

# Professional Master's Degree Educational Research



## Professional Master's Degree Educational Research

- » Modality: online
- » Duration: 12 months
- » Certificate: TECH Global University
- » Credits: 60 ECTS
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/us/education/professional-master-degree/master-research-education](http://www.techtute.com/us/education/professional-master-degree/master-research-education)

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01

# Introduction

The Educational Research program addresses the theoretical bases of research in education, as well as advanced methods and techniques for the development of research in this area. This program is designed to provide access to the specific knowledge of this discipline in an intensive and practical way. Great value for any teacher who wants to incorporate the latest techniques in their classroom.





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*Incorporate new paradigms emerging from Educational Research into your knowledge through this Professional Master's Degree, created to propel you to another professional level"*



This Professional Master's Degree provides the necessary knowledge to train professionals in educational research. It delves into the reflection and methodological practices, emphasizing the latest developments in Educational Research.

This high level program provides students with the knowledge and tools necessary for the analysis of education and its links between research and renewing knowledge in this field.

Throughout this program, the students will study all the current approaches to Educational Research in the different challenges that arise in their profession as teachers.

Computer resources for research and instruments for data collection will be the topics of work and study that the students will be able to integrate in their specialization. A high level program that will become a process of improvement, not only on a professional level, but also on a personal level.

This challenge is one of TECH's social commitments: to help highly qualified professionals specialize and develop their personal, social and work skills during the course of their studies.

Not only does it teach students through the theoretical knowledge offered, but it also shows another way of studying and learning, which is more organic, simple and efficient. TECH works to keep you motivated and to create a passion for learning, driving you to think and develop critical thinking.

This **Professional Master's Degree in Educational Research** contains the most complete and up-to-date program on the market. The most important features include:

- ♦ The latest technology in online teaching software
- ♦ A highly visual teaching system, supported by graphic and schematic contents that are easy to assimilate and understand
- ♦ Practical cases presented by practising experts
- ♦ State-of-the-art interactive video systems
- ♦ Teaching supported by telepractice
- ♦ Continuous updating and recycling systems
- ♦ Autonomous learning: full compatibility with other occupations
- ♦ Practical exercises for self-evaluation and learning verification
- ♦ Support groups and educational synergies: questions to the expert, debate and knowledge forums
- ♦ Communication with the teacher and individual reflection work
- ♦ Content that is available from any fixed or portable device with an Internet connection
- ♦ Supplementary documentation databases that are permanently available, even after the program



*A program created for professionals who aspire for excellence, and that will enable you to acquire new skills and strategies easily and effectively"*

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*A detailed and complete immersion in the strategies and approaches that are developed in an educational research environment"*

Our teaching staff is made up of working professionals. In this way, TECH ensure that we provide you with the up-to-date information we are aiming for. A multidisciplinary team of trained and experienced specialists from different fields, who will develop the theoretical knowledge efficiently, but, above all, will contribute to the program the practical knowledge derived from their own experience: one of the differential qualities of this Professional Master's Degree.

This mastery of the subject is complemented by the effectiveness of the methodology used in the design of this Professional Master's Degree. Developed by a multidisciplinary team of e-learning experts, it integrates the latest advances in educational technology. In this way, you will be able to study with a range of comfortable and versatile multimedia tools that will give you the operability you need in your learning.

The design of this program is based on Problem-Based Learning: an approach that conceives learning as a highly practical process. To achieve this remotely, we will use online learning: with the help of an innovative interactive video system, and Learning from an Expert, you will be able to acquire the knowledge as if you were actually dealing with the scenario you are learning about. A concept that will allow you to integrate and consolidate your learning in a more realistic and permanent way.

*Achieve professional success with this high-level specialization.*

*Learn the latest approaches to the basic processes of cognitive development and how they relate to learning and school development, in an intensive and comprehensive program.*



# 02

# Objectives

The objective is to prepare highly qualified professionals for the working world. An objective that is complemented, moreover, in a global manner, by promoting human development that lays the foundations for a better society. This objective is focused on helping professionals reach a much higher level of expertise and control. A goal that, in just a few months, can be achieved with this high intensity and accurate program.





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*If your goal is to improve in your profession, to acquire a qualification that will enable you to compete among the best, look no further: welcome to TECH”*



## General objectives

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- Qualify professionals for the carrying out Educational Research
- Learn how to carry out specific programs to improve school performance
- Gain access to the forms and processes of Educational Research in the school environment
- Analyze and integrate the knowledge necessary to foster students' school and social development



*Make the most of this opportunity and take the step to get up to date on the latest developments in Educational Research"*







## Specific objectives

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### Module 1. Fundamentals, Processes and Methods in Research

- ♦ Determine the elements and sequence that should be followed in the methodological design of educational research, in order to frame it within the scientific procedure
- ♦ Know and work on basic concepts of descriptive statistics
- ♦ Become familiar with univariate and bivariate descriptive statistics
- ♦ Acquire skills and interpret a frequency table, a bar chart and some descriptive indexes
- ♦ Analyze and interpret qualitative data
- ♦ Acquire skills and interpret contingency tables as a tool for descriptive analysis of the relationship between variables

### Module 2. Experimental Research: Design as a Model

- ♦ Know and be able to apply experimental scientific methodology in research
- ♦ Know how to carry out an experimental investigation, following the appropriate phases and using the correct approach
- ♦ Differentiate between the various experimental designs and be able to apply them correctly
- ♦ Know the experimental rigor
- ♦ Correctly analyze and contrast the data obtained in the empirical setting

### Module 3. Techniques and Instruments for Data Collection in Qualitative Research

- ♦ Know the techniques for categorizing, analyzing and summarizing qualitative information
- ♦ Know the quality of the instruments
- ♦ Adequately record the information obtained through the observation technique
- ♦ Know the ethics of qualitative information

#### Module 4. Educational Research Computer Resources

- ♦ Apply criteria to assess information
- ♦ Ensure the ethical and legal use of information
- ♦ Know the process of scientific publication
- ♦ Communicate and disseminate information
- ♦ Manage computer resources for quantitative data
- ♦ Manage computer resources for qualitative data

#### Module 5. Data Collection and Measurement Techniques and Instruments

- ♦ Learn basic psychometric concepts
- ♦ Know the research process
- ♦ Acquire skills for the collection of information using quantitative techniques
- ♦ Acquire knowledge for the process of elaboration of instruments
- ♦ Learn how to analyze the reliability and validity of an instrument

