Postgraduate Certificate

Problem Solving and Mental Calculation in Pre-School Education

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Postgraduate Certificate

Problem Solving and Mental Calculation in Pre-School Education

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

Website: **www.techtitute.com/us/education/postgraduate-certificate/problem-solving-mental-calculation-pre-school**

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01

Introduction

This program trains the student in the teaching of logical-mathematical concepts in Pre-school Education through Problem Solving and in the logical bases of Mental Calculation.

This Postgraduate Certificate in Problem Solving and Mental Calculation in Pre-School Education will generate a sense of confidence in the performance of your profession, which will help you grow personally and professionally"

This Postgraduate Certificate focuses on the idea of the Problem from the correct reading of the statement and the correct understanding of it, taking into account the cognitive level of the student of Pre-school.

This Postgraduate Certificate introduces the logical bases of Mental Calculation in Pre-school Education and offers a series of resources such as the Game for calculation in this phase. It also introduces Number Based Learning (NBL) through an educational proposal.

This Postgraduate Certificate will allow students to acquire the basic skills for the understanding of the teaching-learning process around the logical-mathematical concepts in Pre-school Education, Problem Solving and Mental Calculation. In addition, it trains the student in Number Based Learning (NBL).

This **Postgraduate Certificate in Problem Solving and Mental Calculation in Pre-School Education** contains the most complete and up-to-date educational program on the market. The most important features include:

- Development of more than 75 case studies presented by experts in Problem Solving and Mental Calculation in Pre-School Education
- The graphic, schematic, and practical contents with which they are created provide scientific and practical information on the disciplines that are essential for professional practice
- Latest developments on Problem Solving and Mental Calculation in Pre-School Education
- It contains practical exercises where the self-assessment process can be carried out to improve learning
- Special emphasis on innovative methodologies in Problem Solving and Mental Calculation in Pre-School Education
- Content that is accessible from any fixed or portable device with an Internet connection

Update your knowledge through this Postgraduate Certificate in Problem Solving and Mental Calculation in Pre-School Education"

This Postgraduate Certificate is the best investment you can make in the selection of an updating program for two reasons: in addition to updating your knowledge in Problem Solving and Mental Calculation in Pre-School Education, you will obtain a Postgraduate Certificate from TECH Global University"

Increase your decision-making confidence by updating your knowledge through this Postgraduate Certificate.

Take the opportunity to learn about the latest advances in Problem Solving and Mental Calculation in Pre-School Education and improve the attention to your students.

It includes, in its teaching staff professionals belonging to the field of Problem Solving and Mental Calculation in Pre-School Education, which brings to this training their work experience, as well as recognized specialists belonging to reference societies and prestigious universities.

Thanks to its multimedia content developed with the latest educational technology, they will allow the professional a situated and contextual learning, that is to say, a simulated environment that will provide an immersive learning programmed to prepare in real situations.

The design of this program is based on Problem-Based Learning, by means of which the student must try to solve the different professional practice situations that arise throughout the Academic program. To do so, they will be assisted by an innovative interactive video system created by recognized experts in the field of Problem Solving and Mental Calculation in Pre-School Education and with great teaching experience.

02

Objectives

The Postgraduate Diploma in Problem Solving and Mental Calculation in Pre-School Education is oriented to help students be able to consider the most common errors and obstacles when teaching mathematics.

This Postgraduate Certificate is designed to update your knowledge in Problem Solving and Mental Calculation in Pre-School Education, with the use of the latest educational technology, to contribute with quality and security to the decision making and monitoring of these students"

General Objective

- Provide students with advanced education, of a specialized nature and based on theoretical and instrumental knowledge that will allow them to acquire and develop the competencies and skills required to obtain a qualification as a professional in Teaching Mathematics in Pre-School and Primary School

Take advantage of the opportunity and take the step to catch up on the latest developments in Problem Solving and Mental Calculation in Pre-School Education"

Specific Objectives

- Get the child to read and understand the problem statements
- Learning to compare and understand the equivalence between different objects
- Use simple calculation tools
- Solve simple operations involving adding, subtracting, expressing difference and dividing
- Properly use counting and quantification strategies and represent quantities or results graphically by means of icons or figures
- Appreciate the usefulness of performing mediations to solve small everyday problems and become familiar with units of measurement of space and time

03

Course Management

The program includes in its teaching staff leading experts in Problem Solving and Mental Calculation in Pre-School Education which pours into this program the experience of their work. In addition, other experts of renowned prestige participate in its design and planning completing the program in an interdisciplinary manner.

