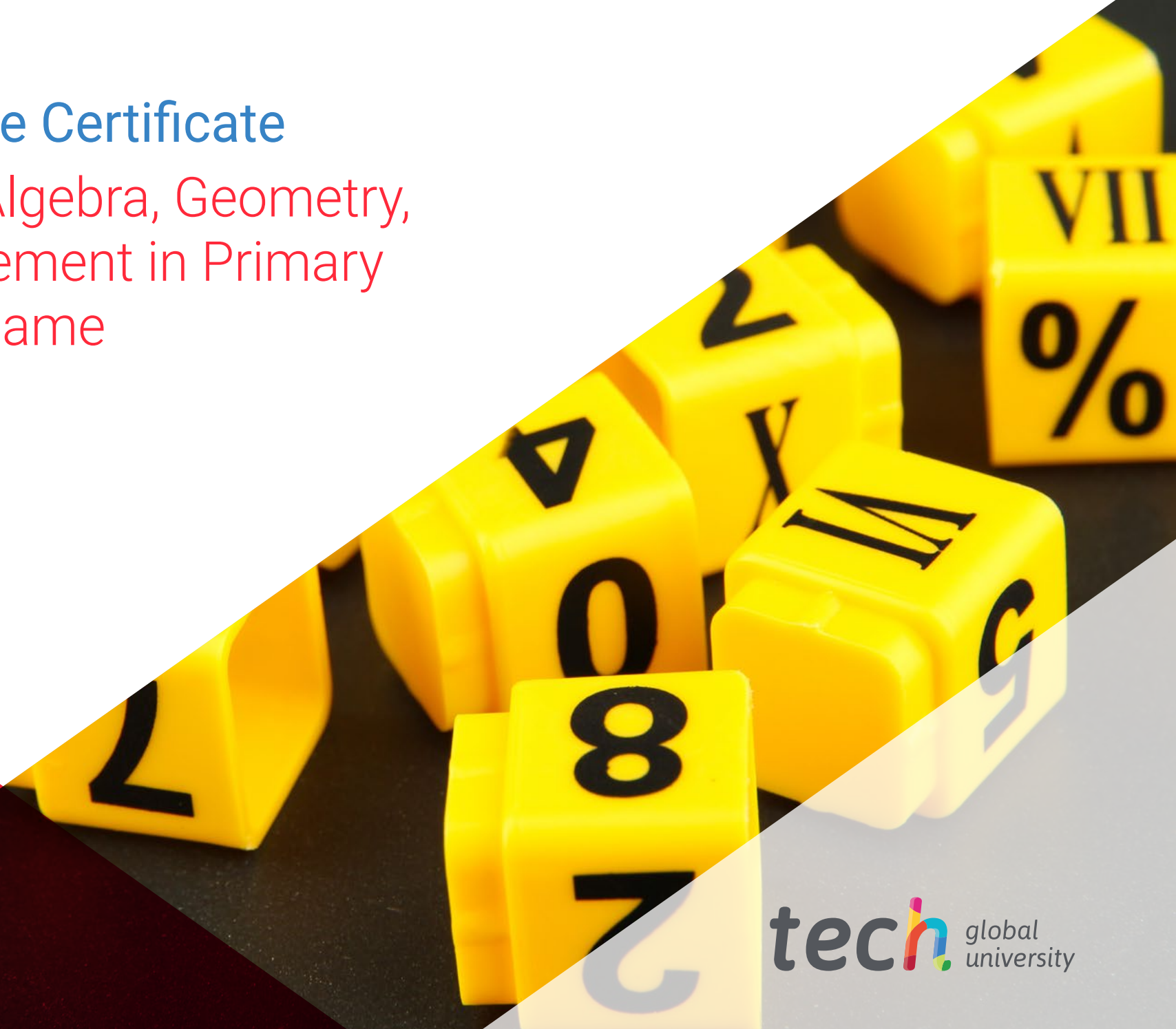


# Postgraduate Certificate

Arithmetic, Algebra, Geometry,  
and Measurement in Primary  
Education: Game





## Postgraduate Certificate

Arithmetic, Algebra, Geometry,  
and Measurement in Primary  
Education: Game

- » Modality: online
- » Duration: 6 weeks
- » Certificate: TECH Global University
- » Accreditation: 18 ECTS
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtitute.com/us/postgraduate-certificate/arithmetic-algebra-geometry-measurement-primary-education-game](http://www.techtitute.com/us/postgraduate-certificate/arithmetic-algebra-geometry-measurement-primary-education-game)

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# 01

# Introduction

It is a proven fact that the classical model of teaching mathematics has failed. Therefore, pedagogy has been researching for decades to establish new methods based on innovation, metacognition and problem solving, techniques that have shown numerous benefits in the integration of numerical concepts. Faced with the advance of these new processes, TECH has designed this university qualification that provides teachers with the tools to transform the learning of Arithmetic, Algebra, Geometry and Measurement through games in Primary Education. All this, throughout 150 hours that include the best theoretical and practical content totally online, with which the graduate will integrate the knowledge for the approach of the game as a resource for mathematical learning.