#### Module 6. Item Response Theory

- ♦ Be familiar with IRT for the development and study of the data collection instrument
- ♦ Introduce the student to the basic concepts of IRT
- ♦ Know the different models for item analysis
- ♦ Analyze the quality of measurement instruments through the IRT premises
- ♦ Apply this theory to other measurement processes in education







### **Module 7. Multivariate Analysis**

- ◆ Become familiar with Multivariate Analysis
- ◆ Know the models of techniques and procedures that study the interrelationships between variables
- ◆ Be able to describe the pattern of behavior of the observed variables
- ◆ Study the differences between groups
- ◆ Interpret Contingency Tables
- ◆ Know how to apply the techniques that comprise multivariate interdependence models

### **Module 8. Direction of Thesis and Scientific Research, Guidance to University Students**

- ◆ Acquire the resources to carry out not only effective, but also enjoyable and motivating work
- ◆ Discover the importance of motivation and orientation of students interested in investigation
- ◆ Acquire the knowledge and practical tools to carry out research guidance with complete confidence

### **Module 9. Innovation, Diversity and Equity in Education**

- ◆ Focus your knowledge on innovation, diversity and equity in education
- ◆ Learn to implement innovative educational plans in your respective centers and classrooms

### **Module 10. Talent, Vocation, and Creativity**

- ◆ Identify what talent is
- ◆ List the characteristics of talent

# 03 Skills

Once all the contents have been studied and the objectives of the Professional Master's Degree in Educational Research have been achieved, the professional will have superior competences and better performance in this area. A very complete approach, in a high-level program, which makes the difference.





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*Achieving excellence requires effort and perseverance, but, above all, the support of professionals who provide you with the drive you need, with the necessary means and support. Just what TECH offers you"*





## General skills

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- Carry out research in the educational environment
- Apply modes of educational research

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*Our objective is very simple: to offer you quality learning, with the best teaching system currently available, so that you can incorporate new knowledge and skills to your profession"*







## Specific Skills

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- ♦ Handle specific computer programs in the field which will help to analyze and interpret the results obtained through research
- ♦ Apply the correct statistical analysis for each type of design
- ♦ Identify and use information collection instruments appropriately
- ♦ Apply criteria to assess information
- ♦ Handle and interpret the scores of a psychometric test
- ♦ Know how to apply the different models for item analysis
- ♦ Know how to apply the techniques that comprise multivariate interdependence models
- ♦ Direct and guide students with an interest in scientific research
- ♦ Provide the student with all the necessary material to study through a series of activities for reflection, research and inquiry

# 04

## Structure and Content

The contents of this program have been developed by the different teachers of this program with a clear purpose: to ensure that our students acquire each and every one of the skills required to become true experts in this field. The content of this Professional Master's Degree will allow you to learn all aspects of the different disciplines involved in this area. A comprehensive and well-structured program that will lead to the highest standards of quality and success.



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*Through a complete but very well compartmentalized development, you will be able to access the most advanced knowledge in Educational Research of the moment"*



## Module 1. Fundamentals, Processes and Methods in Research

- 1.1. Methodological Design of Educational Research
  - 1.1.1. Introduction
  - 1.1.2. Approaches or Paradigms in Educational Research
  - 1.1.3. Types of Research
    - 1.1.3.1. Basic or Fundamental Research
    - 1.1.3.2. Applied Research
    - 1.1.3.3. Descriptive or Interpretative Research
    - 1.1.3.4. Prospective Research
    - 1.1.3.5. Exploratory Research
  - 1.1.4. The Research Process: The Scientific Method
- 1.2. Statistical Data Analysis
  - 1.2.1. Introduction
  - 1.2.2. What is Data Analysis?
  - 1.2.3. Types of Variables
  - 1.2.4. Measuring Scales
- 1.3. Univariate Descriptive Statistics (I): Distribution and Polygon of Frequencies
  - 1.3.1. Introduction
  - 1.3.2. Frequency Distribution
  - 1.3.3. Frequency Polygons or Histograms
  - 1.3.4. SPSS: Frequencies
- 1.4. Univariate Descriptive Statistics (II): Position Indexes and Dispersion Indexes
  - 1.4.1. Introduction
  - 1.4.2. Variables and Types
  - 1.4.3. Position or Central Tendency Indices and their Properties
    - 1.4.3.1. Arithmetic Mean
    - 1.4.3.2. Median
    - 1.4.3.3. Mode
  - 1.4.4. Dispersion or Variability Indexes
    - 1.4.4.1. Variance
    - 1.4.4.2. Standard Deviation
    - 1.4.4.3. Coefficient of Variation
    - 1.4.4.4. Semiquartile Amplitude
    - 1.4.4.5. Total Amplitude





- 1.5. Univariate Descriptive Statistics (III): Scores and Index of the Shape of the Distribution
  - 1.5.1. Introduction
  - 1.5.2. Types of Scores
    - 1.5.2.1. Differential Score
    - 1.5.2.2. Typical Score
    - 1.5.2.3. Centile Score
  - 1.5.3. Distribution Shape Index
    - 1.5.3.2. Asymmetry Index (AS)
    - 1.5.3.3. Kurtosis Index (Cv)
- 1.6. Exploratory Data Analysis (EDA)
  - 1.6.1. Introduction
  - 1.6.2. Definition of Exploratory Data Analysis
  - 1.6.3. Stages of Exploratory Data Analysis
  - 1.6.4. SPSS: Exploratory Data Analysis
- 1.7. Linear Correlation Between Two Variables (X and Y)
  - 1.7.1. Introduction
  - 1.7.2. Concept of Correlation
  - 1.7.3. Types and Correlation Coefficients
  - 1.7.4. Pearson's Correlation Coefficient (r<sub>xy</sub>)
  - 1.7.5. Properties of Pearson's Correlation
  - 1.7.6. SPSS: Correlation Analysis
- 1.8. Introduction to Regression Analysis
  - 1.8.1. Introduction
  - 1.8.2. General Concepts: The Regression Equation of Y on X
  - 1.8.3. Model Goodness-of-Fit Index (GFI)
  - 1.8.4. SPSS: Linear Regression Analysis
- 1.9. Introduction to Inferential Statistics (I)
  - 1.9.1. Introduction
  - 1.9.2. Probability: General Concept
  - 1.9.3. Contingency Tables in Independent Events
  - 1.9.4. Theoretical Probability Models with Continuous Variables
    - 1.9.4.1. Normal Distribution
    - 1.9.4.2. Student's T Distribution

