

# Postgraduate Certificate

Design and Creation of Teaching  
Materials: Mathematics Workshop  
and Play in the Classroom



## Postgraduate Certificate

### Design and Creation of Teaching Materials: Mathematics Workshop and Play in the Classroom

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

Website: [www.techtute.com/us/education/postgraduate-certificate/design-creation-teaching-materials-mathematics-workshop-play-classroom](http://www.techtute.com/us/education/postgraduate-certificate/design-creation-teaching-materials-mathematics-workshop-play-classroom)

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# 01

# Introduction

The reality of current education remains in constant change to adapt to the demand for new and efficient academic strategies. In this sense, ongoing research in the education sector points to the importance of implementing new strategies that are considerably more effective than those that have been used until now. For this reason, companies are looking for professionals specialized in the creation of didactic material that helps students to integrate knowledge, particularly in less popular subjects such as mathematics. In order for teachers to be able to design and produce and elaborate cutting-edge didactic materials, TECH has developed this complete program. A 100% online program that will allow you to implement the best tools in your practice and contribute to a first class teaching.





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*A Postgraduate Certificate that provides you with resources and strategies to implement Mathematics through play and, moreover, 100% online!"*

Famed psychologist William James stated: "If we remembered everything, we would be as ill as if we remembered nothing." Memory works selectively, and therefore, we remember much better what has had an impact on us, especially in a positive educational environment. Therefore, the design of innovative didactic materials that include the use of new technologies for teaching, specifically for mathematics, allows the student to develop a real interest. In this way, they will not only learn more and better, but will do so in a dynamic and innovative environment.

In this new era in teaching and with the purpose of providing teachers with didactic strategies, TECH, together with an experienced team of experts in Early Childhood Education, has developed a complete degree that gathers the most exhaustive information on the subject. It is a 150-hour program in which the graduate will delve into the use of manipulative materials in the classroom through the use of active and participatory methodological tools.

To do this, they will have an academic program taught in a totally online mode and during 6 weeks in which they will have unlimited access to a Virtual Campus, where they will find the best theoretical and practical material in different formats. That is to say, you will not only have access to the best and most updated syllabus in this field, but also to practical cases, detailed videos, complementary readings and much more. In this way, you will be able to perfect your practice and become an elite professional in the creation of educational projects beneficial to students in the learning of Mathematics in Early Childhood Education.

This **Postgraduate Certificate in Design and Creation of Teaching Materials: Mathematics Workshop and Play in the Classroom** contains the most complete and up-to-date 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 self-assessment can be used 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



*You will be able to download all the content to any electronic device from the Virtual Campus and consult it whenever you need it, even without an Internet connection"*

“

*Become a teacher guide capable of developing the most dynamic mathematical contents for the elaboration of manipulative materials"*

*Delve into the design and development of teaching materials to establish a participatory and renewed academic situation.*

*Get up to date through this complete program in Design and Creation of Teaching Materials: Mathematics Workshop and Play in the Classroom and become an elite teacher.*

The program includes in its teaching staff a team of professionals from the sector who pour into this course the experience of their work, in addition to recognized specialists from reference 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.