“

*A Postgraduate Certificate that will allow you to teach Arithmetic of a natural number and Mental Calculus techniques in an efficient way to your students”*

Since its beginnings in Ancient Greece, through rigor, mathematical demonstrations and its wide extrapolation to the different branches of science, numerous strategies have been developed to implement an effective method of study of mathematics. However, although it has evolved over the years and due to the complexity presented by the integration of its concepts and procedures, the objectives for which they were designed were not achieved. And this is where the current pedagogical innovation comes in, where the student is made an active participant in a dynamic and enriched environment to promote more efficient learning using the most fun tool: the game.

Therefore, it is essential to constantly update the specialized teacher in this subject and their communication skills in order to transmit knowledge efficiently, without losing an iota of rigor and gaining followers. For this reason, TECH has created this Postgraduate Certificate, to enable students to access a teaching that expands their competences when facing the difficulties and errors in the learning of mathematical operations in Pre-school Education.

All this, thanks to a 100% online methodology, which will enable the student to obtain an efficient learning thanks to the management of their study schedules as they wish. Likewise, the didactic contents that you will have in this qualification are elaborated by the best experts in Arithmetic, Algebra, Geometry and Measurement, so the knowledge that you will acquire will be completely applicable in your work experiences.

This **Postgraduate Certificate in Arithmetic, Algebra, Geometry, and Measurement in Primary Education: Game** contains the most complete and up-to-date educational program on the market. The most important features include:

- ♦ The development of practical cases presented by experts in Arithmetic, Algebra, Geometry and Measurement
- ♦ The graphic, schematic, and practical contents with which they are created, provide practical information on the disciplines that are essential for professional practice
- ♦ Practical exercises where the self-assessment process can be carried out to improve learning
- ♦ Its 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



*Learn in a dynamic environment, through collaborative activities and case studies offered by TECH in this exclusive Postgraduate Certificate"*

“

*Mathematics can be fun and you can transmit it through the tools you will acquire with this Postgraduate Certificate”*

The program includes in its teaching staff professionals from the sector who bring to this program the experience of their work, as well as recognized specialists from leading societies and prestigious 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 education programmed to learn in real situations.

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

*Delve into the game as a strategy for logical-mathematical learning and become a specialized and dynamic teacher.*

*Invest in your education, acquire the necessary skills and abilities to update and improve your professional future.*





02

# Objectives

In its maxim to provide students with an exclusive quality education, TECH ensures the fulfillment of a series of pre-established objectives in all its programs. In this way, the student who completes this program is guaranteed the acquisition of accurate knowledge in accordance with the current educational reality in this field. For this you will have 150 hours of the best theoretical and practical material, as well as a multitude of additional content with which you can delve in a personalized way in the difficulties and errors in the learning process of sum operations.







“

*Reach your most ambitious goals through a Postgraduate Certificate adapted to you and to the requirements of the current educational panorama”*



## General Objectives

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- ♦ Provide students with theoretical and practical knowledge that will allow them to acquire and develop essential competencies and skills for their role as teachers
- ♦ Design didactic games for learning mathematics
- ♦ Gamifying the classroom, a new resource for motivation and learning applied to mathematics

“

*Improve your skills in teaching mathematics through games and become a top-notch teacher”*







## Specific Objectives

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- ♦ Initiation in the concept of quantity, numerical expression and arithmetic operations, through manipulation and experimentation
- ♦ Design materials adapted to the learning of number, arithmetic, operations and algebra
- ♦ Know the natural number and the decimal numbering system
- ♦ Understand the sum, multiplicative and division structure and the possible difficulties and errors in applying it
- ♦ Understand the concept of decimal numbers within the Elementary School Education syllabus, as well as their arrangement, comparison and basic operations
- ♦ Explore the measurement of magnitudes and difficulties in the measurement process

# 03

# Course Management

TECH includes in all its programs the support of a faculty formed by specialized teams in the area of study. For this reason, for this Postgraduate Certificate has selected a team of experienced teachers with a wide and extensive experience that provide students with the experience of their professional background. In this way, graduates will be able to draw on their experience, as well as the practice in the most current context to update and implement innovative strategies in the development of their educational practice.







“

*Delve into the teaching and learning of rational numbers from the hand of the best mathematical experts with this exclusive TECH program”*

## 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

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- ♦ 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

- ♦ TPR and Mathematics teacher at Peñalar College
- ♦ Secondary and High School Teacher
- ♦ Expert in management of educational centers
- ♦ Co-author of technology books with McGraw Hill Publishers
- ♦ 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.