- 1.10. Introduction to Inferential Statistics (II)
  - 1.10.1. Introduction
  - 1.10.2. Theoretical Probability Models with Continuous Variables
  - 1.10.3. Sample Distribution
  - 1.10.4. The Logic of Hypothesis Testing
  - 1.10.5. Type I and II Errors

## Module 2. Experimental Research: Design as a Model

- 2.1. Experimental Method
  - 2.1.1. Introduction
  - 2.1.2. Approaches or Paradigms from Educational Research
  - 2.1.3. Concept of Experimental Research
  - 2.1.4. Types of Research
  - 2.1.5. Research Approach
  - 2.1.6. Quality of a Research: Kerlinger's Principle (Max-Min-Con)
  - 2.1.7. Experimental Validity of a Research
- 2.2. Experimental Design in Research
  - 2.2.1. Introduction
  - 2.2.2. Types of Experimental Designs: Pre-Experimental, Experimental and Quasi-Experimental
    - 2.2.3. Experimental Control
      - 2.2.3.1. Controlling Variables
      - 2.2.3.2. Control Techniques
      - 2.2.3.3. Experimental Design: Between-Group and Within-Subject Design
      - 2.2.3.4. Data Analysis: Statistical Techniques
- 2.3. Experimental Design with Different Subject Groups
  - 2.3.1. Introduction
  - 2.3.2. Approaches or Paradigms from Educational Research
  - 2.3.3. Concept of Experimental Research
  - 2.3.4. Types of Research
  - 2.3.5. Research Approach
  - 2.3.6. Quality of a Research, Kerlinger's Principle (Max-Min-Con)
  - 2.3.7. Validity of a Research

- 2.4. Experimental Design with the Same Subjects
  - 2.4.1. Introduction
  - 2.4.2. Student's T-Test with the Same Subjects
  - 2.4.3. Non-parametric Contrasts for Two Related Samples: Wilcoxon Test
  - 2.4.4. Non-parametric Contrasts for More than Two Related Samples: Friedman's Test
- 2.5. One-factor Completely Randomized Experimental Design
  - 2.5.1. Introduction
  - 2.5.2. The General Linear Model
  - 2.5.3. Anova Models
  - 2.5.4. One-factor, Fixed-effects, Completely Randomized Anova (A-FE-CR)
    - 2.5.4.1. The Model
    - 2.5.4.2. The Assumptions
    - 2.5.4.3. The Contrast Statistic
  - 2.5.5. Measures of Effect Size
  - 2.5.6. Multiple Comparisons between Measurements
    - 2.5.6.1. What are Multiple Comparisons?
    - 2.5.6.2. A Priori Planned Comparisons
    - 2.5.6.3. A Posteriori Planned Comparisons
- 2.6. One-Factor Repeated Measures Experimental Design
  - 2.6.1. Introduction
  - 2.6.2. One-Factor, Fixed-Effects, Completely Randomized Anova (A-FE-CR)
  - 2.6.3. Measures of Effect Size
  - 2.6.4. Multiple Comparisons
    - 2.6.4.1. Orthogonal Planned Comparisons: Planned F Tests
- 2.7. Completely Randomized Two-Factor Experimental Design
  - 2.7.1. Introduction
  - 2.7.2. Two-Factor, Fixed-Effect, Completely Randomized Anova (AB-FE-CA)
  - 2.7.3. Measures of Effect Size
  - 2.7.4. Multiple Comparisons
- 2.8. Two-Factor Repeated Measures Experimental Design
  - 2.8.1. Introduction
  - 2.8.2. Two-Factor, Fixed-Effects Anova with Repeated Measurements on the Two Factors
  - 2.8.3. Multiple Comparisons
  - 2.8.4. Two-Factor, Fixed-Effects, Anova with Repeated Measurements on a Single Factor
  - 2.8.5. Multiple Comparisons
- 2.9. Block Experimental Design
  - 2.9.1. Introduction
  - 2.9.2. Characteristics of Block Designs
  - 2.9.3. Additional Variables to the Factor: The Blocking Factor
  - 2.9.4. One-Factor Blocking Design: Completely Randomized Blocking
  - 2.9.5. Two-Factor Blocking Design: Latin Square Blocking
- 2.10. Experimental Design with Covariate Variables
  - 2.10.1. Introduction
  - 2.10.2. ANCOVA Design
    - 2.10.2.1. Covariate Variables to Reduce the Error Term
    - 2.10.2.2. Covariate Variables to Control Extraneous Variables
  - 2.10.3. Why Include a Covariate Variable in the Design?
  - 2.10.4. Blocking and ANCOVA
- 2.11. Single Case Experimental Design (N=1)
  - 2.11.1. Introduction
  - 2.11.2. Basic Structure of Single-Case Designs
    - 2.11.2.1. Elaboration of Multiple-Choice Items
    - 2.11.2.2. Difficulty Index, Discrimination Index, Validity Index
    - 2.11.2.3. Analysis of Distractor Items
  - 2.11.3. Treatment Study in Single Case Design
    - 2.11.3.1. Visual Data Analysis
  - 2.11.4. Basic Model: A-B
  - 2.11.5. A-B-A Design
  - 2.11.5. Criteria Change Design
  - 2.11.7. Multiple Baseline Design

