Postgraduate Diploma

Mathematical Methodology and Learning in the Early Childhood Classroom

tech global university

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Postgraduate Diploma

Mathematical Methodology and Learning in the Early Childhood Classroom

- Modality: **online**
- Duration: **6 months**
- Certificate: **TECH Global University**
- Credits: **18 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: **www.techtitute.com/us/education/postgraduate-diploma/postgraduate-diploma-mathematical-methodology-learning-early-childhood-classroom**

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01

Introduction

Most knowledge acquisition revolves around observation and experimentation. With this in mind, Mathematics teaching has been revolutionized, incorporating more and more dynamic and interactive teaching methodologies and strategies, in which the child is a participant in the learning process through experiential practice, teamwork and problem solving. It is an innovative concept that has revolutionized Early Childhood Education, facilitating the acquisition and understanding of knowledge, as well as logical reasoning. It is precisely this aspect that is the focus of this 100% online program that TECH has developed so that teachers can update their skills based on the most innovative strategies. Thus, they will have the opportunity to redesign lesson plans to teach arithmetic, algebra, geometry, and measurement through play.

A program that will teach you how to strengthen logical thinking in the youngest children through the learning of Mathematics"

According to various international educational associations, the subject that students hate the most, as well as the one that represents the highest percentage of school failure, is mathematics. For many experts, this problem derives from a bad start in this subject in Early Childhood Education, with teaching based on obsolete methodologies that fail to lay the foundations for effective learning in the future. Therefore, the latest academic models have highlighted the importance of using innovative and dynamic teaching strategies in which the child can be actively involved, promoting, in addition to the acquisition of knowledge, a logical and practical thought process that can be applied to other academic areas and even to their daily life in the domestic or social environment.

In order for professionals in this field to keep up to date with these strategies, TECH and a teaching team specialized in this area have developed a 100% online program that includes the latest information on the subject. This is a 6-month program in which the teacher will be able to explore how to inculcate logical-mathematical thinking in Early Childhood Education through the promotion of related skills and with reference to most effective psycho-pedagogical concepts. They will also work intensively with the most effective and innovative methodologies for game-based learning and learn how to adapt the curriculum to apply gamification to arithmetic, algebra, geometry and measurement.

Students will have 450 hours of the best theoretical, practical and supplementary content, which will be hosted in a state-of-the-art Virtual Campus that they will be able to access from any device with an Internet connection. Thus, they will not have to worry about restricted schedules or face-to-face classes, but will enjoy an academic experience that adapts to their needs and demands. As a result, this is a unique opportunity to perfect their teaching skills through a Postgraduate Diploma that will undoubtedly mark a before and after in their professional career.

This **Postgraduate Diploma in Mathematical Methodology and Learning in the Early Childhood Classroom** contains the most complete and up-to-date educational program on the market. The most important features include:

- The examination of practical cases presented by experts in Mathematics teaching
- Graphic, schematic and practical contents which provide technical and practical information on those disciplines that are essential for professional practice
- Practical exercises where self-assessment can be undertaken to improve learning
- A special emphasis on innovative methodologies
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- Content that is accessible from any fixed or portable device with an Internet connection

You will work with the most cutting-edge learning methodologies, referring to a range of mathematical concepts and implementing the best practices"

Would you like to improve your teaching of arithmetic, algebra and other subjects? With this Postgraduate Diploma you will find out how to do so in a 100% online way"

The best program on the academic market to explore strategies for pre-numerical teaching through play.

You will work intensively on the redesign of the Mathematics curriculum for the different levels of Early Childhood Education using the most innovative teaching methodologies.

The program includes, in its teaching staff, professionals from the sector who bring their professional experience to this program, in addition to recognized specialists from prestigious reference societies and universities.

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide immersive learning designed for real situations.

This program is designed around Problem-Based Learning, whereby the professional must try to resolve the different professional practice situations that arise during the academic year. For this purpose, the student will be assisted by an innovative interactive video system created by renowned and experienced experts.

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Objectives

Educational trends in the last decade have revolutionized teaching through the introduction of increasingly effective and innovative techniques, thus motivating TECH to develop this Postgraduate Diploma. Therefore, the objective of this program is to provide teachers with the most comprehensive and exhaustive information related to Mathematics teaching in Early Childhood Education, focusing on the methodologies that have yielded the best results to date, as well as related pedagogical tools.

Thanks to this program, you will be able to incorporate the teaching materials and resources that are revolutionizing classrooms in countries with the best educational systems in the world"

General Objectives

- Learn mathematical concepts and vocabulary appropriate to design and deliver a teaching unit
- Identify the properties of objects and discover the relationships established between them through comparisons, classifications, serialization and sequencing
- Teach students to work with and learn the cardinal numbers in series, through the manipulation of the appropriate material, to know how they are composed of and broken down into lower numbers

TECH's goal is for you to achieve your own through an unparalleled academic experience providing all the material you need to do so"

Specific Objectives

Module 1. Mathematical Logical Thinking in Pre-school Education

- Understand the development of logical-mathematical thinking within the Pre-school and Elementary School Education curriculum
- Ensure that the children learn to deduce logically, to argue and to draw conclusions from the situations they are presented with
- Learn to work with different learning techniques

Module 2. Methodology and Classroom-Based Learning in Pre-school Education

- Know the basic concepts for the teaching of mental arithmetic in the classroom
- Develop materials and games to work on mental arithmetic in the classroom
- Learn about other resources available for the development of mental arithmetic in Pre-school and Elementary School Education classrooms
- Explore and implement cooperative work in the mathematics classroom

Module 3. Arithmetic, Algebra, Geometry and Measurement: Number Games

- Be able to plan different games and activities
- Encourage enthusiastic participation in different types of games, regulate behavior and harness excitement to achieve learning objectives
- Help students learn to count, to become familiar with numbers, to distinguish cardinal and ordinal numbers

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Course Management

The teaching team of this Postgraduate Diploma in Mathematical Methodology and Learning in the Early Childhood Classroom is composed of a group of high-level professionals from different areas related to children's cognitive development: teachers, pedagogues and psychologists. Thus, the graduate will be able to broaden his or her knowledge forming a thorough, critical and up-to-date view of teaching based on the didactic strategies that are currently trending and the perspectives of different specialists.