Learn from professionals of reference, the latest advances in the procedures in Problem Solving and Mental Calculation in Pre-School School Education"

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

- Industrial Engineer Graduate in teaching with a specialization in English
- Secondary and high school teacher of mathematics, technology, programming, robotics, biology, plastic arts, physics and chemistry
- Master's Degree in Educational Center Management and Administration
- Professional with extensive experience in the direction and management of Elementary, Secondary and High School Education, managing a group of more than 25 teachers
- Excellent communicator, results oriented, empathetic and very close to everyone

Professors

Ms. Hitos, María

- Pre-school and Primary Education Teacher
- Pre-school English Coordinator
- Language qualification in English by the Community of Madrid
- Extensive experience in the teaching of mathematics at both stages of education

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

Mr. López Pajarón, Juan

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

Ms. Vega, Isabel

- Primary School Education teacher specialized in Special Education
- Primary School Education Cycle Coordinator
- Extensive experience in teaching mathematics and learning disabilities

04

Structure and Content

The structure of the contents has been designed by a team of professionals from the best educational institutions and universities in the country, who are aware of the relevance of up-to-date, innovative education and are committed to quality teaching using new educational technologies.

This Postgraduate Certificate in Problem Solving and Mental Calculation in Pre-School Education, contains the Scientific most complete and up-to-date educational program on the market"

Module 1. Problem Solving and Mental Calculation

1.1. Problem in Pre-school Education
- 1.1.1. Methodological Considerations
- 1.1.2. Psychopedagogical Considerations of the Initiation of Problem Idea Representation
- 1.1.3. What is a Problem?
- 1.1.4. Psychopedagogical Considerations of the Initiation of Problem Idea Representation
- 1.1.5. How to Pose Problems in Preeschool?

1.2. Idea of a Problem to be Introduced in Pre-school Education
- 1.2.1. Why do We Solve Problems?
- 1.2.2. Perspectives for the Inclusion of Comprehension and Problem Solving in Pre-school Education
- 1.2.3. Specific Didactic Contract for Problem Solving in Pre-school Education
- 1.2.4. Most Appropriate Models for Introducing the idea of Problem in Pre-school Education
- 1.2.5. Reading and Understanding Statements
  - 1.2.5.1. Factors of Understanding Statements
- 1.2.6. Didactic Variables of the Statements

1.3. Towards a Didactic Approach to the Introduction to the idea of Problem in Pre-school Education
- 1.3.1. Factors to be Taken into Consideration in the Approach and Resolution of Problems in Pre-school
- 1.3.2. Learning Logical-Mathematical Concepts Through Problem Solving
  - 1.3.2.1. Heuristic Strategies
  - 1.3.2.2. Technique Most Commonly Used at These Ages for Problem Solving
  - 1.3.2.3. Numerical Strategies
- 1.3.3. Various Situations for the Teaching of Proposition and Problem Solving
- 1.3.4. Problem Solving Constituent Elements of a Problem
  - 1.3.4.1. Problems that Serve as Exercises to Practise the Problem Idea
- 1.3.5. Main Recommendations for Approaching the Problem Idea in Pre-school Education

1.4. Mathematical Value of Stories
- 1.4.1. Pre-school Learning and Mathematics
- 1.4.2. Stories and Mathematics
- 1.4.3. Examples of Stories and Mathematical Learning
  - 1.4.3.1. Logical Development
  - 1.4.3.2. Numerical Development
  - 1.4.3.3. Development of Magnitudes and their Measurement
  - 1.4.3.4. Development of Geometric Thinking
  - 1.4.3.5. Problem Solving

1.5. Logical Basis of Mental Calculation in Pre-school Education
- 1.5.1. Logical Operations
  - 1.5.1.1. Classifications
  - 1.5.1.2. Relationships of Order
- 1.5.2. Mental Calculation, Written Calculation and Estimated Calculation
- 1.5.3. Counting Process
- 1.5.4. Phases for Learning the Counting Activity

1.6. Informal Arithmetic
- 1.6.1. Calculation Strategy
- 1.6.2. Comparison and Equivalence
- 1.6.3. Composition and Decomposition
- 1.6.4. Initiation to Operational Activity: Adding, Subtracting, Folding and Distributing