**Module 3. Techniques and Instruments for Data Collection in Qualitative Research**

- 3.1. Introduction
  - 3.1.1. Qualitative Research Methodology
  - 3.1.2. Qualitative Research Techniques
  - 3.1.3. Phases of Qualitative Research
- 3.2. Observation
  - 3.2.1. Introduction
  - 3.2.2. Observation Categories
  - 3.2.3. Types of Observation: Ethnographic, Participant and Non-Participant
  - 3.2.4. What, How and When to Observe?
  - 3.2.5. Ethical Considerations of Observation
  - 3.2.6. Content Analysis
- 3.3. Interview Techniques
  - 3.3.1. Introduction
  - 3.3.2. Interview Concept
  - 3.3.3. Interview Features
  - 3.3.4. Interview Objectives
  - 3.3.5. Types of Interviews
  - 3.3.6. Advantages and Disadvantages of the Interview
- 3.4. Discussion Group and Focus Group Techniques
  - 3.4.1. Introduction
  - 3.4.2. Discussion Groups
  - 3.4.3. Objectives that can be Considered: Advantages and Disadvantages
  - 3.4.4. Issues to be Discussed
- 3.5. SWOT and DELPHI Techniques
  - 3.5.1. Introduction
  - 3.5.2. Characteristics of Both Techniques
  - 3.5.3. SWOT Technique
  - 3.5.4. DELPHI Technique
  - 3.5.5. Preliminary Tasks Before Starting a DELPHI
- 3.6. Life History Method
  - 3.6.1. Introduction
  - 3.6.2. Life History
  - 3.6.3. Characteristics of the Method
  - 3.6.4. Types
  - 3.6.5. Phases
- 3.7. Field Diary Method
  - 3.7.1. Introduction
  - 3.7.2. Concept of Field Diary
  - 3.7.3. Field Diary Characteristics
  - 3.7.4. Structure of the Field Diary
- 3.8. Discourse and Image Analysis Technique
  - 3.8.1. Introduction
  - 3.8.2. Features
  - 3.8.3. Discourse Analysis Concept
  - 3.8.4. Discourse Analysis Types
  - 3.8.5. Levels of Discourse
  - 3.8.6. Image Analysis
- 3.9. The Case Study Method
  - 3.9.1. Introduction
  - 3.9.2. Concept of Case Studies
  - 3.9.3. Types of Cases Study
  - 3.9.4. Design of the Cases Study
- 3.10. Classification and Analysis of Qualitative Data
  - 3.10.1. Introduction
  - 3.10.2. Data Categorization
  - 3.10.3. Data Coding
  - 3.10.4. Theorizing of Data
  - 3.10.5. Data Triangulation
  - 3.10.6. Exposure of Data
  - 3.10.7. Writing Analytical Reflections. Memoing

## Module 4. Educational Research Computer Resources

- 4.1. Documentary Resources in Educational Research
  - 4.1.1. Introduction
  - 4.1.2. Introduction of Documentary Resources in Educational Research
  - 4.1.3. Dissemination and Communication of Scientific and Academic Information
  - 4.1.4. Academic Scientific Language
  - 4.1.5. Access to Information: Bibliographic Databases
- 4.2. Information Search and Retrieval
  - 4.2.1. Introduction
  - 4.2.2. Information Search
  - 4.2.3. Information Search Strategies: Interfaces
  - 4.2.4. Search for Electronic Journals
  - 4.2.5. Bibliographic Databases
- 4.3. Access to Information Sources
  - 4.3.1. Introduction
  - 4.3.2. Databases
  - 4.3.3. Electronic Journals
  - 4.3.4. Institutional Repositories
  - 4.3.5. Scientific Social Networks
  - 4.3.6. Information Managers
- 4.4. Thesaurus
  - 4.4.1. Introduction
  - 4.4.2. Concept of Thesaurus
  - 4.4.3. Characteristics of Thesaurus
  - 4.4.4. Terminology of Thesaurus
- 4.5. Thesaurus: Database Usage
  - 4.5.1. Introduction
  - 4.5.2. Thesaurus Nomenclature
  - 4.5.3. Thesaurus Hierarchy
  - 4.5.4. Databases
- 4.6. Information Assessment Criteria
  - 4.6.1. Introduction
  - 4.6.2. Criteria for Assessing Bibliographic Sources
  - 4.6.3. Bibliometric Indicators
  - 4.6.4. Book Assessment and Publisher Ranking
- 4.7. Communication of Information
  - 4.7.1. Introduction
  - 4.7.2. Academic Scientific Language
  - 4.7.3. Communication of Information
  - 4.7.4. The Scientific Publication Process
- 4.8. SPSS (I)-Statistical Computing Tool Quantitative Data
  - 4.8.1. Introduction
  - 4.8.2. Introduction to SPSS
  - 4.8.3. Structure of SPSS
  - 4.8.4. How to Handle Data Files?
- 4.9. SPSS (II)- Descriptive Analysis of Variables
  - 4.9.1. Introduction
  - 4.9.2. Menu Bar and SPSS Tools
  - 4.9.3. Create New Files
  - 4.9.4. How to Define a Variable
- 4.10. Computer Resources, Qualitative Data
  - 4.10.1. Introduction
  - 4.10.2. Programs and Resources for Qualitative Data Collection
  - 4.10.3. Computer Resources for Analyzing Qualitative Data
  - 4.10.4. Other Programs for Data Analysis



**Module 5. Data Collection and Measurement Techniques and Instruments**

- 5.1. Measurement in Research
  - 5.1.1. Introduction
  - 5.1.2. What Do We Want to Measure?
  - 5.1.3. Subject Measurement Process
  - 5.1.4. Psychometry
- 5.2. Collection of Information with Quantitative Techniques: Observation and Surveys
  - 5.2.1. Introduction
  - 5.2.2. Observation
    - 5.2.2.1. Theoretical Framework and Categories of Observation
  - 5.2.3. The Survey
    - 5.2.3.1. Material for Conducting a Survey
    - 5.2.3.2. Survey Research Design
- 5.3. Collection of Information with Quantitative Techniques: Tests
  - 5.3.1. Introduction
  - 5.3.2. Test Concept
  - 5.3.3. Item Generation Process
  - 5.3.4. Testing by Area: Performance; Intelligence and Aptitude; Personality, Attitudes and Interests
- 5.4. Collection of Information with Quantitative Techniques: Scale Methods
  - 5.4.1. Introduction
  - 5.4.2. Concept of Attitude Scales
  - 5.4.3. Thurstone Method
    - 5.4.3.1. Method of Paired Comparisons
  - 5.4.4. Likert Scale
  - 5.4.5. Guttman Scale
- 5.5. Test Construction Process
  - 5.5.1. Introduction
  - 5.5.2. Item Scaling Process
    - 5.5.2.1. Item Generation Process
    - 5.5.2.2. Information Gathering Process
    - 5.5.2.3. Scaling Process in the Strict Sense
  - 5.5.3. Scale Assessment Process
    - 5.5.3.1. Item Analysis
    - 5.5.3.2. Scale Dimension
    - 5.5.3.3. Scale Reliability
    - 5.5.3.4. Scale Validity
  - 5.5.4. Subject's Scores on the Scale
- 5.6. Analysis of Test Items
  - 5.6.1. Introduction
  - 5.6.2. Classical Test Theory (Spearman, 1904)
  - 5.6.3. Test Reliability
  - 5.6.4. The Concept of Validity
  - 5.6.5. Evidence of Validity
- 5.7. Instrument Reliability
  - 5.7.1. Introduction
  - 5.7.2. Definition of Reliability
  - 5.7.3. Reliability by Test-Retest or Repeatability Method
  - 5.7.4. Reliability by the Alternate or Parallel Form Method
  - 5.7.5. Reliability through Internal Consistency Coefficients
    - 5.7.5.1. Kuder-Richardson Coefficient
    - 5.7.5.2. Cronbach's Alpha Coefficient
- 5.8. Instrument Validity
  - 5.8.1. Introduction
  - 5.8.2. Validity Definition
  - 5.8.3. Validity of Instruments
    - 5.8.3.1. Immediate Validity
    - 5.8.3.2. Content Validity
    - 5.8.3.3. Construct Validity
    - 5.8.3.4. Contrast Validity
  - 5.8.4. Validity Strategies
- 5.9. Item Analysis
  - 5.9.1. Introduction
  - 5.9.2. Item Analysis
  - 5.9.3. Difficulty and Validity Indexes
  - 5.9.4. Correction of Random Effects