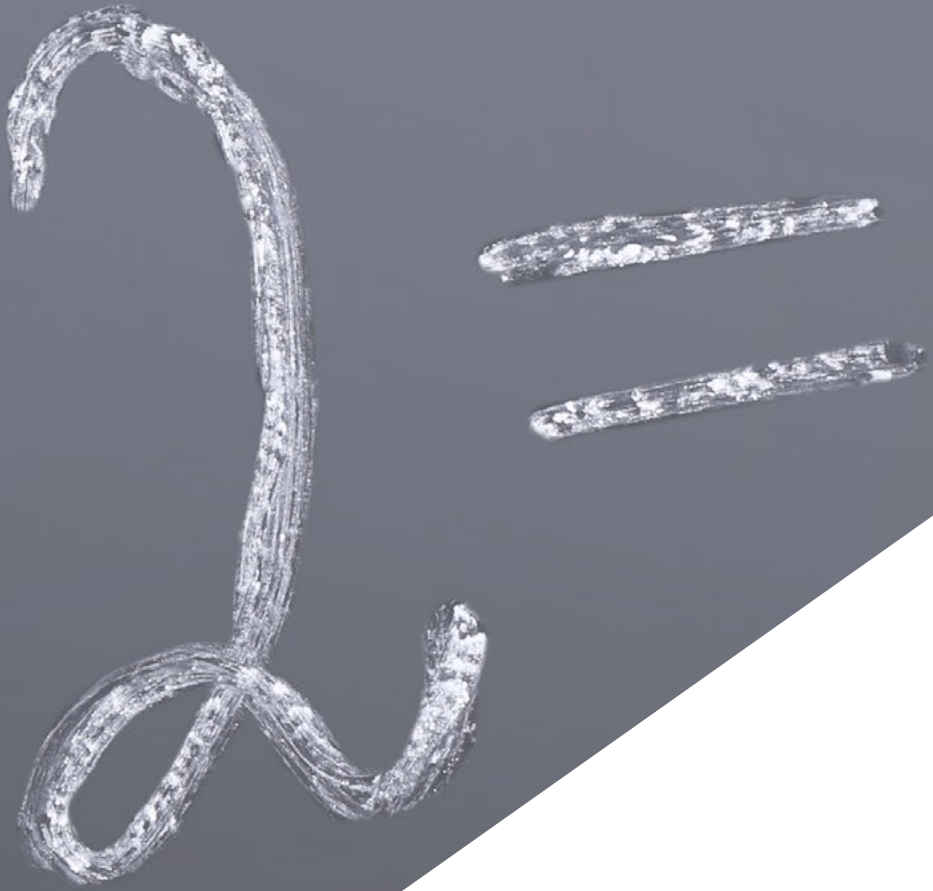
# 02

# Objectives

The numerous investigations that have been carried out in the field of Education have allowed the development of new pedagogical strategies according to the students' needs. Therefore, the ultimate goal of this program is to make available to the teaching professional the most cutting-edge information related to the use of manipulative materials in the classroom. Therefore, you will be able to implement the most effective academic tools in your professional practice in favor of a first level education in only 6 weeks of completely online teaching.







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*Enhance the development of your students and achieve your most ambitious goals with the most updated and comprehensive program in the current academic market"*



## 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
- Gamify the classroom, a new resource for motivation and learning applied to mathematics

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*Take advantage of the unique opportunity for professional and personal growth offered exclusively by this TECH Postgraduate Certificate”*





## Specific Objectives

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- ♦ Know the basic principles for the elaboration of resources and teaching materials
- ♦ Design materials adapted to the learning of measurement quantities
- ♦ Design materials adapted to the learning of probability and statistics
- ♦ Design materials adapted to the learning of geometry
- ♦ Relate the teaching of mathematics to other disciplines
- ♦ Create audiovisual resources for teaching mathematics
- ♦ Use comics as a didactic resource in the teaching of mathematics
- ♦ Create and implement practical workshops for the consolidation of mathematical concepts
- ♦ Understand geometry within the curricular framework of Pre-school and Elementary School Education
- ♦ Know the contributions of Piaget, Duval and the Van Hiele couple to the field of geometry

03

# Course Management

In structuring the faculty that makes up this Postgraduate Certificate, TECH has taken into account fundamental aspects of the candidates, such as their academic curriculum, professional background and quality of work. In this way, it has been possible to develop a teaching team of the highest level that will accompany the graduate in the course of this program. Therefore, the student will be able to make use of their experience and practice in the current context to get up to date in the implementation of the game as a didactic tool.



“

*You will achieve your objectives thanks to the support of a teaching team specialized in the design of materials for numerical learning"*

## 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
- ♦ Professor of Secondary and Baccalaureate Education
- ♦ 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.
- ♦ Industrial Engineer

## Professors

### Ms. Vega, Isabel

- ♦ Specialized Teacher in teaching mathematics and learning disabilities.
- ♦ Primary Education Teacher
- ♦ Elementary School Education Cycle Coordinator.
- ♦ Specialization in Special Education and Mathematics Didactics
- ♦ Graduate in Teaching

### Mr. López Pajarón, Juan

- ♦ Secondary and High School Science Teacher at Montesclaros College Educare Group
- ♦ Coordinator and Head of Educational Projects in Secondary and Baccalaureate.
- ♦ Technician at Tragsa
- ♦ Biologist with experience in the field of environmental conservation.
- ♦ Professional Master's Degree in Direction and Management of Educational Centers by the University International of La Rioja





**Ms. Hitos, María**

- ♦ Early Childhood and Elementary School Teacher Specialized in Mathematics.
- ♦ Pre-school and Primary Education Teacher
- ♦ Child English Department Coordinator
- ♦ Language qualification in English by 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.
- ♦ Specializing in New Learning Methodologies.