1.7. Mental Calculation in Pre-school Education
- 1.7.1. Calculation Examples for Pre-school Education
- 1.7.2. Perform Calculation by Manipulating Material
- 1.7.3. Calculation Without Material Handling
- 1.7.4. Proposal for Mental Calculation in Pre-school Education
  - 1.7.4.1. Guessing Game
  - 1.7.4.2. It is Learned by Heart
- 1.7.5. Mechanics Acquired at the End of Pre-school Education
- 1.7.6. Resources to Achieve Apprenticeships
- 1.7.7. Practical Issues

1.8. Resource Bank for Calculation in Pre-school Education
- 1.8.1. Abacus
  - 1.8.1.1. Description
  - 1.8.1.2. Possibilities for Didactic Use
  - 1.8.1.3. Classroom Didactic Situations
- 1.8.2. Multibase Blocks
  - 1.8.2.1. Description
  - 1.8.2.2. Possibilities for Didactic Use
  - 1.8.2.3. Classroom Didactic Situations
- 1.8.3. Cuisenaire Strips
  - 1.8.3.1. Description
  - 1.8.3.2. Possibilities for Didactic Use
  - 1.8.3.3. Classroom Didactic Situations
- 1.8.4. Domino
  - 1.8.4.1. Description
  - 1.8.4.2. Possibilities for Didactic Use
  - 1.8.4.3. Classroom Didactic Situations
- 1.8.5. Battle Game
  - 1.8.5.1. Description
  - 1.8.5.2. Possibilities for Didactic Use
  - 1.8.5.3. Classroom Didactic Situations

1.9. Open Calculation Method based on ABN Numbers
- 1.9.1. What is the ABN Algorithm Method?
  - 1.9.1.1. Quantity and Cardinality of Sets
  - 1.9.1.2. Number Structure and Set Comparison
    - 1.9.1.2.1. Figurative Representation
    - 1.9.1.2.2. Symbolic Representation
    - 1.9.1.2.3. Symbol-Sign Representation
    - 1.9.1.2.4. Representation by Signs
  - 1.9.1.3. Counting Well Over Ten
  - 1.9.1.4. Number Transformations First Operations
- 1.9.2. Background of the ABN Method
- 1.9.3. Intuitive Approach vs. Traditional Approach

1.10. ABN Method Activities Proposal
- 1.10.1. Block 1: Numerical and Cardinal
  - 1.10.1.1. Search for Equivalent Sets
  - 1.10.1.2. Establishment of a Physical Pattern
  - 1.10.1.3. Pattern Sorting
  - 1.10.1.4. Numeric String Start of Counting
  - 1.10.1.5. Subitizing
  - 1.10.1.6. Estimate
- 1.10.2. Block 2: Number Structure and Comparison
  - 1.10.2.1. Introduction to the Ten
  - 1.10.2.2. Ordering, but not Counting
  - 1.10.2.3. Arrangement of Disordered Sets
  - 1.10.2.4. Interaction of Missing Elements
  - 1.10.2.5. Arrangement with Non-Manipulable Material
  - 1.10.2.6. Comparison of Real Objects
  - 1.10.2.7. Comparison of Figurative Elements
- 1.10.3. Block 3: Number Transformations
  - 1.10.3.1. Number Transformations
  - 1.10.3.2. Addition with the Number Line
  - 1.10.3.3. Subtraction with Toothpicks
  - 1.10.3.4. Finding the Double with Grid
  - 1.10.3.5. Finding Half with the Number Line
- 1.10.4. Assessment

An unique, key, and decisive educational experience to boost your professional development"