During the 6 months of the program, you will be able to resolve any doubts you may have, through consultations with the teaching team that you can request through the Virtual Campus"

International Guest Director

Doctor Noah Heller is a leading professional in the field of **Education**, specializing in the teaching of **Mathematics** and **Science**. With a focus on **teaching innovation,** he has dedicated his career to improving **educational practices in the K-12 system**. In addition, his main interests include the **professional development of teachers** and the creation of **teaching strategies** to improve the understanding of **Mathematics**, in **Primary** and **High School** students, through **innovative didactic approaches**.

Throughout his career, he has held positions of great relevance, for example, as **Faculty Chair** of the **Leadership Institute** at the Harvard **Graduate School of Education**. He has also directed the **"Master Math for America" Teacher Fellowship Program**, where he has overseen the instruction and expansion of a program that has impacted over 700 math and **science** teachers in **New York** City, working closely with senior **mathematics and science professionals.**

At the same time, he has collaborated as a researcher in several publications on the **teaching of mathematics** and **new didactics** applied to **primary education**. He has also given conferences and seminars in which he has promoted **pedagogical approaches** that encourage critical thinking in students, making mathematics teaching a dynamic and accessible process.

Internationally, Dr. Noah Heller has been recognized for his ability to implement innovative strategies in **STEM education.** In fact, his leadership in **"Master Math for America"** has positioned him as a key figure in teacher training, receiving accolades for his ability to connect academia with classroom practice. His work has also been instrumental in the creation of one of the most prestigious **professional development programs in education.**

Dr. Heller, Noah

- Faculty Chair at the Harvard Graduate School of Education, Cambridge, United Kingdom
- Director of the "Master Math for America" Teacher Fellowship Program
- Doctor of Philosophy from New York University
- B.S. in Science, Physics and Mathematics from The Evergreen State College

Thanks to TECH, you will be able to learn with the best professionals in the world"

Management

Ms. Delgado Pérez, María José

- Secondary and high school mathematics, technology, programming, robotics, biology, plastic arts, physics and chemistry teacher
- Master's Degree in Educational Center Management and Administration
- Leadership and management in Elementary, Middle School and High School
- Graduate in teaching with a specialization in English
- Industrial Engineer

Professors

Ms. Hitos, María

- Early Childhood and Elementary School Teacher, with experience in Mathematics
- Pre-school English Coordinator
- Language qualification in English by the Community of Madrid

Ms. Iglesias Serranilla, Elena

- Teacher of Pre-school and Elementary School Education, specialization in Music
- Elementary School Education First Cycle Coordinator
- Training in New Learning Methodologies

D. López Pajarón, Juan

- Secondary and High School Science Teacher
- Second Cycle Secondary School Coordinator and responsible for the center's projects
- Master's Degree in Educational Center Management and Administration
- Biologist with experience in the field of environmental conservation

Ms. Soriano de Antonio, Nuria

- Philologist Specialist in Spanish Language and Literature
- Master's Degree in High School Education and Vocational Training from the Alfonso X el Sabio University
- Master's Degree in Spanish for Foreigners
- Expert in Educational Center Management and Administration
- Expert in Didactics of Spanish
- Degree in Hispanic Philology from the Complutense University of Madrid

Ms. Vega, Isabel

- Elementary School Education teacher specialized in Special Education Mathematics teaching
- Elementary School Education Cycle Coordinator

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Structure and Content

Both the structure and the entire content of this Postgraduate Diploma have been designed by TECH following guidance from the teaching team, in line with the effective pedagogical methodology of *Relearning.* Thus, it has been possible to create a high-level program in which students will find 450 hours of the best content related to the teaching of Mathematics in Early Childhood Education. It is, therefore, a unique opportunity to incorporate the most comprehensive and up-to-date knowledge into your teaching through 100% online theoretical and practical professional development.

The content of this Postgraduate Diploma includes: detailed videos, research articles, further reading, self-awareness exercises and much more, so that you can expand each section in a way that suits you"

Module 1. Logical Mathematical Thinking in Pre-school Education

1.1. Logical-Mathematical Thinking
- 1.1.1. What is Mathematical Logic?
- 1.1.2. How is Mathematical Knowledge Acquired?
- 1.1.3. The Formation of Logical-Mathematical Concepts at an Early Age
- 1.1.4. Mathematical Concepts
- 1.1.5. Characteristics of Logical-Mathematical Thinking

1.2. Training of Skills Related to Logical-Mathematical Development.
- 1.2.1. Cognitive Development (Piaget)
- 1.2.2. Evolutionary Stages
- 1.2.3. Division of Thought in Knowledge (Piaget)
- 1.2.4. Evolution of Logical-Mathematical Knowledge
- 1.2.5. Physical Knowledge vs. Logical-Mathematical Knowledge
- 1.2.6. Knowledge of Space and Time