## Professors

### Ms. Hitos, María

- ♦ Pre-school and Elementary School Education Teacher Specialized in Mathematics
- ♦ Pre-school and Primary Education Teacher
- ♦ Coordinator of the English Department in Pre-school
- ♦ Linguistic Qualification in English for the Community of Madrid

### Ms. Iglesias Serranilla, Elena

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

### D. López Pajarón, Juan

- ♦ Secondary and High School Science Teacher at the Montesclaros School of the Educare Group
- ♦ Coordinator and Head of Educational Projects in Secondary and High School
- ♦ Technician at Tragsa
- ♦ 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**

- ♦ Specialized Teacher in mathematics didactics and learning disorders
- ♦ Elementary Education Teacher
- ♦ Elementary School Education Cycle Coordinator
- ♦ Specialized in Special Education and Mathematics teaching
- ♦ Graduate in Teaching

04

# Structure and Content

The design of the content of this Postgraduate Certificate has been carried out by a team of teachers who are experts in Mathematics, specifically in the teaching of Arithmetic, Algebra, Geometry and Measurement for Elementary Education. Therefore, they have included 150 hours of the best theoretical, practical and additional content presented in different audiovisual formats. With the use of the revolutionary pedagogical methodology of TECH, the *Relearning*, the student will attend a natural and progressive teaching, without the need to invest hours need to spend hours memorizing. In this way, graduates are guaranteed an unparalleled educational experience, adapted to the demands and needs of all students who access this program.





“

*You will educate in a practical and enjoyable way with this university qualification designed by experts in Arithmetic, Algebra, Geometry and Measurement”*

**Module 1. Arithmetic, Algebra and Measurement: Games**

- 1.1. Natural Number and its didactics
  - 1.1.1. Natural Numbers and Decimal Numbering Systems in the School Curriculum
  - 1.1.2. Correspondence
  - 1.1.3. Natural Number
  - 1.1.4. Use of the Number
  - 1.1.5. Numbering Systems
  - 1.1.6. Decimal Numbering System
  - 1.1.7. Difficulties and Errors
  - 1.1.8. Teaching Stages and Strategies
  - 1.1.9. Materials
- 1.2. Arithmetic of a Natural Number
  - 1.2.1. Additive Structure
  - 1.2.2. Difficulties and Errors in the Process and Learning of Additive Operations
  - 1.2.3. Structure of Multiplication and Division
  - 1.2.4. Difficulties and Errors in the Learning of Multiplicative Operations
  - 1.2.5. Properties
  - 1.2.6. Additive Problems
  - 1.2.7. Classification of Multiplicative Problems
  - 1.2.8. School Curriculum
  - 1.2.9. Mental Calculation Techniques
- 1.3. Teaching and Learning Rational Numbers
  - 1.3.1. Rational Number and the Curriculum
  - 1.3.2. Fractions
  - 1.3.3. Operations with Fractions
  - 1.3.4. Equivalence
  - 1.3.5. Fraction Comparisons
  - 1.3.6. Teaching
  - 1.3.7. Materials