- 5.10. Interpretation of Test Scores
  - 5.10.1. Introduction
  - 5.10.2. Interpretation of Scores
  - 5.10.3. Normative Test Scales
  - 5.10.4. Typical Derived Scales
  - 5.10.5. Interpretations Referring to the Criteria

## Module 6. Item Response Theory (IRT)

- 6.1. Item Response Theory (IRT)
  - 6.1.1. Introduction
  - 6.1.2. Measurement Models
  - 6.1.3. Fundamental Concepts of IRT
  - 6.1.4. Basic Postulates of IRT
- 6.2. Generalizability Theory (GT)
  - 6.2.1. Introduction
  - 6.2.2. Generalizability Theory (GT)
  - 6.2.3. Facets of Generalizability Theory
  - 6.2.4. Interpretation of Results in a Study
- 6.3. Characteristics of IRT (I)
  - 6.3.1. Introduction
  - 6.3.2. Historical Introduction to IRT
  - 6.3.3. IRT Assumptions
  - 6.3.4. IRT Models
- 6.4. Characteristics of IRT (II)
  - 6.4.1. Introduction
  - 6.4.2. IRT Results
    - 6.4.2.1. Parameters
    - 6.4.2.2. Item Characteristic Curve
    - 6.4.2.3. True Score
    - 6.4.2.4. Test Characteristic Curve
    - 6.4.2.5. Level of Information
  - 6.4.3. Response Models: The Item Characteristic Curve
  - 6.4.4. Question Selection Methods
- 6.5. Response Models for Dichotomous Items: The Rasch Contribution
  - 6.5.1. Introduction
  - 6.5.2. The Rasch Model
  - 6.5.3. Characteristics of the Rasch Model
  - 6.5.4. Example (Rasch Model)
- 6.6. Response Models for Dichotomous Items: Logistic Models
  - 6.6.1. Introduction
  - 6.6.2. Birnbaum's Logistic Model (1968)
  - 6.6.3. Model Parameters
    - 6.6.3.1. 2-Parameter Logistic Model
    - 6.6.3.2. 3-Parameter Logistic Model
    - 6.6.3.3. 4-Parameter Logistic Model
- 6.7. Response Models for Polytomous Items: Nominal Item Models (Block, 1972)
  - 6.7.1. Introduction
  - 6.7.2. Polytomous Items
  - 6.7.3. Nominal Response Models (Block, 1972)
  - 6.7.4. Political Item Parameters
- 6.8. Response Models for Polytomous Items: Ordinal Item Models
  - 6.8.1. Introduction
  - 6.8.2. Ordinal Item Models
  - 6.8.3. Ordinal Cumulative Model
    - 6.8.3.1. Samejima's Graded Response Model (GRM) (1969)
    - 6.8.3.2. Muraki's Modified Graded Response Model (M-GRM) (1990)
  - 6.8.4. Ordinal Continuous Model
    - 6.8.4.1. Sequential Model (Tutz, 1990)
  - 6.8.5. Adjacent Ordinal Models
    - 6.8.5.1. Partial Credit Model (Masters, 1982)
- 6.9. Response Model for Polytomous Items: Samejima's Graded Response Model (1969)
  - 6.9.1. Introduction
  - 6.9.2. Normal Graded Response Model
  - 6.9.3. Logistics Graded Response Model
  - 6.9.4. Example (Graduated Response Model)

- 6.10. Differential Item Functioning (DIF)
  - 6.10.1. Introduction
  - 6.10.2. Item Differential Concept (DIF)
  - 6.10.3. Types of DIF
  - 6.10.4. DIF Screening Methods
  - 6.10.5. Purification Methods

## Module 7. Multivariate Analysis

- 7.1. Multivariate Analysis
  - 7.1.1. Introduction
  - 7.1.2. What is Multivariate Analysis?
  - 7.1.3. The Objectives of Multivariate Analysis
  - 7.1.4. Classification of Multivariate Techniques
- 7.2. Multiple Linear Regression
  - 7.2.1. Introduction
  - 7.2.2. Concept of Multiple Linear Regression
  - 7.2.3. Conditions for Multiple Linear Regression
  - 7.2.4. Predictors to Generate the Best Model
- 7.3. Binary Logistic Regression
  - 7.3.1. Introduction
  - 7.3.2. Binary Logistic Regression Concept
  - 7.3.3. Model Adjustment
    - 7.3.3.1. Model Adjustment in R
  - 7.3.4. R Stages
  - 7.3.5. Example (Binary Logistic Regression)
- 7.4. Nominal and Ordinal Logistic Regression
  - 7.4.1. Introduction
  - 7.4.2. General Review of Nominal Logistic Regression
  - 7.4.3. Example (Nominal Logistic Regression)
  - 7.4.4. General Review of Ordinal Logistic Regression
  - 7.4.5. Example (Ordinal Logistic Regression)
- 7.5. Poisson Regression
  - 7.5.1. Introduction
  - 7.5.2. Poisson Concept
  - 7.5.3. Distribution Functions
  - 7.5.4. Poisson Regression with Counts
- 7.6. Log-Linear Models
  - 7.6.1. Introduction
  - 7.6.2. Log-Linear Models for Contingency Tables
  - 7.6.3. Log-Linear Models for Three-Dimensional Tables
  - 7.6.4. Example (Log-Linear Models for Contingency Tables)
- 7.7. Discriminant Analysis
  - 7.7.1. Introduction
  - 7.7.2. Discriminant Analysis Concept
  - 7.7.3. Classification with Two Groups
    - 7.7.3.1. Fisher Discriminant Function
  - 7.7.4. Example (Discriminant Analysis)
- 7.8. Cluster Analysis
  - 7.8.1. Introduction
  - 7.8.2. Concept of K-Mean Clusters
  - 7.8.3. Hierarchical Cluster Analysis Concept
  - 7.8.4. Example (Hierarchical Cluster Analysis)
- 7.9. Multidimensional Scaling
  - 7.9.1. Introduction
  - 7.9.2. Multidimensional Scaling: Basic Concepts
  - 7.9.3. The Similarity Matrix
  - 7.9.4. Classification of Scaling Techniques
- 7.10. Factor Analysis
  - 7.10.1. Introduction
  - 7.10.2. When is Factor Analysis Used?
  - 7.10.3. Factor Analysis Methodology
  - 7.10.4. Factor Analysis Applications