1.3. Development of Logical-Mathematical Thinking
- 1.3.1. Introduction
- 1.3.2. Knowledge and Reality
- 1.3.3. Development of Mathematical Knowledge
- 1.3.4. Development of Logical Thinking by Age
- 1.3.5. Components of Logical Development
- 1.3.6. Mathematical Language
- 1.3.7. Logical-Mathematical Development and Core Curriculum

1.4. Psychopedagogical Foundations in the Construction of Mathematical Knowledge
- 1.4.1. Sensorimotor Intelligence
- 1.4.2. Formation of Objective Symbolic Thinking
- 1.4.3. Formation of Concrete-Logical Thinking
- 1.4.4. Reasoning and its Types
- 1.4.5. Bloom's Taxonomy in the Development of Logical-Mathematical Thinking

1.5. Logical-Mathematical Learning (I)
- 1.5.1. Introduction
- 1.5.2. Structuring of the Body Scheme
  - 1.5.2.1. Body Concept
  - 1.5.2.2. Body Image
  - 1.5.2.3. Postural Adjustment
  - 1.5.2.4. Coordination

1.6. Notions of Order
- 1.6.1. Comparison
- 1.6.2. Correspondence
- 1.6.3. Quantifiers
- 1.6.4. Quantity Conservation
- 1.6.5. Sets or Groupings
- 1.6.6. Formation of Sets
- 1.6.7. Numerical Cardinality
- 1.6.8. The Number Concept
- 1.6.9. Comparison of Sets
- 1.6.10. Set Equivalence
- 1.6.11. Recognition of Natural Numbers
- 1.6.12. Ordinal Numbers
- 1.6.13. Mathematical Operations: Addition and Subtraction

1.7. Pre-Numerical Knowledge: Classification
- 1.7.1. What is Classification?
- 1.7.2. Processes
- 1.7.3. Types of Classification
- 1.7.4. Cross Classifications
- 1.7.5. Classification Games

1.8. Seriation Games
- 1.8.1. Importance of Making Series
- 1.8.2. Logical Operations in the Construction of Series
- 1.8.3. Types of Series
- 1.8.4. Seriation in Pre-school Education
- 1.8.5. Seriation Games

1.9. Pre-Numerical Knowledge: Enumeration
- 1.9.1. Conceptualization and Function of Enumeration
- 1.9.2. Logical Operations Involved in Enumeration
- 1.9.3. Enumeration in Pre-school Education Design of Activities
- 1.9.4. Design of Activities
- 1.9.5. Task-Based Achievements

1.10. Representation and Manipulative Mathematics
- 1.10.1. Development of Logical-Mathematical Thinking Through the Senses
- 1.10.2. Representation, Visualization and Reasoning
- 1.10.3. Design of Activities Supported by Representation
- 1.10.4. Manipulative Mathematics: Functions and Resources
- 1.10.5. Design of Activities that Rely on Manipulation

Module 2. Methodology and Classroom-Based Learning in Pre-school Education

2.1. Holistic Teaching in Pre-school Education
- 2.1.1. Cooperative Learning
- 2.1.2. Project Method
- 2.1.3. Play
- 2.1.4. Mathematics Corner
- 2.1.5. Daily Activities (Routines)
- 2.1.6. Workshops
- 2.1.7. Large Regulated Group Activities

2.2. Construction of Mathematical Knowledge in T
- 2.2.1. Introduction
- 2.2.2. Models for the Teaching-Learning of Mathematics
- 2.2.3. Specificity and Significance of Mathematical Knowledge
- 2.2.4. Learning and Management of Didactic Variables
- 2.2.5. Errors and Obstacles in Mathematical Learning

2.3. Mathematics Curriculum in Pre-school Education
- 2.3.1. Introduction
- 2.3.2. Didactic Transposition
- 2.3.3. General Considerations for the Mathematics Curriculum in Pre-school Education
- 2.3.4. NCTM Considerations
- 2.3.5. Curriculum and Inferential Relationships in Pre-school Education
- 2.3.6. Inferential Elements in Pre-school Education
- 2.3.7. School Mathematics Curriculum and Relationship Building
- 2.3.8. Argument and Mathematical Discourse in Pre-school Education

2.4. Creativity in Mathematics Intelligence Bits Method
- 2.4.1. Introduction
- 2.4.2. Main Creativity Theories
- 2.4.3. Principles of School Mathematics
- 2.4.4. Mathematics Standards
- 2.4.5. Intelligence Bits Method

2.5. Methodological Proposals for Students with Educational Needs
- 2.5.1. Introduction
- 2.5.2. Create a Learning Environment to Include Children's Diversity
- 2.5.3. Diversity of the Classroom in Today's Society
- 2.5.4. Inclusive Classroom Climate as an Educational Response to Diversity
- 2.5.5. Methodological Change
- 2.5.6. Mathematical Knowledge is Built From One's Own Experience
- 2.5.7. Teaching Methods of Mathematics
- 2.5.8. Fundamental Principles
- 2.5.9. Description of the Method

2.6. Principles of Didactic Methodology for the Teaching-Learning of Mathematics in Pre-school Education
- 2.6.1. Methodology
- 2.6.2. Basic Methodological Lines
- 2.6.3. Child Stimulation
- 2.6.4. Sequence of Learning
- 2.6.5. Characteristics of Learning Assessment
- 2.6.6. Assessment Tools

