8.2 Internationalization policy

UPANA still does not have a consolidated internationalization policy, the current process is progressively structured on the promotion of agreements and alliances with universities with similar principles and goals, allowing the strengthening of current programs and promoting, in addition, bringing to Guatemala support programs from the countries which, among others, are considered strategic. Our participation in ACAI-LA is a challenge.

8.9 Situation of the Universidad del Magdalena (UNIMAGDALENA)

The Institutional Development Plan 2010-2019 establishes, as one of its Strategic Objectives, to "Strengthen the internationalization of mission processes: teaching, research and extension promoting openness and interaction with the international community". In order to achieve this objective, strategic initiatives are implemented, namely:

- National and international mobility of the university community
- Multiculturalism and multilingualism
- Internationalization of the curriculum and international cooperation

These objectives and strategic initiatives have some indicators and goals that are set each year, including: number of programs in double international degrees; allocation of funds for an internationalization; percentage of certified teachers in English B2; number of professors, students, and administrative staff in international mobility and number of programs with active international agreements, among others.

8.9.1 Objectives

The internationalization of curricula in UNIMAGDALENA has two main objectives, both envisaged into its institutional educational project: the qualification and international training of its teachers, and the development of international and intercultural competences of its students. Regarding the first axis of this component, the institution makes a significant effort

through the implementation of a programmatic strategy based on several programs and initiatives.

8.9.2 Internationalization strategies

Below are some of the strategies that were developed from UNIMAGDALENA:

- Advanced training program: authorized in 2002 by the Higher Council, it allows local teachers, professors and graduates of UNIMAGDALENA to access postgraduate studies at the level of Masters, Doctorate, and postdoctoral stays in Colombia and abroad. The selected candidates directly access it and are granted a fee, annual journeys, enrolment costs and materials for their studies. In addition, they receive a monthly bonus as compensation for living costs in the case of their postgraduate studies abroad. The program is partially financed with income from the Departmental Stamp tax, which guarantees its sustainability. 25% of the current teachers of this university participated in the program and 10% did so through postgraduate studies and post-doc stays abroad.

- International internship program: financed and managed by the Vice-Rector for Research, allows UNIMAGDALENA research teachers to stay abroad for a period up to six months. Likewise, it allows financing the mobility of foreign researchers to this university.

- Teaching international mobility project: this project was part of further institutional action plans since 2010 (this is the institution's annual investment plan) and allows international mobility of teachers for participation in teacher qualification and training activities, including improving foreign languages skills.

Through the supported implementation of these programs and projects, the university seeks internationalization, strengthening the quality of its research and teaching processes. Having an important base of teachers with international experience, both in their postgraduate training and in their further experiences of scientific collaboration, is a considerable advantage when implementing curricular internationalization processes in an integral sense. This is how the institution, through the Office of International Relations (ORI), interacts with the growing faculty with international experience and their respective academic programs, for the planning and implementation of internationalization activities that impact the classroom and teaching in general.

The second axis of curricular internationalization has two main initiatives: the first, the internationalization of teaching through the interaction of the ORI with the academic and teaching programs; and the second, the implementation of the scholarship program for international student mobility "Conexión Global". Regarding the first initiative, the ORI agrees on an annual internationalization plan with each academic program that includes activities such as international virtual classes; realization of classes in English and recording of contents and international case studies in the different subjects. This is done through a Procedure and a Guide, available in the Management System of Quality Assurance of the university (COGUI + System).

The second initiative is an international student mobility plan called the Global Connection. This program gives full support to international mobility and free preparation in foreign languages for the best UNIMAGDALENA students. They can access academic semesters, internships and double degrees in universities and foreign companies and most notably to non-Spanish-speaking destinations. More than 300 students benefited from mobility supports since 2013 and more than double this number have benefited from free language courses in English, French, Portuguese, and Italian. Among the destinations are the University of Regina (Canada), the Neurobehavioral Institute of Miami (USA), the University of Sao Paulo (Brazil), University of Roehampton (United Kingdom), Sapienza-Università di Roma (Italy), Université Nantes (France), École Nationale d'Ingénieurs de Metz (France), Vrije Universiteit Brussel (Belgium), Université de Mons (Belgium), Czech Technical University (Czech Republic), Tallin University (Estonia), and Liaoning Normal University (China) , in addition to companies such as Alcatel Lucent, General Electrics and Vaneo (France), and Tata Consulting (India).

At this point it is worthwhile to put a special emphasis on double degree initiatives and also include the contribution of management in international cooperation projects to curricular internationalization in a broad sense. Participation in double international degree schemes is one of the main indicators of the internationalization of the curriculum. This has resulted in the signing of the first three agreements of this type in the last three years: with the National Engineering School of Metz (France), the Higher School of Mining Engineering-Albi Carmaux (France), and the Free University of Brussels-VUB (Belgium). Five students have been mobilized under this scheme, with partial funding. They are in the advanced process

of signing agreements with the University of Minho (Portugal), University of Nantes (Portugal), and the University of Rome-La Sapienza (Italy).