**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



*A unique, key, and decisive educational experience to boost your professional development”*

# 04

# Structure and Content

TECH uses the effective *Relearning* methodology in all its programs, with which the student will be able to integrate the most important concepts through repetition in different formats throughout the program. In this way, the hours of orthodox study and memorization are reduced, moving on to a progressive and natural acquisition of knowledge. Therefore, the professional who decides to take this program will have at his disposal an advanced and complete syllabus, which also presents innovative multimedia content. In this way, the graduate is guaranteed a unique academic experience, adapted to the demands and needs of today's labor market.

“

*This is your opportunity to access the best theoretical-practical contents of the academic panorama, only in the TECH library”*

**Module 1. Design and Development of Teaching Materials:  
Mathematics Workshop/Mathematics Games**

- 1.1. Mathematics Teaching Materials
  - 1.1.1. Introduction
  - 1.1.2. Teaching Resources
  - 1.1.3. Disadvantages of Teaching Materials
  - 1.1.4. Advantages of Teaching Materials
  - 1.1.5. Factors for the Utilization of Didactic Material
  - 1.1.6. Functions of Teaching Materials
  - 1.1.7. Didactic Material in the Teaching-Learning Process
  - 1.1.8. Types of Material
- 1.2. Introduction to the Design and Development of Teaching Materials
  - 1.2.1. Introduction
  - 1.2.2. Introduction to the Design of Teaching Materials
  - 1.2.3. Establishment of a Didactic Situation
  - 1.2.4. Design and Development of Didactic Material
  - 1.2.5. Didactic material to Support the Teaching-Learning Process
  - 1.2.6. Adequacy of the Material for Teaching Purposes
  - 1.2.7. Assessment of Didactic Material
  - 1.2.8. Self-evaluation
- 1.3. Manipulative Materials
  - 1.3.1. Introduction
  - 1.3.2. Logic Blocks
  - 1.3.3. The Abacus
  - 1.3.4. Multibase Blocks
  - 1.3.5. Cuisenaire Strips
  - 1.3.6. The Geoplane
  - 1.3.7. The Tangram
  - 1.3.8. Meters, Scales and Graduated Glasses
  - 1.3.9. Other Materials



- 1.4. Use of Manipulative Materials in the Classroom
  - 1.4.1. Active and Participative Methodology
  - 1.4.2. Manipulative Materials
  - 1.4.3. Introducing Manipulative Materials in the Classroom through Challenges
  - 1.4.4. Criteria for Manipulative Materials
  - 1.4.5. Development of the Students
  - 1.4.6. The Teacher as Project Guide
  - 1.4.7. Mathematical Contents for the Elaboration of Manipulative Materials
  - 1.4.8. Classroom Work Project
  - 1.4.9. The Teacher and Teaching Materials
- 1.5. Numerical Learning Materials
  - 1.5.1. Introduction
  - 1.5.2. Types of Numbers: Natural, Integer, Fractional and Decimal Numbers
  - 1.5.3. Contents
  - 1.5.4. Logical-Mathematical Thinking
  - 1.5.5. Materials for Working with Integers
  - 1.5.6. Materials for Working with Fractions
  - 1.5.7. Materials for Working with Decimals
  - 1.5.8. Materials for Working with Operations
  - 1.5.9. Crafts for Learning Numbers
- 1.6. Materials for Learning to Measure
  - 1.6.1. Introduction
  - 1.6.2. Units and Instruments for the Measurement of Magnitudes
  - 1.6.3. Contents of the Measurement Block
  - 1.6.4. Didactic Resources
  - 1.6.5. Materials for Working with Units of Length
  - 1.6.6. Materials for Working with Units of Mass
  - 1.6.7. Materials to Work with Capacity or Volume Units
  - 1.6.8. Materials to Work with Surface Units
  - 1.6.9. Materials to Work with Time and Money Units
- 1.7. Geometric Learning Materials
  - 1.7.1. Block 3: Geometry
  - 1.7.2. Importance of Geometry
  - 1.7.3. Puzzle of the Blind Hen
  - 1.7.4. Square Geoplane
  - 1.7.5. Orient Yourself
  - 1.7.6. The Boat Game
  - 1.7.7. Chinese Tangram
  - 1.7.8. Memory Game
- 1.8. Comic Books for Learning Mathematics
  - 1.8.1. Introduction
  - 1.8.2. Comic Concept
  - 1.8.3. Comic Structure
  - 1.8.4. Educational Uses of Digital Comics
  - 1.8.5. Objectives Achieved According to Experiences Developed
  - 1.8.6. Proposed Method of Use
  - 1.8.7. How to Use it According to the Teaching Cycles?
  - 1.8.8. Proposed Activities
  - 1.8.9. Comics, ICT and Mathematics
- 1.9. Audiovisual Resources in the Teaching-Learning of Mathematics
  - 1.9.1. Audiovisual Language: A New Language, A New Method
  - 1.9.2. Benefits of Audiovisual Language in Education
  - 1.9.3. Audiovisual Competence in the Classroom
  - 1.9.4. 10 Principles for the Use of Audiovisuals in the Classroom
  - 1.9.5. Audiovisual Resources and the Teaching of Mathematics
  - 1.9.6. Importance of the Use of New Technologies in Mathematics
  - 1.9.7. Video in Mathematics
  - 1.9.8. Mathematical Photography
- 1.10. The Game in the Teaching Methods of Mathematics
  - 1.10.1. Introduction
  - 1.10.2. Game Concept
  - 1.10.3. The Importance of the Game
  - 1.10.4. The Importance of Games in Mathematics
  - 1.10.5. Advantages of the Game
  - 1.10.6. Disadvantages of the Game
  - 1.10.7. Phases of the Game
  - 1.10.8. Strategies
  - 1.10.9. Mathematical Games