2.7. Theory of Teaching Situations
- 2.7.1. Introduction
- 2.7.2. Teaching Contract
- 2.7.3. TDS-Based Learning
- 2.7.4. Analysis of Real Situations
- 2.7.5. Variables and their Management

2.8. Teaching Resources and Activities
- 2.8.1. Main Principles of Mathematical Learning
- 2.8.2. Strategies that Create a Positive Predisposition Toward Mathematics
- 2.8.3. Logical-Mathematical Materials and Resources Utilities
- 2.8.4. Non-Material Resources
- 2.8.5. Mathematical Activities Suitable for Pre-school
- 2.8.6. Constructive Logical-Mathematical Activities

2.9. Analysis of Objectives, Contents and Evaluation Criteria
- 2.9.1. Analysis of Objectives (First Cycle)
- 2.9.2. Analysis of Objectives (Second Cycle)
- 2.9.3. Content Analysis
- 2.9.4. Evaluation Criteria (First Cycle)
- 2.9.5. Evaluation Criteria (Second Cycle)

2.10. Evaluation in Pre-school Education
- 2.10.1. Introduction
- 2.10.2. Characteristics of Pre-school Evaluation
- 2.10.3. Evaluation of Teaching in Pre-school Education
- 2.10.4. Evaluation of Learning in Pre-school Education
- 2.10.5. Regulatory Framework
- 2.10.6. Headings

Module 3. Arithmetic, Algebra, Geometry and Measurement Games with Numbers

3.1. Initiation to Number
- 3.1.1. Number Concept
- 3.1.2. Construction of the Number Structure
- 3.1.3. Numerical Development: Counting
  - 3.1.3.1. Phases in Learning the Numerical Sequence
    - 3.1.3.1.1. Rope or String Level
    - 3.1.3.1.2. Unbreakable Chain Level
    - 3.1.3.1.3. Breakable Chain Level
    - 3.1.3.1.4. Numerable Chain Level
    - 3.1.3.1.5. Bidirectional Chain Level
- 3.1.4. Counting Principles
  - 3.1.4.1. One-to-one Correspondence Principle
  - 3.1.4.2. Stable Order Principle
  - 3.1.4.3. Cardinality Principle
  - 3.1.4.4. Abstraction Principle
  - 3.1.4.5. Irrelevance of Order Principle
- 3.1.5. Procedures used by the Child in Counting
  - 3.1.5.1. Term to Term Correspondence
  - 3.1.5.2. Subset to Subset Correspondence
  - 3.1.5.3. Purely Visual Estimation
  - 3.1.5.4. Subitization
  - 3.1.5.5. Count the Elements of a Collection
  - 3.1.5.6. Recount
  - 3.1.5.7. Discount
  - 3.1.5.8. Overcount
  - 3.1.5.9. Calculation Procedures
- 3.1.6. Fundamental Cardinal and Ordinal Situations
- 3.1.7. The Importance of Zero
- 3.1.8. Strategies to Enhance the Concept and Use of Number

3.2. Number Acquisition Process
- 3.2.1. Introduction
- 3.2.2. Number Concept
  - 3.2.2.1. Perception of General Quantities
  - 3.2.2.2. Distinguishing and Comparing Quantities of Objects
  - 3.2.2.3. Uniqueness Principle
  - 3.2.2.4. Generalization
  - 3.2.2.5. Summative Action
  - 3.2.2.6. Capture of Named Quantities
    - 3.2.2.6.1. Oral Numeric Series
    - 3.2.2.6.2. Counting Objects
    - 3.2.2.6.3. Cardinal Representation
    - 3.2.2.6.4. Compare Magnitudes
  - 3.2.2.7. Identification of the Name with its Representation
  - 3.2.2.8. Invariance of Named Quantities

3.2.3. From Experimental Psychology
3.2.3.1. Distance Effect
3.2.3.2. Size Effect
3.2.3.3. Numerical Spatial Arrangement
3.2.4. From Developmental Psychology
3.2.4.1. Behavioral, Cognitive and Constructivist Theory
3.2.4.1.1. Exercise Law
3.2.4.1.2. Law of Effect
3.2.5. Theories on the Process of Number Acquisition
3.2.6. Piaget
3.2.6.1. Stages
3.2.6.2. Requirements for the Understanding of the Notion of Number
3.2.7. Dienes
3.2.7.1. Principles
3.2.7.1.1. Dynamic Principle
3.2.7.1.2. Constructive Principle
3.2.7.1.3. Economic Variability Principle
3.2.7.1.4. Constructive Variability Principle
3.2.7.2. Stages
3.2.7.2.1. Free Play
3.2.7.2.2. Game with Rules
3.2.7.2.3. Isomorphic Games
3.2.7.2.4. Representation
3.2.7.2.5. Description
3.2.7.2.6. Deduction
3.2.8. Mialaret
3.2.8.1. Stages
3.2.8.1.1. Action Itself
3.2.8.1.2. Action Accompanied by Language
3.2.8.1.3. Conduct of the Narrative
3.2.8.1.4. Application of the Story to real Situations
3.2.8.1.5. Graphical Expression of the Actions already Reported and Represented
3.2.8.1.6. Symbolic Translation of the Studied Problem
3.2.9. Information Processing
3.2.9.1. Numerical Apprehension Model
3.2.9.2. Pre-linguistic Numerical Skills
3.2.10. Counting Principles (Gelman and Gallistel)
3.2.10.1. Biunivocal Correspondence Principle
3.2.10.2. Stable Order Principle
3.2.10.3. Cardinality Principle
3.2.10.4. Abstraction Principle
3.2.10.5. Inconsequence of Order Principle
3.2.11. Comparison of Counting Concepts in Piaget's, Gelman's and Gallistel's Theory
3.3. Informal Arithmetic I
3.3.1. Introduction
3.3.2. Towards an Informal and Intuitive Arithmetic in Pre-school Education
3.3.2.1. Recognize Quantities
3.3.2.2. Relate Quantities
3.3.2.3. Operate Quantities
3.3.3. Objectives
3.3.4. Early Arithmetic Skills
3.3.4.1. Preservation of Inequality
3.3.5. Arithmetic Skills and Chants
3.3.5.1. Preliminary Considerations
3.3.5.1.1. The Social-Cognitive Conflict
3.3.5.1.2. Role of the Language
3.3.5.1.3. Creation of Contexts
3.3.5.2. Procedures and Mastery of the Chants
3.4. Informal Arithmetic II
3.4.1. Memorization of Numerical Facts
3.4.1.1. Activities to Work on Memorization
3.4.1.2. Domino
3.4.1.3. Hopscotch
3.4.2. Didactic Situations for the Introduction of Addition
3.4.2.1. Dialed Number Game
3.4.2.2. Race to 10
3.4.2.3. Christmas Greeting