As regards the management of international cooperation projects, the university participated in 22 projects of the Erasmus Mundus Action 2 Partnerships, Erasmus+ Credit Mobility and Erasmus+ Capacity Building programs. 122 members of the university community have benefited from European scholarships that have included full doctoral training, doctoral, and post-doctoral stays, full master's degrees for graduates, master's stays, teaching for a week up to a month, and student exchanges at the level of undergraduate. The same has been achieved with 27 European students and teachers who have made stays or exchanges in UNIMAGDALENA within the framework of the same projects.

The administrative unit in charge of the Inter-institutional Relations Process of UNIMAGDALENA, as it is described in its Process Map and in its General Statute, is the Office of International Relations (ORI). This has a staff workforce composed of a Head of Office, two university professionals and an administrative technician. In addition, the ORI gotassigned in 2017 five professionals as contractors for the development of different programs and projects. This brings the total number of full-time staff to the Office to nine professionals.

The ORI is divided into three areas: an area of mobility, which is responsible for coordinating incoming and outgoing student mobility at a national and international level, including the administration of the Global Connection program; a project area, which manages international cooperation projects and others with external financing; and the administrative area, which is responsible for the internal processing of agreements, with immigration registration and advice, the registration and reporting of statistics and other matters of this nature. As regards the relations with the academic programs and faculties concerning curricular internationalization initiatives, two teachers of the Faculty of Education have a partial assignment to the ORI to lead this process.

8.9.3 Projects for the internationalization of the 2017 Action Plan

The investment in internationalization of UNIMAGDALENA is organized and executed through the Action Plan or annual investment plan of the university. In 2017, the Action Plan

included six main projects that impact on indicators of mobility, training, qualification, and teacher training, as well as the impact and international visibility of research. The first of these projects is entitled Strengthening the Internationalization Policy of UNIMAGDALENA and includes, among its goals, a certain number of students in international mobility within the framework of the Global Connection program, free language courses for Global Connection students, international mobility of incoming students, participation in networks and teacher training in international cooperation.

The second project is entitled Strengthening and Qualification of the Teaching Staff and has specific quantitative goals regarding professors in Advanced Training (Doctorate studies or post-doc stays at national or international level with funding from UNIMAGDALENA) and selected teachers in public calls of merits.

The second and third projects fund the national and international mobility of teachers and students for their participation in conferences and academic events. Of these total items, historically more than 60% of international mobility has been invested.

The fourth project is entitled R+D+I Project Financing and has among its goals a certain number of R+D+I projects presented for internal, external, and international cooperation funding, which historically has shown 10% of investment in co-financing projects in international cooperation.

The fifth project is entitled Strengthening Relationships with the Environment for the Realization of Activities in R+D+I and counts among its goals with determined numbers of members of research groups in national and international R+D+I internships; national and foreign researchers in internships at UNIMAGDALENA and participation in national and international events in the same area.

It is important to note that this budget does not include resources for international management, which includes participation in meetings, conferences, and national and international events of UNIMAGDALENA executives in different areas, including the Rector, Vice Rectors and Head of ORI. These resources are planned and executed through the central operating budget of the institution.

8.10 Final Conclusions

After analysing the information illustrated above, it is possible to say that the developments made in internationalization strategies are based on comprehensive and far-reaching policies, which show different levels of cooperation for development with a north-south-south approach, and the management of international projects is important as well. In general, all this had an impact on the improvement and modernization of the technological equipment, as well as on institutional training, both in the academic and administrative areas. It is not simply a matter of attracting technical and financial resources from cooperation, but also internationalizing means strengthening local and regional institutions, allowing actors to interact with a globalized world, which makes it possible to make clear their competitive and comparative advantages.

These policies enhance the development of institutional and professional capacities, which increase the level of academic standards and the competencies of graduates in a multicultural world, also as regards the challenges it is facing.

In conclusion, it is possible to affirm that the stages described as a context and in the process of evolution present an internationalization direction that is consolidated, since the institutional main functions are well suited to an international culture and this permeates mutual activities. Over time these functions become indistinguishable from the local institutional culture, since they generate models of institutional and curricular interaction, which adapt to give answers that are more in line with the worldwide current context. In short, a successful internationalization process involves strengthening local and regional institutions, allowing actors to interact with the globalized world.

The ACAI-LA project demonstrates this through its main activities and agreements signed between the consortium's universities, in which the commitment to a transformation aimed at internationalizing HE is highlighted, expanding the possibility of developing joint initiatives to promote an open and networked virtual HE, fostering the virtual mobility of students and creating regional associations that facilitate the exchange of experiences and innovative scientific and technological knowledge. "The increase of cooperation between peers and networks of Higher Education institutions meets the wide need to contribute to overcome educational borders, fostering innovative potentials as vehicles that drive, at the university level, the socio-economic development in Latin America" (ACAI-LA 2018a).