05

Methodology

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

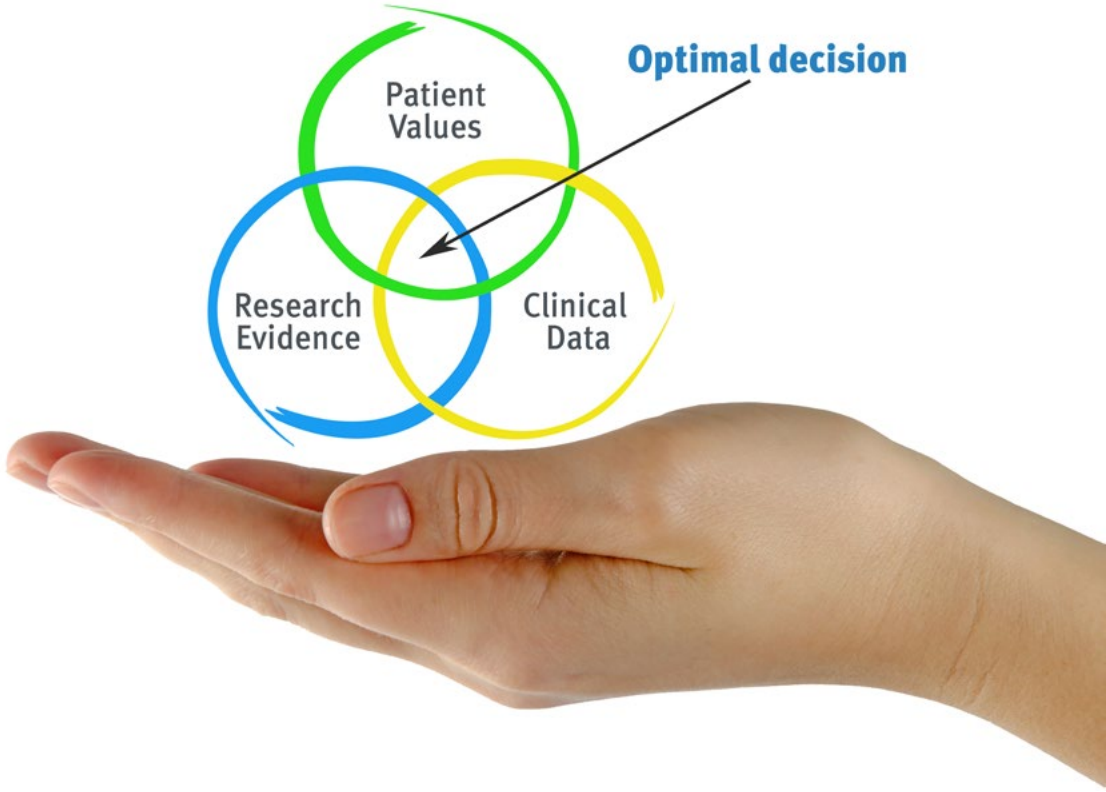
This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

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:

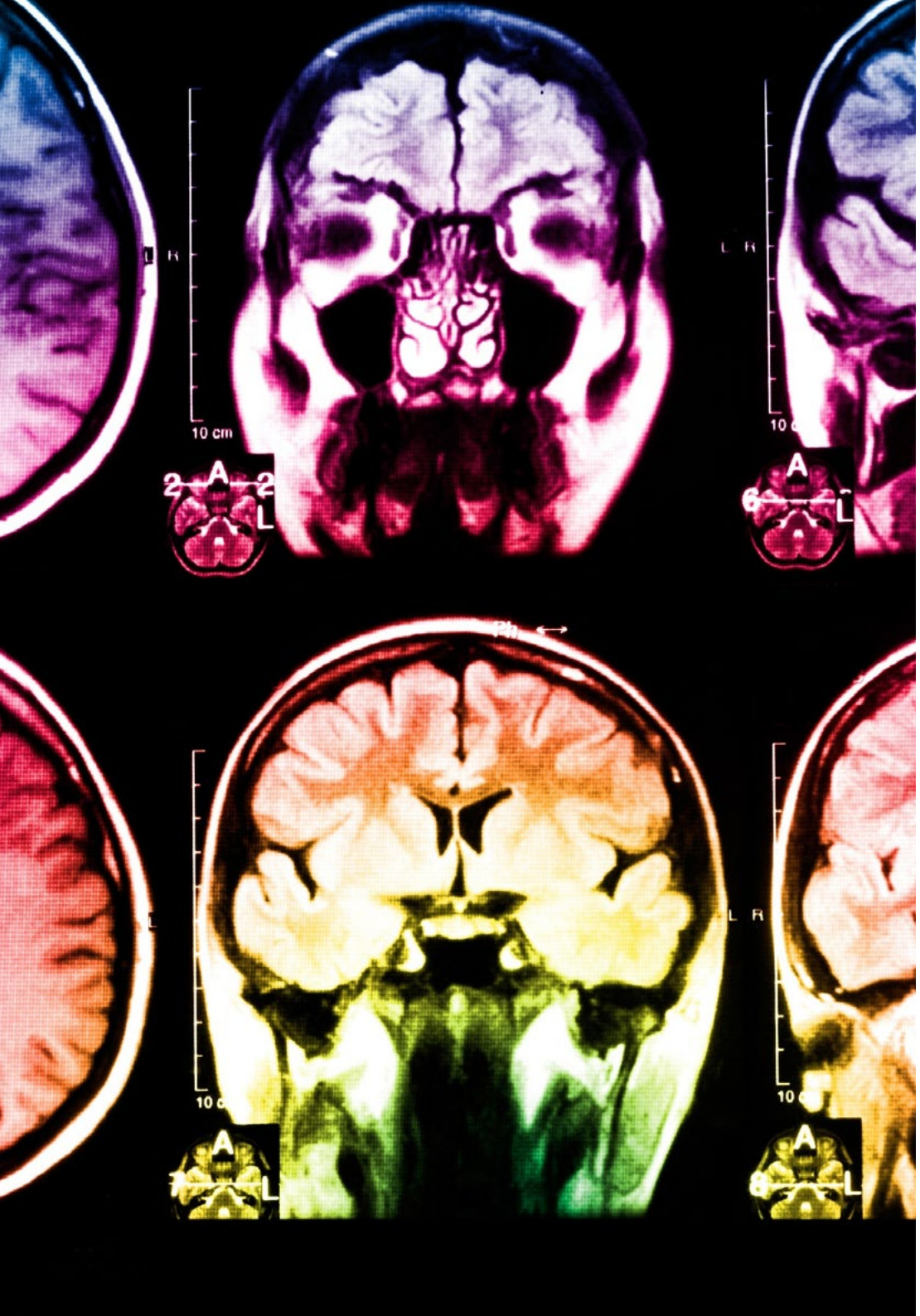
1. Educators who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their knowledge.
2. The learning process is solidly focused on practical skills that allow educators to better integrate the knowledge into daily practice.
3.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

