Postgraduate Diploma

Mathematics Teacher Training in High School Education

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Postgraduate Diploma
Mathematics Teacher Training in High School Education

- Modality: **online**
- Duration: **6 months**
- Certificate: **TECH Technological University**
- Dedication: **16h/week**
- Schedule: **at your own pace**
- Exams: **online**

Website: **www.techtitute.com/pk/education/postgraduate-diploma/postgraduate-diploma-mathematics-teacher-training-high-school-education**

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01

Introduction

The educational and cultural value of mathematics makes it indispensable in the teaching of all students. It is especially relevant in the high school stage, where it deepens in a subject that will help them to develop not only in their daily life, but also throughout their professional career. However, there are certain barriers and learning difficulties that the teacher must break down through creativity and innovative methodology. To achieve this goal, TECH provides this 100% online program, which provides the most advanced knowledge about Mathematics syllabus design, teaching, and cognitive processes. All this, in addition, with multimedia content, prepared by a team of teachers specialized in the Education sector.

This 100% online Postgraduate Diploma will lead you to apply the most innovative pedagogical methodologies in Mathematics"

Mathematics learning is key to students' educational, professional, and personal development. Although it is true that there are certain factors that influence the negative perception of this matter. This is a challenging wall for the teachers who teach this subject, especially to students in High School.

Given this reality, there are multiple teaching tools that make mathematics an attractive and easier discipline to learn. In this line, TECH has designed this Postgraduate Diploma in Mathematics Teacher Training in High School Education, which provides the teacher with the most effective techniques and methodologies for teaching this subject.

A program that will delve over 6 months into the evolution of Mathematics, the use of Gamification as a learning method, the syllabus design and the recommendations provided by the experts who teach this university program for the creation of efficient programs and teaching units.

In this way, students will have access to an advanced and intensive syllabus that is complemented by video summaries of each topic, detailed videos, specialized readings, and practical case studies. In addition, thanks to the Relearning system, you will be able to progress through the content in a much more natural way and reduce the long hours of study.

A unique opportunity to progress in the education sector through a university flexible and convenient program. Students only need an electronic device with an Internet connection to be able to accessed, at any time, the contents hosted on the virtual platform. In this way, without fixed schedules and distributing the course load according to their needs, graduates will be able to combine this Postgraduate Diploma with their daily responsibilities.

This **Postgraduate Diploma in Geography and History Teacher Training in High School Education** contains the most complete educational program on the market. The most important features include:

- Practical cases presented by experts in education
- 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

The case studies provided in this university program give you a program and a teaching unit developed for teaching at the High School stage"

Stand out in the education sector by successfully applying the Flipped Classroom methodology in your mathematics classes"

Make your math classes more attractive through Gamification and cooperative learning thanks to this program.

You are in front of a Postgraduate Diploma of high level and compatible with your daily responsibilities. Enroll now.

The program's teaching staff includes professionals from the field who contribute their work experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