3.5. Basic Arithmetic Operations
- 3.5.1. Introduction
- 3.5.2. Additive Structure
  - 3.5.2.1. Phases of Mialaret
    - 3.5.2.1.1. Approach Through Manipulation
    - 3.5.2.1.2. Action Accompanied by Language
    - 3.5.2.1.3. Mental Work Supported by Verbalization
    - 3.5.2.1.4. Purely Mental Work
  - 3.5.2.2. Strategies to Add
  - 3.5.2.3. Initiation to Subtraction
  - 3.5.2.4. Addition and Subtraction
    - 3.5.2.4.1. Direct and Object Modeling
    - 3.5.2.4.2. Counting Sequences
    - 3.5.2.4.3. Recalled Numeric Data
    - 3.5.2.4.4. Strategies to Add
    - 3.5.2.4.5. Subtraction Strategies
- 3.5.3. Multiplication and Division
- 3.5.4. Arithmetic Problem Solving
  - 3.5.4.1. Addition and Subtraction
  - 3.5.4.2. Multiplications and Divisions

3.6. Space and Geometry in Pre-school Education
- 3.6.1. Introduction
- 3.6.2. Objectives Proposed by the NCTM
- 3.6.3. Psychopedagogical Considerations
- 3.6.4. Recommendations for Teaching Geometry
- 3.6.5. Piaget and his Contribution to Geometry
- 3.6.6. Van Hiele Model
  - 3.6.6.1. Levels
    - 3.6.6.1.1. Visualization or Recognition
    - 3.6.6.1.2. Analysis
    - 3.6.6.1.3. Sorting and Classification
    - 3.6.6.1.4. Rigor
  - 3.6.6.2. Learning Phases
    - 3.6.6.2.1. Phase 1: Consultancy
    - 3.6.6.2.2. Phase 2: Directed Guidance
    - 3.6.6.2.3. Phase 3: Explication
    - 3.6.6.2.4. Phase 4: Guidance
    - 3.6.6.2.5. Phase 5: Integration
- 3.6.7. Geometry Types
  - 3.6.7.1. Topological
  - 3.6.7.2. Projective
  - 3.6.7.3. Metrics
- 3.6.8. Visualization and Reasoning
  - 3.6.8.1. Spatial Orientation
  - 3.6.8.2. Spatial Structuring
  - 3.6.8.3. Gálvez and Brousseau
    - 3.6.8.3.1. Microspace
    - 3.6.8.3.2. Mesospace
    - 3.6.8.3.3. Macrospace

3.7. Magnitudes and their Measurement
- 3.7.1. Introduction
- 3.7.2. Construction of the Notion of Magnitude in the Child
  - 3.7.2.1. Piagetian Phases in the Construction of Magnitudes
    - 3.7.2.1.1. Consideration and Perception of a Magnitude
    - 3.7.2.1.2. Conservation of Magnitude
    - 3.7.2.1.3. Ordering with Respect to Magnitude
    - 3.7.2.1.4. Correspondence of Numbers to Quantities of Magnitude
  - 3.7.2.2. Stages in the Construction of the Measure
    - 3.7.2.2.1. Direct Perceptual Comparison
    - 3.7.2.2.2. Displacement of Objects
    - 3.7.2.2.3. Operability of the Transitive Property
  - 3.7.2.3. Stages in the Teaching-Learning of Magnitudes
    - 3.7.2.3.1. Sensory Stimulation
    - 3.7.2.3.2. Direct Comparison
    - 3.7.2.3.3. Indirect Comparison
    - 3.7.2.3.4. Choice of Unit
    - 3.7.2.3.5. Irregular Measurement System
    - 3.7.2.3.6. Regular Measurement System