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Chapter 9.   Final Reflections

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This book has presented different aspects related to virtual education, while showing also the importance of educational proposals at regional level, emphasizing inclusion and accessibility as a structuring axis. It promotes the skills development in students and graduates to increase their employability, and enhancing the entrepreneurial innovation.

Integration and internationalization experiences developed by the ACAI-LA consortium are very relevant. In this sense, the ACAI-LA project provided a framework that has enabled concrete actions for its development.

Some of the ideas and reflections that emerged throughout the different topics addressed in the previous chapters will be presented in this final one. At the same time, we will propose guidelines for potential future research and work.

Students have been changing over time, and Higher Education (HE) must be reshaped and accompany these changes. This implies that new ICTs must be applied within the educational models and training strategies, not only as a teaching support, but as a transversal basis of knowledge development through innovative pedagogical models that reach the required competences of graduates. Thus, HE needs to adapt to the social requirements and needs, with ICT being the tools for these possible new approaches and transformative structures that facilitate their own integration.

The policies and guidelines that promote virtual education have managed to standardise their processes to offer quality systems to new users. In some countries, virtual education has progressed in an organized way, and it functions in its different variants within the HE

institutions. In Latin America, it is still pending its standardisation regarding international quality criteria are still pending.

In this regard, the creation of the ACAI-LA campus as a repository of a series of innovative, open and accessible courses has managed to reach vulnerable populations, favouring the University-Business-Graduates relationship, configuring a management strategy at the disposal of a network. The Master on Quality and Accessible Virtual Education developed in this framework stands out as one of its main products.

The design of this programme, in which all ACAI-LA consortium universities with teachers and multicultural students participated, favours the integration and connection among its members as an example that promotes Higher Education internationalization and integration.

The creation of educational resources or accessible learning objects allowed people with disabilities to make use of the training resources, achieving equal opportunities, making it understandable, usable, and practicable. To accomplish this, it is important to implement the use of the HEODAR tool for the learning objects validation, providing the appropriate criteria to generate quality and accessibility assessment tools, seeking to obtain inclusive courses for all beneficiaries.

Communication is an inherent process to every educational action – especially in virtual scenarios, in which pedagogical mediation is enhanced. Digital culture in Higher Education finds some common ground with the academic culture and traditional teaching-learning modalities, while cultural, institutional, and social influences should be taken into account. In this way, an ecology of the structured virtual education is set in different dimensions in which communication is preponderant.

Another important aspect to consider in virtual education is the teacher's role, who should try to break paradigms stuck on traditional models, but without ignoring its history and its pedagogical contribution. Enabling virtual tools implies different challenges for teachers, such as facing their own competences on these new languages, but above all it implies acknowledging reflexive pedagogical processes.

A potential impact of the programs developed with ICT is related to the relationship between Higher Education and the labour market. In Latin America, there is a mismatch between the

labour supply, labour demand, and the graduate skills. In many cases, HE has integrated into its curricula aspects that strengthen and consolidate entrepreneurship and innovation, bringing the business sectors closer, mainly SMEs, to shorten the distance between the academic and labour world. HE institutions need to develop tools to expedite the relationship with the business environment and to find links that support their financing.

In line with the above considerations, the institutions that participate in the ACAI-LA project support at least one program in this regard, progressing towards structured trainings supported by this relationship, in a transversal axis. These efforts are visible mainly in the areas of engineering training, followed by economic sciences.

Regarding internationalization, included in the penultimate chapter of this book, we observe that the aim is not only about providing financial resources for cooperation or training, but achieving strengthened local and regional institutions. This has as a result cooperation policies with a north-south-south approach and, in this sense, analysing the results revealed, the improvement of academic standards and the competencies of the graduates shows an evident important progress. The mentioned improvement keeps consolidating, as the effort continues, in order to achieve stakeholders who interact successfully in a globalized world. The agreements made between the universities of the ACAI-LA consortium and the activities carried out promote cooperation among peers, the exchange of knowledge and experiences, as well as their innovative potential.

In this scenario, the ACAI-LA project, in its short life, emerges as an outstanding stakeholder for the achievement of goals that arise as cooperative actions of HE networks. This leads to the achievement of changes and transformations that are seen as compelling in the Latin American scenario, in order to advance in models in which the incorporation of ICTs guarantees a virtual, accessible, open, and quality education.

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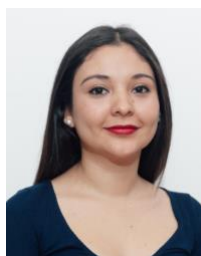
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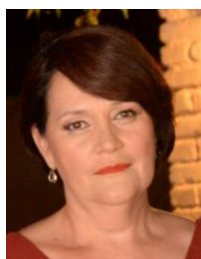
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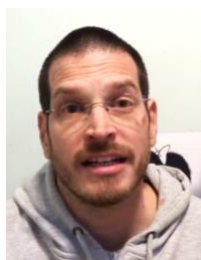
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