## Module 8 Direction of Thesis and Scientific Research, Guidance to University Students

- 8.1. Motivating University Students to Get Involved in Research
  - 8.1.1. Introduction to Investigative Practice
  - 8.1.2. Gnoseology or Theory of Knowledge
  - 8.1.3. Scientific Research and its Foundations
  - 8.1.4. Research-Oriented Motivation
- 8.2. Basic Student Training for Research Activity
  - 8.2.1. Initiation in Research Methods and Techniques
  - 8.2.2. Elaboration of Quotes and Bibliographic References
  - 8.2.3. The Use of New Technologies in Information Searching and Management
  - 8.2.4. Research Reports: Structure, Characteristics and Standards  
of Development
- 8.3. Requirements for the Management of Research Projects
  - 8.3.1. Initial Guidance for Research Practice
  - 8.3.2. Responsibilities in the Supervision of Theses and Research Projects
  - 8.3.3. Introduction to Scientific Literature
- 8.4. The Approach to the Topic and the Study of the Theoretical Framework
  - 8.4.1. The Research Topic
  - 8.4.2. Objectives of the Research
  - 8.4.3. Document Sources and Research Techniques
  - 8.4.4. Structure and Boundaries of the Theoretical Framework
- 8.5. Research Designs and the Hypothesis System
  - 8.5.1. Types of Studies in Research
  - 8.5.2. Research Designs
  - 8.5.3. Hypothesis: Types and Characteristics
  - 8.5.4. Variables in Research
- 8.6. Research Methods, Techniques and Instruments
  - 8.6.1. Population and Sample
  - 8.6.2. Sampling
  - 8.6.3. Methods, Techniques and Instruments

- 8.7. Planning and Supervision of Student Activity
  - 8.7.1. Research Plan Development
  - 8.7.2. Research Activity Document
  - 8.7.3. Schedule of Activities
  - 8.7.4. Supervision and Monitoring of the Students
- 8.8. Supervising Scientific Research Projects
  - 8.8.1. Promoting Research Activity
  - 8.8.2. Encouragement and Creation of Opportunities for Enrichment
  - 8.8.3. Resources and Presentation Techniques
- 8.9. The Management of Final Master Thesis (FMT) and Doctoral Thesis
  - 8.9.1. Management of Theses and Professional Master's Degree Theses as Pedagogical Practice
  - 8.9.2. Support and Career Planning
  - 8.9.3. Characteristics and Structures of Final Master Thesis
  - 8.9.4. Characteristics and Structures of Doctoral Theses
- 8.10. Commitment to the Dissemination of Results: The True Impact of Scientific Research
  - 8.10.1. The Use of Research as a Tool to Achieve Specific Goals
  - 8.10.2. The Significant Impact of Research Activity
  - 8.10.3. The By-Products of Research Projects
  - 8.10.4. Dissemination and Diffusion of Knowledge

## Module 9 Innovation, Diversity and Equity in Education

- 9.1. What Do We Mean by Educational Innovation?
  - 9.1.1. Definition
  - 9.1.2. Why is Educational Innovation Important?
  - 9.1.3. How Can We Be Innovative?
  - 9.1.4. Should We Be Innovative?
- 9.2. Diversity, Equity and Equal Opportunity
  - 9.2.1. Definition of Concepts
  - 9.2.2. Three Essential Elements in Education
- 9.3. Innovation and Educational Improvement
  - 9.3.1. Innovation Process
  - 9.3.2. Efficiency and Educational Improvement

- 9.4. Innovation for Achieving Equality in Education
  - 9.4.1. How to Explain Equality
  - 9.4.2. Equality in Education: A Persistent Problem
  - 9.4.3. Factors for Achieving Equality in the Classroom: Examples in the Classroom
- 9.5. Non-Sexist Teaching and Language
  - 9.5.1. What is Non-Sexist Language?
  - 9.5.2. What is Sexism in Language?
  - 9.5.3. What is Inclusive Language?
  - 9.5.4. Examples of Sexist and Non-Sexist Language in Education
- 9.6. Factors that Favor and Hinder Innovation
  - 9.6.1. Factors that Favor Innovation
  - 9.6.2. Factors that Hinder Innovation
- 9.7. Characteristics of Innovative Schools
  - 9.7.1. What is an Innovative School?
  - 9.7.2. Innovative Schools, a Different Education
  - 9.7.3. Elements of an Innovative School
  - 9.7.4. The Keys to an Innovative Classroom
- 9.8. Process of Educational Innovation
  - 9.8.1. The 21st Century School
- 9.9. Resources and Innovation Teaching Programs
  - 9.9.1. Distinct Innovation Programs Which Can Be Used in the Classroom
  - 9.9.2. Teaching Resources for an Innovative Classroom
- 9.10. Emerging Fields in the Teaching
  - 9.10.1. Emerging Pedagogies
  - 9.10.2. Emerging Needs of Students
  - 9.10.3. ICT as an Emerging Resource in Teaching
  - 9.10.4. Different ICT Tools to Use in the Classroom