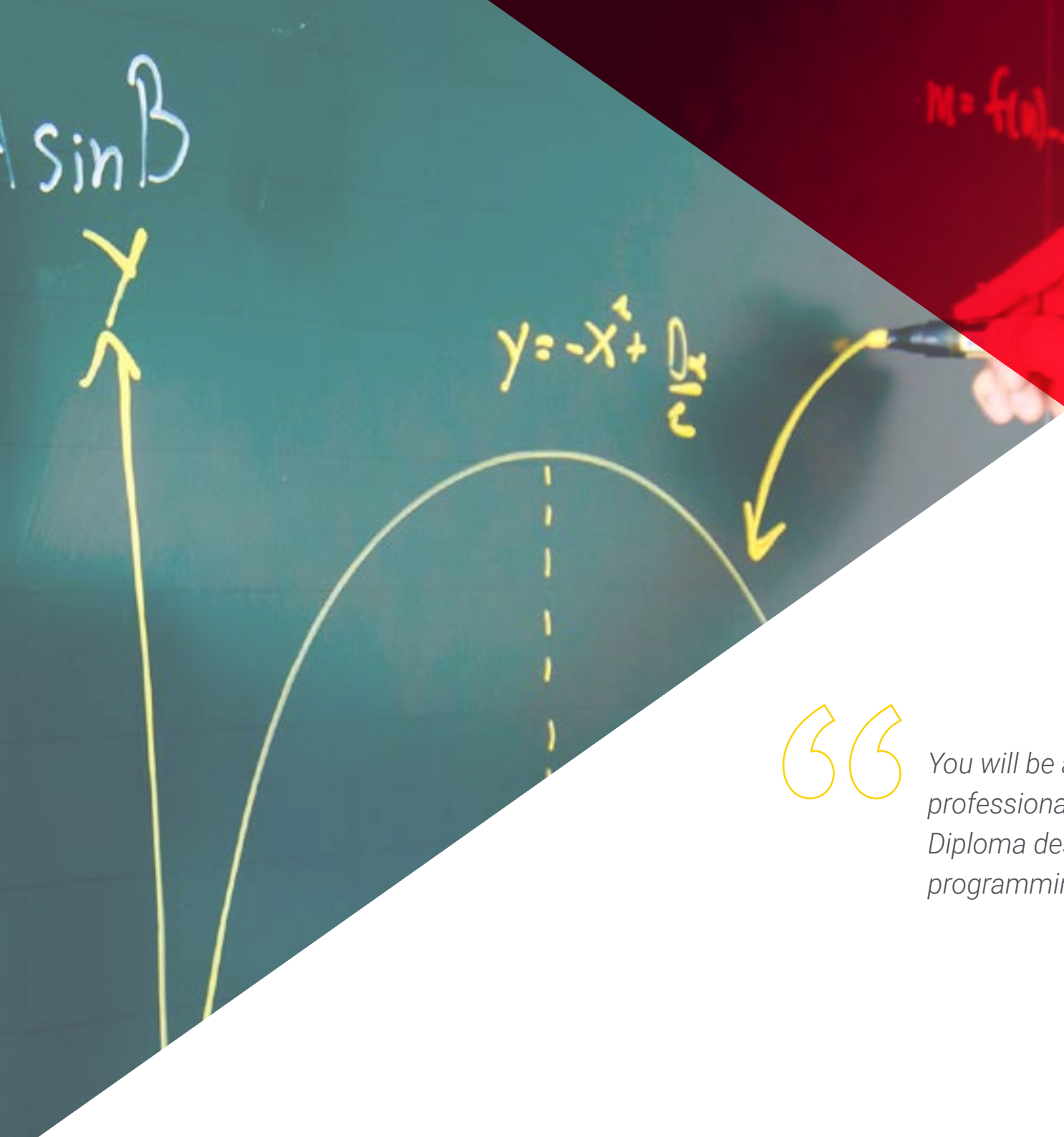
The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide immersive education programmed to learn in real situations.

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

02

Objectives

The objective of this Postgraduate Diploma is to provide students with advanced learning on the teaching-learning processes currently used in the subject of Mathematics in High School. A goal that will be possible to achieve thanks to the numerous multimedia teaching resources provided by TECH and the teacher's team that will guide the professional at all times.



You will be able to take a step forward in your professional career thanks to a Postgraduate Diploma designed for you to design the best programming in Mathematics"

General Objectives

- Introduce students to the world of teaching, from a global perspective in order to prepare them for their future employment
- Know the new tools and technologies applied to teaching
- Show the different options and ways the teacher can work in their post
- Promote the acquisition of communication and knowledge transmission skills and abilities
- Encourage continuing education for students

Get the tools you need to solve the main learning difficulties in mathematics in high school students"

Specific Objectives

Module 1. Complements for the Disciplinary Training of Mathematics

- Know the cultural importance of Mathematics throughout history
- Integrate the conceptual contents of Mathematics for the formation of the students of High School Education
- Comprehend the relation of history as a teaching principle
- Determine the teaching principles that can be derived from history in relation to Mathematics

Module 2. Mathematics Syllabus Design

- Define the concept of syllabus
- Detail the elements that make up the syllabus
- Explain the concept of syllabus design
- Describe the levels of concreteness of the syllabus
- Explain the different models of the syllabus
- Determine the aspects that should be taken into account in the elaboration of a teaching program

Module 3. Teaching of Mathematics

- Expose the most relevant learning theories in the world of Education and the main authors related to them
- Differentiate these theories and know their main characteristics
- Talk about behaviorism, cognitivism and constructivism
- Expose the concepts of classical conditioning and operant conditioning and their relationship in learning theories
- Explain what learning for the digital era and the theory of connectivism consist of
- Gain knowledge about the social theories of learning, their principles and their relation with digital learning
- Explain the concept of implicit theories and link them to the educational field

03

Course Management

The students who enter this program can count on a team of teachers versed in education and pedagogy with extensive experience in the sector. In this way, the professionals are guaranteed to receive in this Postgraduate Diploma the knowledge they need to progress as teachers in the area of Mathematics. In addition, the proximity of the faculty of this program will allow you to resolve any questions you may have about the content of this program.