3.7.3. Measuring Magnitudes
3.7.4. Length Measurement
3.7.5. Length Measurement
3.7.6. Measurement of Capacity and Volume
3.7.7. Measurement of Time
3.7.8. Phases of the Different Magnitudes
3.7.8.1. Preparation Phase
3.7.8.2. Measurement Practice Phase
3.7.8.3. Consolidation Phase of Techniques and Concepts
3.8. Play in Pre-school Education
3.8.1. Introduction
3.8.2. Objectives
3.8.3. Game Features
3.8.4. Evolution of the Game
3.8.4.1. Types of Games
3.8.4.1.1. Functional Game
3.8.4.1.2. Imitation or Symbolic Play
3.8.4.1.3. Game with Rules
3.8.4.1.4. Construction Game
3.8.5. Chance and Strategy
3.8.6. Competition in the Games
3.8.7. Didactic Considerations on the Game
3.9. Didactic Resources of the Game
3.9.1. Games and Logical Thinking
3.9.1.1. Three in a Row
3.9.1.2. Quarto
3.9.1.3. Portrait Games
3.9.2. Quantitative Games
3.9.2.1. Number to Compare
3.9.2.1.1. Let's Go Home!!
3.9.2.2. Number to Calculate
3.9.2.2.1. Couples
3.9.2.2.2. It's Over!!
3.9.2.2.3. Cat and Mouse
3.9.3. Games and the Structure of Space
3.9.3.1. Puzzles
3.9.3.1.1. Two-Color Paintings
3.9.3.1.2. The Hex
3.10. Games in Different Spaces
3.10.1. Introduction
3.10.2. Games in the Classroom
3.10.2.1. The Butterfly Game
3.10.2.2. The Partitioning Game
3.10.2.3. Image Trains
3.10.2.4. The Newspaper
3.10.2.5. Flat Figures
3.10.2.6. Containers
3.10.3. Games in Psychomotor Skills
3.10.3.1. Working with Sizes
3.10.3.2. Classify
3.10.3.3. We Play with the Hoops
3.10.4. Outdoor Games
3.10.5. Mathematical Games with ICT
3.10.5.1. Playing with the Turtle's Mind
3.10.5.2. Geometric Figures
3.10.5.3. For 3-Year-Old Students
3.10.5.4. Variety of Activities
3.10.5.5. Didactic Unit

05

Methodology

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

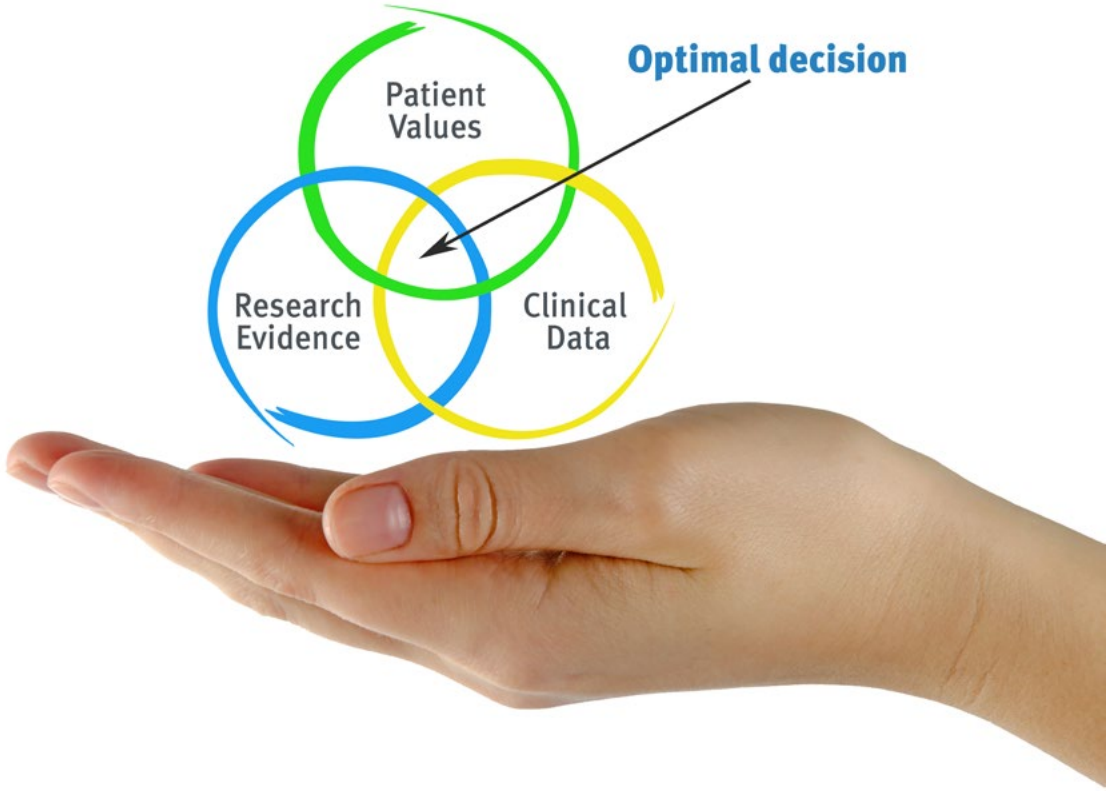
This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

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 Education School 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 will 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:

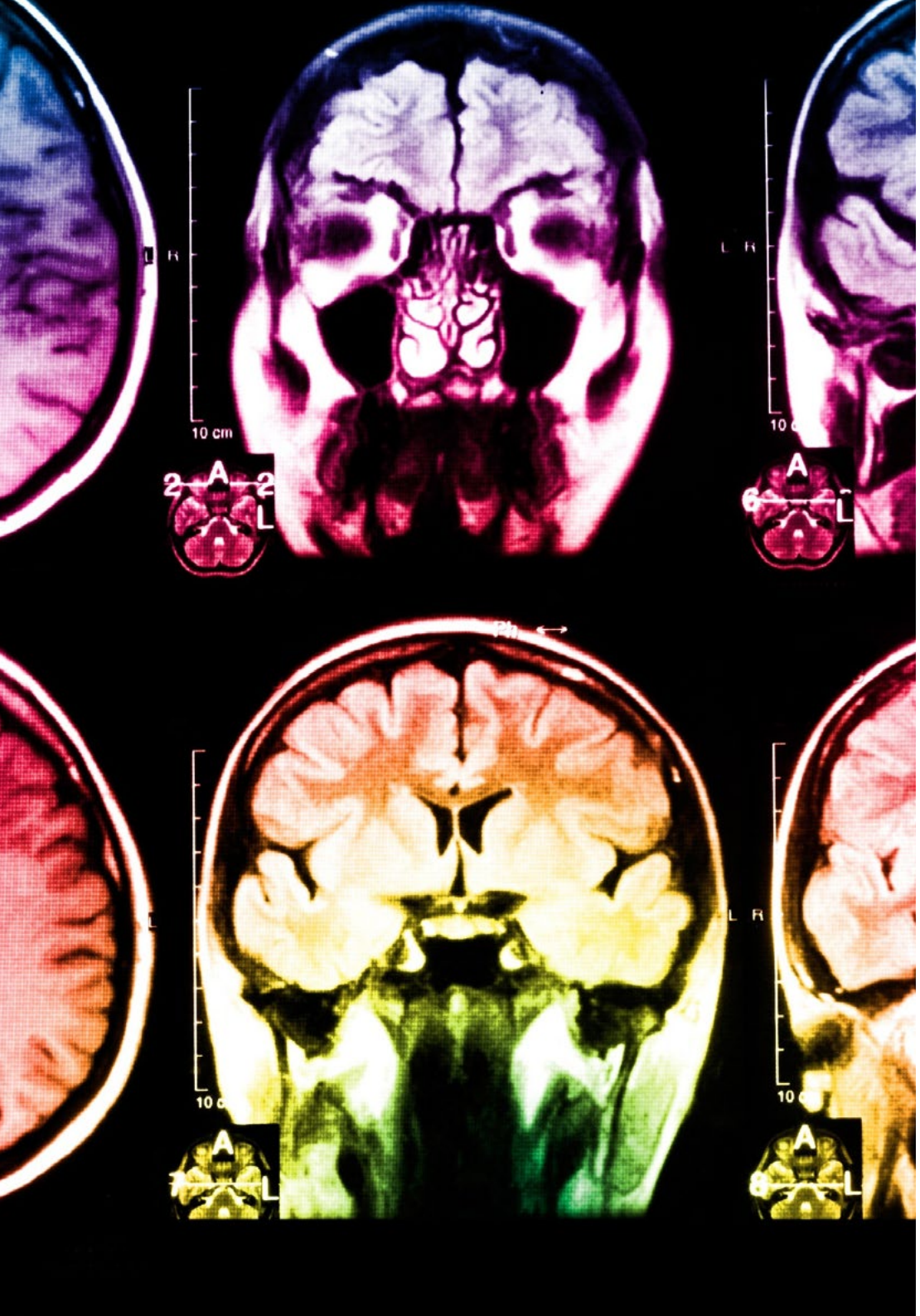
1. Educators who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their knowledge.
2. The learning process is solidly focused on practical skills that allow educators to better integrate the knowledge into daily practice.
3. 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 re-learn). 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.