## Module 10 Talent, Vocation, and Creativity

- 10.1. Talent and its Educational Importance
  - 10.1.1. Talent
  - 10.1.2. Components
  - 10.1.3. Talent is Diverse
  - 10.1.4. Measuring and Discovering Talent
  - 10.1.5. Gallup Test
  - 10.1.6. Garp Test
  - 10.1.7. CareerScope
  - 10.1.8. MBTI
  - 10.1.9. Success DNA
- 10.2. Talent and Key Competencies
  - 10.2.1. Key Competencies Paradigm
  - 10.2.2. Key Competencies
  - 10.2.3. The Role of the Intelligences
  - 10.2.4. Knowledge: Uses and Abuses in Education
  - 10.2.5. The Importance of Skills
  - 10.2.6. The Differentiating Factor of Attitude
  - 10.2.7. Relationship between Talent and Key Competencies
- 10.3. Talent Development
  - 10.3.1. Learning Modalities. Richard Felder
  - 10.3.2. The Element
  - 10.3.3. Talent Development Procedures
  - 10.3.4. Mentor Dynamics
  - 10.3.5. Talent and Educational Approach



- 10.4. Motivation Mechanisms
  - 10.4.1. Needs, Desires and Motivations
  - 10.4.2. Decision Making
  - 10.4.3. Executive Capabilities
  - 10.4.4. Procrastination
  - 10.4.5. Duty, Love and Pleasure in Education
  - 10.4.6. Emotional Habits for Motivation
  - 10.4.7. Motivational Beliefs
  - 10.4.8. Values for Motivation
- 10.5. Vocation, Meaning and Purpose
  - 10.5.1. The Importance of Vocation
  - 10.5.2. Meaning and Purpose
  - 10.5.3. Vision, Mission, Commitment
  - 10.5.4. Exploring Vocation
  - 10.5.5. Teaching Vocation
  - 10.5.6. Educating for Vocation
- 10.6. Towards a Definition of Creativity
  - 10.6.1. Creativity
  - 10.6.2. Brain Functioning and Creativity
  - 10.6.3. Intelligences, Talents and Creativity
  - 10.6.4. Emotions and Creativity
  - 10.6.5. Beliefs and Creativity
  - 10.6.6. Divergent Thinking
  - 10.6.7. Convergent Thinking
  - 10.6.8. The Creative Process and its Phases
  - 10.6.9. Disney Dynamics
- 10.7. Why Creativity?
  - 10.7.1. Arguments in Favor of Creativity Today
  - 10.7.2. Personal Creativity for Life
  - 10.7.3. Creativity in Art
  - 10.7.4. Creativity for Problem Solving
  - 10.7.5. Creativity for Professional Development
  - 10.7.6. Creativity in the Coaching Process





- 10.8. Creativity Development
  - 10.8.1. Conditions for Creativity
  - 10.8.2. Artistic Disciplines as Precursors of Creativity
  - 10.8.3. The Art Therapy Approach
  - 10.8.4. Creativity Applied to Challenges and Problem Solving
  - 10.8.5. Relational Thinking
  - 10.8.6. Edward de Bono's Hats
- 10.9. Creativity as a Value in Education
  - 10.9.1. The Need to Encourage Creativity in Education
  - 10.9.2. Active Methodologies and Novelty
  - 10.9.3. Educational Models that Value Creativity
  - 10.9.4. Means, Times and Spaces to Apply Creativity in the Classroom
  - 10.9.5. Disruptive Education
  - 10.9.6. Visual Thinking
  - 10.9.7. Design Thinking
- 10.10. Creativity Techniques
  - 10.10.1. Relational Thinking Techniques
  - 10.10.2. Techniques for Generating Ideas
  - 10.10.3. Techniques for Assessing Ideas
  - 10.10.4. Exercises of Ingenuity
  - 10.10.5. Artistic Disciplines for Creative Development
  - 10.10.6. RCS Method
  - 10.10.7. Other Techniques and Methods

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*A complete program that will take you through the knowledge you need to compete among the best"*

05

# Methodology

This program offers a different way of learning. Our methodology uses a cyclical learning approach: **Relearning**.

This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.







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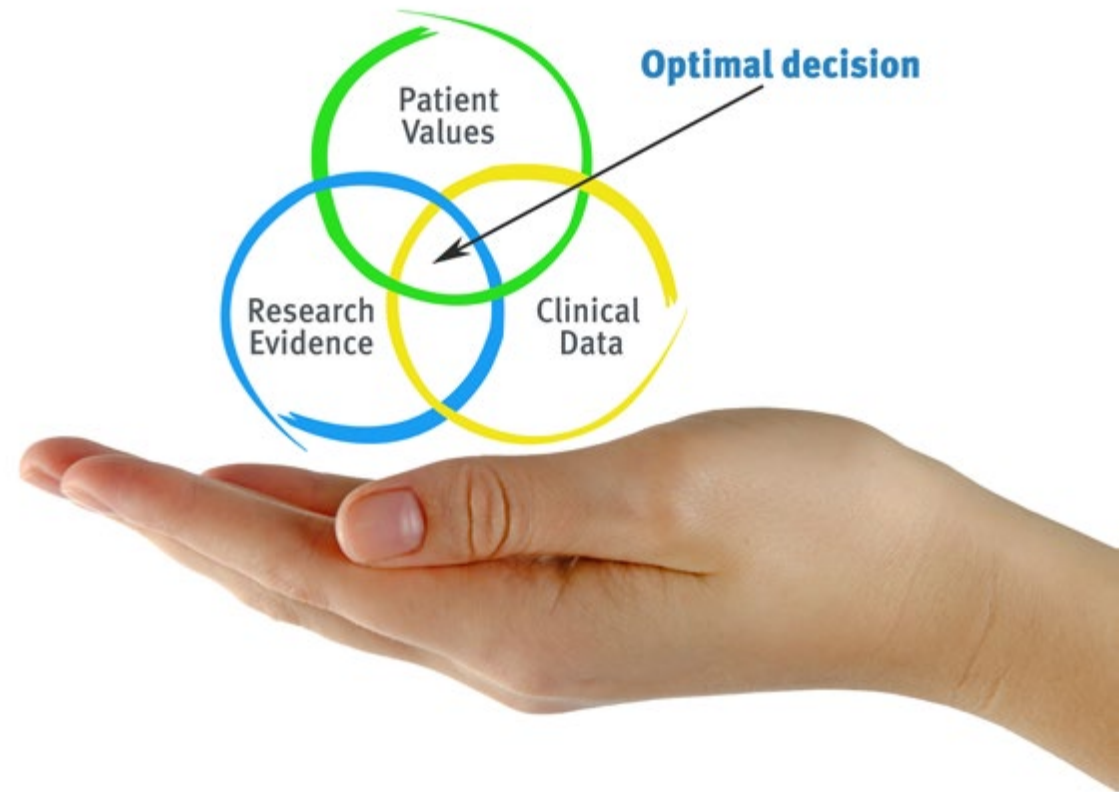
*Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"*



### At TECH Global University we use the Case Method

In a given situation, what should a professional do? Throughout the program students will be presented with multiple simulated cases based on real situations, where they have to investigate, establish hypotheses and, finally, resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method.