- 1.4. Teaching and Learning Decimal Numbers
  - 1.4.1. Decimal Numbers in the Official Curriculum
  - 1.4.2. History of Decimal Notation
  - 1.4.3. Decimal Numbers
  - 1.4.4. Expanding the Numbering System
  - 1.4.5. Operations with Decimal , Numbers
  - 1.4.6. Decimal Approximation
  - 1.4.7. How Many Decimal Places Does a Fraction Have?
  - 1.4.8. The Introduction of Decimal Places from the Measurement
- 1.5. Measurement of Magnitudes and its Didactics
  - 1.5.1. Context and History
  - 1.5.2. Magnitudes and Measurement Direct Measures
  - 1.5.3. Objectives of the Teaching of Magnitudes and their Measurement in Elementary School Education
  - 1.5.4. Learning to Measure Quantities
  - 1.5.5. Difficulties and Errors in the Learning of Magnitudes and their Measurement
  - 1.5.6. Unit of Measure
  - 1.5.7. Direct Measurement Measurement Procedures
  - 1.5.8. Indirect Measurement and Proportionality
  - 1.5.9. Arithmetic Proportionality
- 1.6. Geometry in the Plane
  - 1.6.1. Geometry in the Curriculum
  - 1.6.2. Beginning of Geometry
  - 1.6.3. Elements of Geometry
  - 1.6.4. Polygonal
  - 1.6.5. Polygons
  - 1.6.6. Triangles
  - 1.6.7. Quadrilaterals
  - 1.6.8. Curvilinear Figures
- 1.7. Geometry in Space and Geometric Movements in the Plane
  - 1.7.1. Curricular Considerations
  - 1.7.2. Object Recognition Geometric Objects
  - 1.7.3. Angles in Space
  - 1.7.4. Polyhedra
  - 1.7.5. Round Bodies
  - 1.7.6. Isometries in the Curriculum
  - 1.7.7. What is Symmetry?
  - 1.7.8. Geometric Transformations
- 1.8. The contributions of Piaget and the Van Hiele couple to the field of geometry
  - 1.8.1. Piaget's Research on the Development of Geometrical Concepts
  - 1.8.2. The Van Hiele Couple
  - 1.8.3. Level 0 Recognition Display
  - 1.8.4. Level 1 Analysis
  - 1.8.5. Level 2 Informal Deduction
  - 1.8.6. Level 3 Formal Deduction
  - 1.8.7. Level 4 Rigor
  - 1.8.8. Duval's Cognitive Theory
- 1.9. Statistics and Probability
  - 1.9.1. Statistics and Probability in the School Curriculum
  - 1.9.2. Statistics and its Applications
  - 1.9.3. Basic Concepts
  - 1.9.4. Tables and Graphs
  - 1.9.5. The Language of Probability Calculation
  - 1.9.6. Teaching Statistics and Probability
  - 1.9.7. Stages in Learning Statistics and Probability
  - 1.9.8. Errors and Difficulties in the Learning of Statistics and Probability
- 1.10. Learning Mathematics Through Games
  - 1.10.1. Introduction
  - 1.10.2. Game as a Resource for Learning
  - 1.10.3. Games as a Strategy for Logical-Mathematical Learning
  - 1.10.4. Importance of the Corners in Pre-school Education
  - 1.10.5. LEGO as a Resource
  - 1.10.6. Geometry and Fractions with LEGO Pieces
  - 1.10.7. EntusiasMat
  - 1.10.8. ABN

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 Arithmetic, Algebra, Geometry, and Measurement in Primary Education: Games 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 private qualification will allow you to obtain a **Postgraduate Certificate in Arithmetic, Algebra, Geometry, and Measurement in Primary Education: Games** 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.

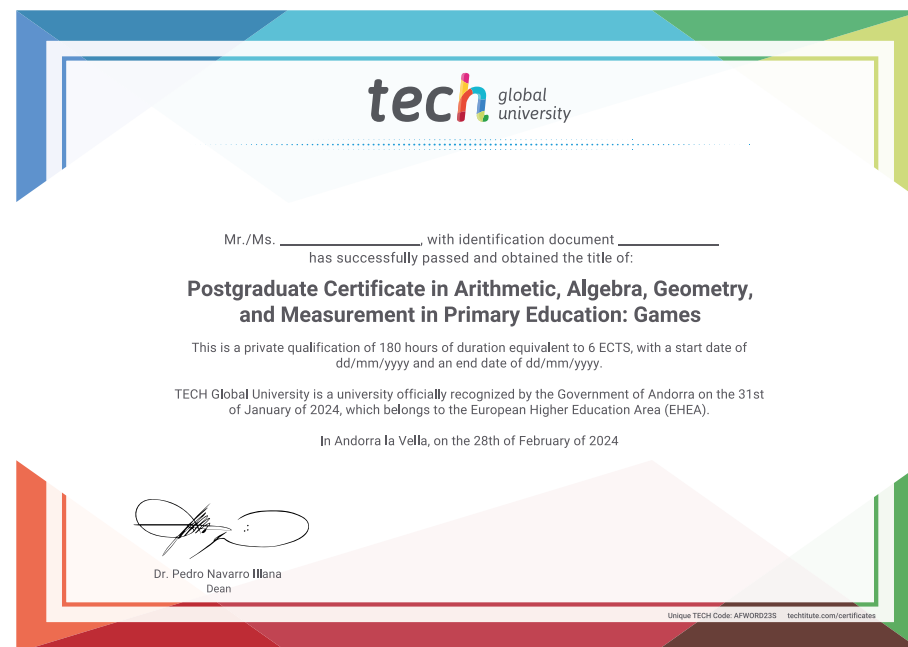
This **TECH Global University** private qualification, is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in Arithmetic, Algebra, Geometry, and Measurement in Primary Education: Games**

Modality: **online**

Duration: **6 months**

Accreditation: **6 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.





**Postgraduate Certificate**  
Arithmetic, Algebra, Geometry,  
and Measurement in Primary  
Education: Games

- » Modality: online
- » Duration: 6 weeks
- » Certificate: TECH Global University
- » Accreditation: 18 ECTS
- » Schedule: at your own pace
- » Exams: online

# Postgraduate Certificate

Arithmetic, Algebra, Geometry,  
and Measurement in Primary  
Education: Games