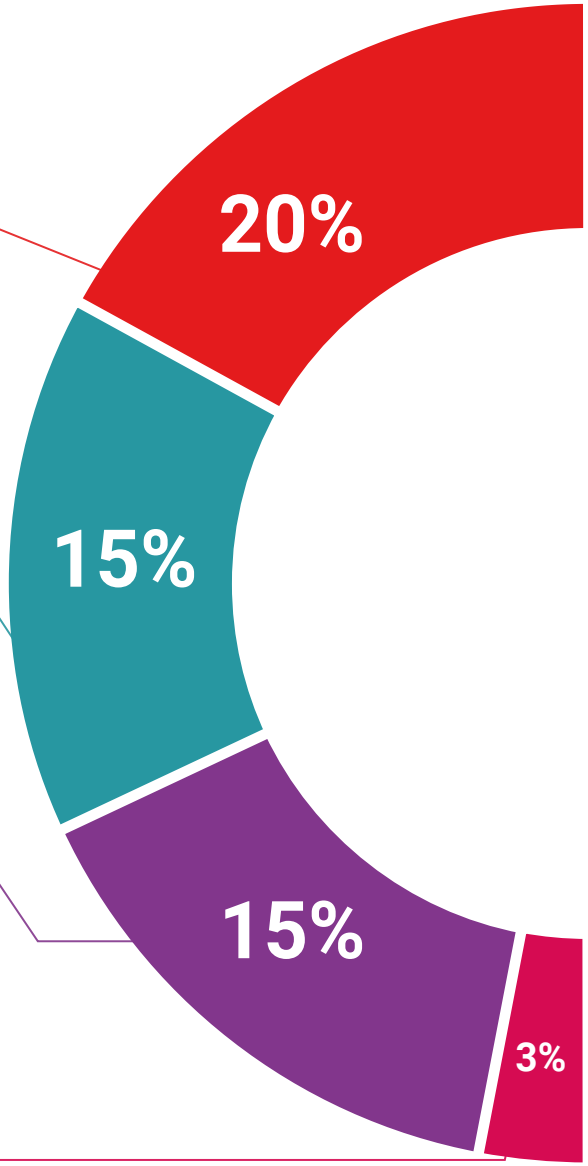
Interactive Summaries

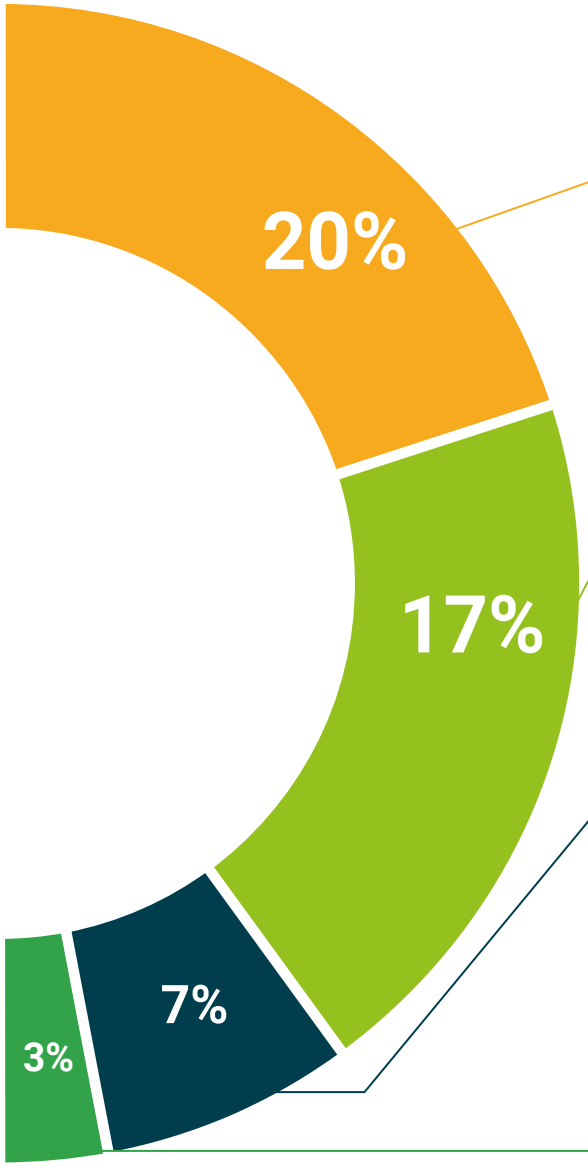
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This exclusive multimedia content presentation training Exclusive 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 your 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 Postgraduate Diploma in Mathematical Methodology and Learning in the Early Childhood Classroom guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma issued by TECH Global University.

Successfully complete this program and receive your Postgraduate Diploma without having to travel or fill out laborious paperwork"

This program will allow you to obtain your **Postgraduate Diploma in Mathematical Methodology and Learning in the Early Childhood Classroom** 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.

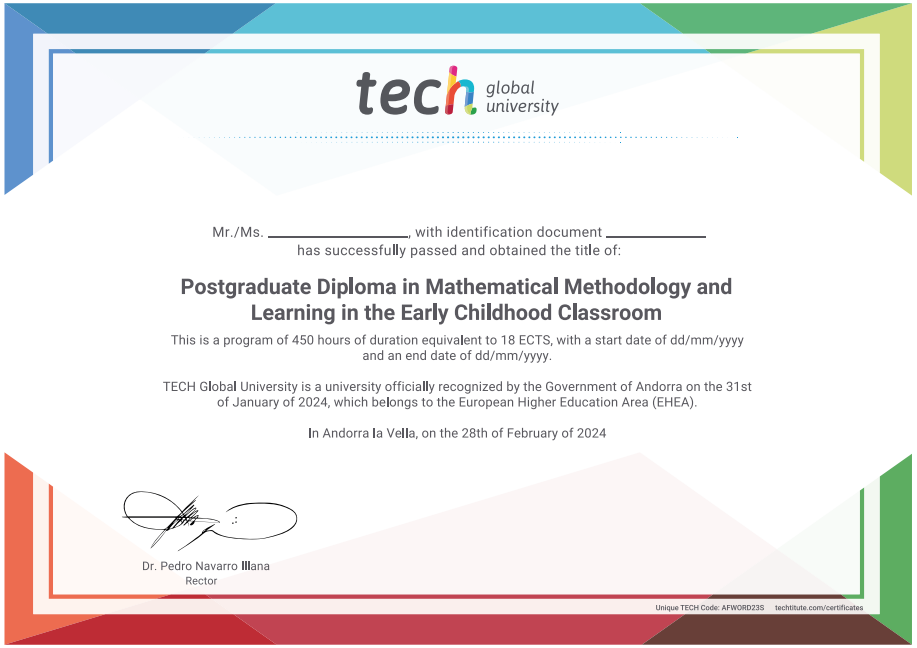
This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Diploma in Mathematical Methodology and Learning in the Early Childhood Classroom**

Modality: **online**

Duration: **6 months**

Credits: **18 ECTS**


tech global university

Mr./Ms. _____, with identification document _____
has successfully passed and obtained the title of:

Postgraduate Diploma in Mathematical Methodology and Learning in the Early Childhood Classroom

This is a program of 450 hours of duration equivalent to 18 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana
Rector

Unique TECH Code: AFWORD23S techtitute.com/certificates

*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.

tech global university

Postgraduate Diploma

Mathematical Methodology and Learning in the Early Childhood Classroom

- Modality: **online**
- Duration: **6 months**
- Certificate: **TECH Global University**
- Credits: **18 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Postgraduate Diploma

Mathematical Methodology and Learning in the Early Childhood Classroom

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