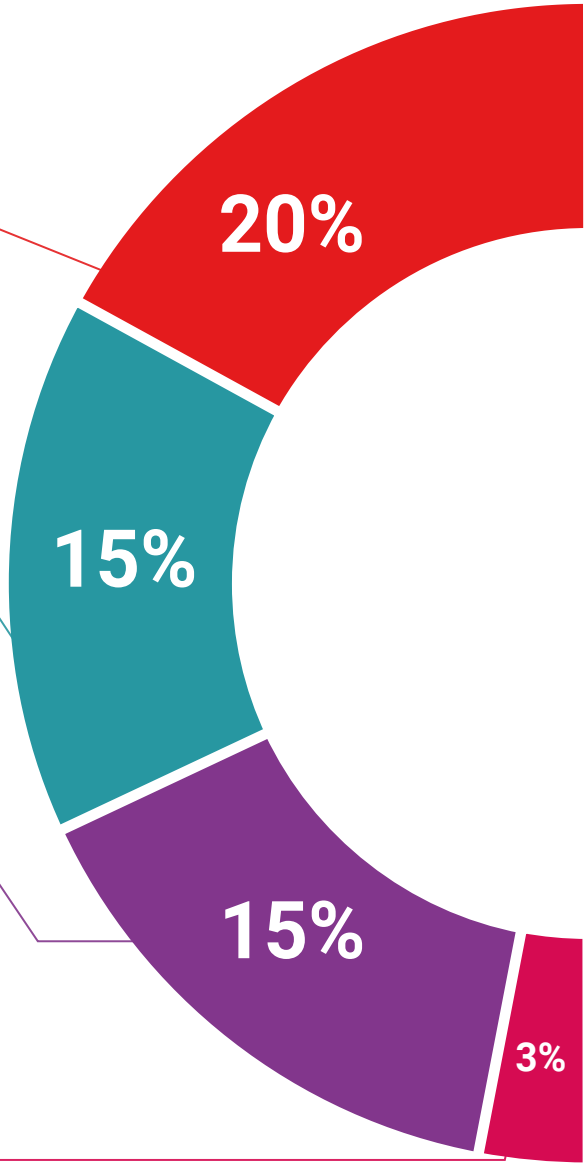
Interactive Summaries

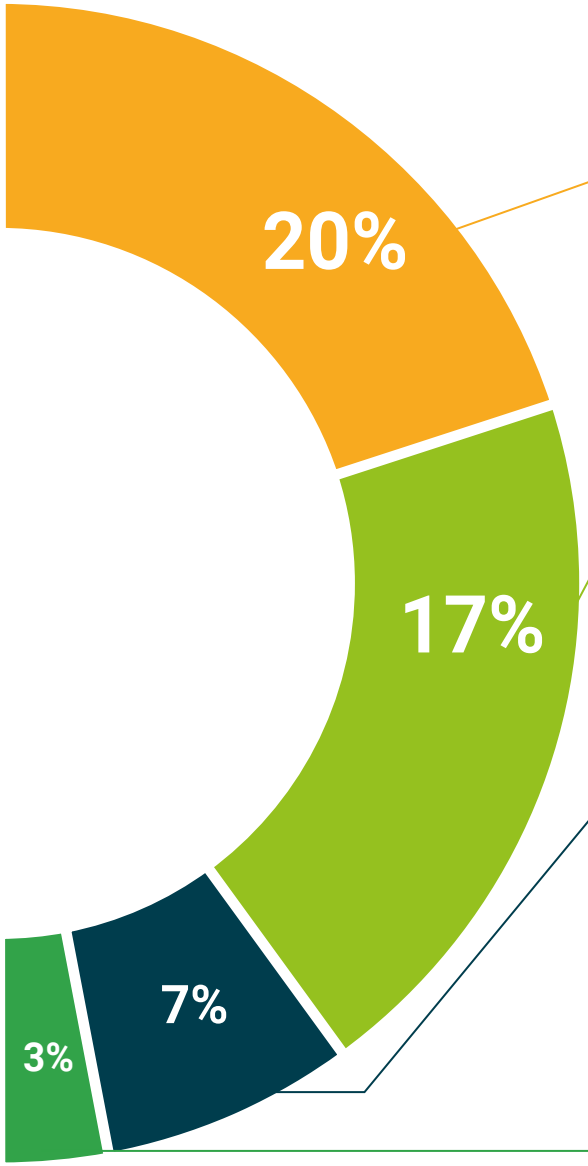
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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 Certificate in Problem Solving and Mental Calculation in Pre-School Education guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.

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

This program will allow you to obtain your **Postgraduate Certificate in Problem Solving and Mental Calculation in Pre-School Education** 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.

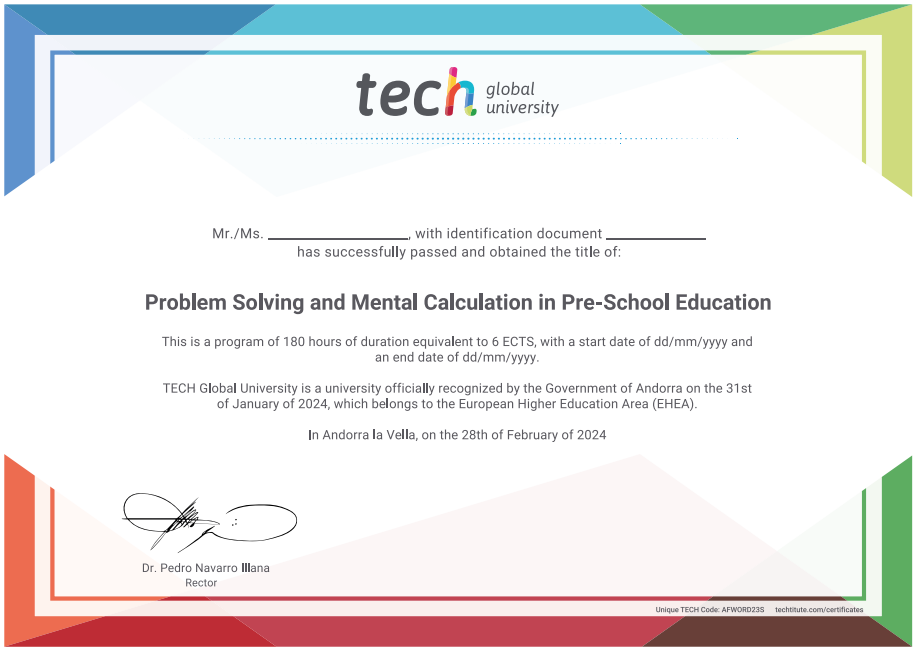
This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in Problem Solving and Mental Calculation in Pre-School Education**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**


tech global university

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

Problem Solving and Mental Calculation in Pre-School Education

This is a program of 180 hours of duration equivalent to 6 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.

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Postgraduate Certificate

Problem Solving and Mental Calculation in Pre-School Education

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

Postgraduate Certificate

Problem Solving and Mental Calculation in Pre-School Education

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