*With TECH, educators can experience a learning methodology that is shaking the foundations of traditional universities around the world*



*It is a technique that develops critical skills and prepares educators to make decisions, defend their arguments, and contrast opinions*

“

*Did you know that this method was developed in 1912, at Harvard, for law students? The case method consisted of presenting students with real-life, complex situations for them to make decisions and justify their decisions on how to solve them. In 1924, Harvard adopted it as a standard teaching method”*

The effectiveness of the method is justified by four fundamental achievements:

1. Educators who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their knowledge.
2. The learning process is solidly focused on practical skills that allow educators to better integrate the knowledge into daily practice.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life teaching.
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.



## Relearning Methodology

At TECH we enhance the case method with the best 100% online teaching methodology available: Relearning.

Our University is the first in the world to combine case studies with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, which represent a real revolution with respect to simply studying and analyzing cases.



*Educators will learn through real cases and by solving complex situations in simulated learning environments. These simulations are developed using state-of-the-art software to facilitate immersive learning*



At the forefront of world teaching, the Relearning method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best online university (Columbia University).

With this methodology we have trained more than 85,000 educators with unprecedented success in all specialties. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

*Relearning will allow you to learn with less effort  
and better performance, involving you more in  
your specialization, developing a critical mindset,  
defending arguments, and contrasting opinions:  
a direct equation to success*

In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and relearn). Therefore, we combine each of these elements concentrically.

The overall score obtained by our learning system is 8.01, according to the highest international standards.





This program offers the best educational material, prepared with professionals in mind:



### Study Material

All teaching material is produced by the specialist educators who teach the course, specifically for the course, so that the teaching content is really specific and precise.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.



### Educational Techniques and Procedures on Video

TECH introduces students to the latest techniques, with the latest educational advances, and to the forefront of Education. All this, first-hand, with the maximum rigor, explained and detailed for your assimilation and understanding. And best of all, you can watch them as many times as you want.



### Interactive Summaries

The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This exclusive multimedia content presentation system was awarded by Microsoft as a "European Success Story".



### Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.





**Expert-Led Case Studies and Case Analysis**

Effective learning ought to be contextual. Therefore, TECH presents real cases in which the expert will guide students, focusing on and solving the different situations: a clear and direct way to achieve the highest degree of understanding.



**Testing & Retesting**

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises: so that they can see how they are achieving their goals.



**Classes**

There is scientific evidence suggesting that observing third-party experts can be useful.

Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.



**Quick Action Guides**

TECH offers the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical, and effective way to help students progress in their learning.



06

# Certificate

The Professional Master's Degree in Educational Research guarantees you, in addition to the most rigorous and up-to-date training, access to a Professional Master's Degree issued by TECH Global University.



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*Successfully complete this program  
and receive your university degree  
without travel or laborious paperwork”*



This program will allow you to obtain your **Professional Master's Degree diploma in Educational Research** endorsed by **TECH Global University**, the world's largest online university.

**TECH Global University** is an official European University publicly recognized by the Government of Andorra (**official bulletin**). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

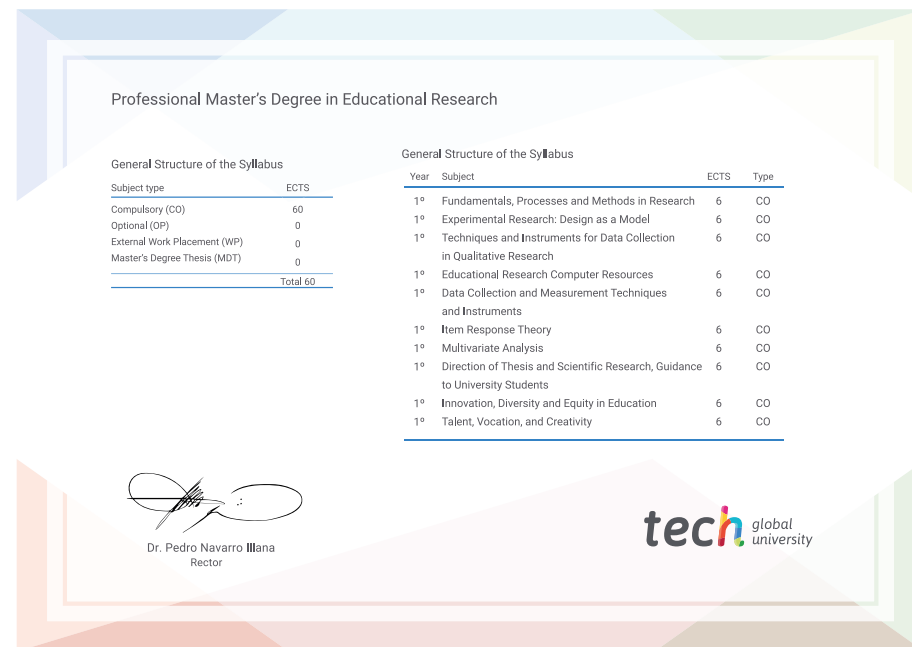
This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Professional Master's Degree in Educational Research**

Modality: **online**

Duration: **12 months**

Accreditation: **60 ECTS**



\*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH Global University will make the necessary arrangements to obtain it, at an additional cost.

future

health confidence people

education information tutors

guarantee accreditation teaching

institutions technology learning

community commitment

personalized service innovation

knowledge present quality

online training

development language

virtual classroom

**tech** global  
university

Professional Master's  
Degree

Educational Research

- » Modality: online
- » Duration: 12 months
- » Certificate: TECH Global University
- » Credits: 60 ECTS
- » Schedule: at your own pace
- » Exams: online

# Professional Master's Degree Educational Research