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.





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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 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.*



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*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

This Postgraduate Certificate in Design and Creation of Teaching Materials: Mathematics Workshop and Play in the Classroom guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.



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*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 a **Professional Master's Degree diploma in Medical 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.

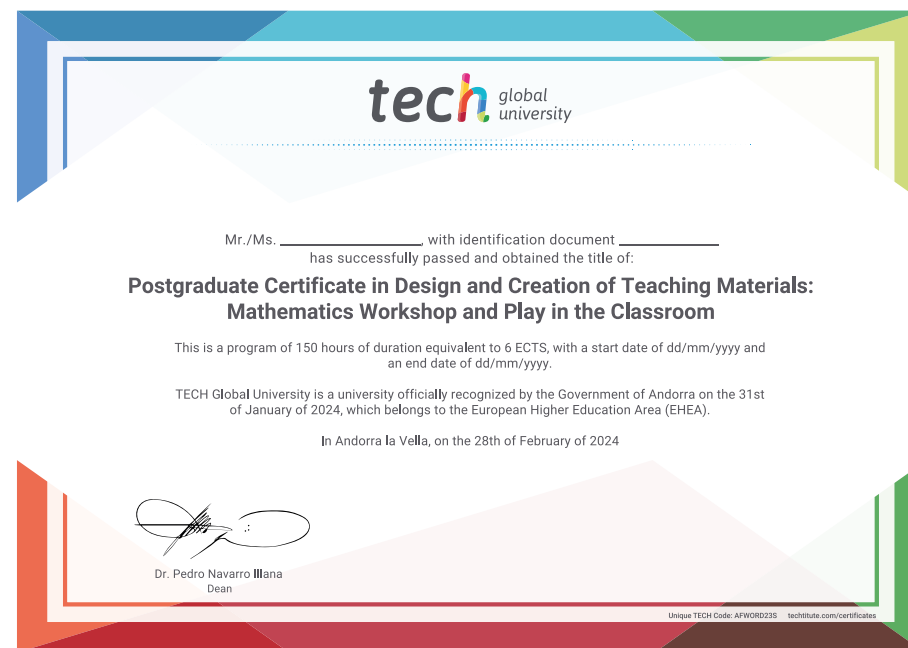
This **TECH Global University** title, is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in Design and Creation of Teaching Materials: Mathematics Workshop and Play in the Classroom**

Modality: **online**

Duration: **12 months**

Accreditation: **60 ECTS**





future  
health confidence people  
education information tutors  
guarantee accreditation teaching  
institutions technology learning  
community commitment  
personalized service innovation  
knowledge present  
development language  
virtual classroom



**Postgraduate Certificate**  
Design and Creation of  
Teaching Materials:  
Mathematics Workshop  
and Play in the Classroom

- » Modality: online
- » Duration: 6 weeks
- » Certificate: TECH Global University
- » Accreditation: 60 ECTS
- » Schedule: at your own pace
- » Exams: online

# Postgraduate Certificate

Design and Creation of Teaching  
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