You will have a team of teachers with extensive professional experience in the Education sector, who will guide you through this Postgraduate Diploma"

Management

Dr. Barboyon Combeyro, Laura

- Teacher of Primary Education and Postgraduate Studies
- Teacher in Postgraduate University Studies of High School Teacher Formation
- Teacher of Primary Education in several schools
- Doctor in Education from the University of Valencia
- Master's Degree in Psychopedagogy from the University of Valencia
- Degree in Primary School Education with a major in English Teaching from the Catholic University of Valencia San Vicente Mártir

04

Structure and Content

The syllabus of this Postgraduate Diploma is structured to provide in only 6 months the most valuable information for the teaching of Mathematics in High School. In this way, the students of this program will take an educational journey through the complements for the disciplinary formation of Mathematics, the syllabus design, and the teaching of this subject. It also has a library of multimedia resources that you can access whenever and wherever you want.

An advanced syllabus with great practical application to your day-to-day work as a teacher of mathematics for High School students"

Module 1. Complements for the Disciplinary Training of Mathematics

1.1. The Formative and Cultural Value of Mathematics in High School Education
- 1.1.1. The Cultural Importance of Mathematics throughout History
- 1.1.2. The importance of the Conceptual Contents of Mathematics (its Laws, Principles and Theories) for the Training and Education of the High School Student
- 1.1.3. Teaching Principles that can be Derived from History
- 1.1.4. Teaching Principles that can be Derived from the History of Mathematics

1.2. Cognitive and Metacognitive Processes in Mathematics
- 1.2.1. Cognitive Processes in Mathematics
- 1.2.2. Metacognitive Processes in Mathematics

1.3. Language and Mathematics
- 1.3.1. Language Development and Mathematics
- 1.3.2. Mathematical Language

1.4. Observation, Art and Mathematics
- 1.4.1. The Golden Number and Proportionality
- 1.4.2. Other Contributions of Mathematics to Art
- 1.4.3. Proposal for the Teaching of Geometry through Art

1.5. History in the Mathematics Classroom. Ancient Mathematics: Babylon and Egypt
- 1.5.1. Relevance of History in Science and Mathematics Education
- 1.5.2. What is the Most Appropriate Role for the Inclusion of the History of Mathematics in Teaching?
- 1.5.3. Genetic Method of Teaching Mathematics
- 1.5.4. The First Historical Records of Mathematics
- 1.5.5. Numbers in Egypt
- 1.5.6. Numbers in Babylon

1.6. Mathematics in Greece
- 1.6.1. The Greeks: Miletus
- 1.6.2. Schools of Thought: Thales and the Ionian School, Pythagoras and the Eleatic school
- 1.6.3. Athens
- 1.6.4. Euclid
- 1.6.5. Apollonius
- 1.6.6. The Alexandrians
- 1.6.7. Archimedes
- 1.6.8. Heron
- 1.6.9. Trigonometry
- 1.6.10. Algebra and Arithmetic

1.7. Mathematics in Asia, the Middle Ages and the Renaissance
- 1.7.1. Chinese Mathematics
- 1.7.2. Mathematics in India
- 1.7.3. The Arab Influence
- 1.7.4. Romans
- 1.7.5. The European Middle Ages
- 1.7.6. Medieval Mathematics
- 1.7.7. The Mathematics of the Renaissance
- 1.7.8. Perspective
- 1.7.9. Maps
- 1.7.10. Astronomy and Mathematics
- 1.7.11. Trigonometry
- 1.7.12. Arithmetic and Algebra
- 1.7.13. Logarithms
- 1.7.14. A New Relationship

1.8. The Scientific Method and the New Geometry
- 1.8.1. Bacon
- 1.8.2. Descartes
- 1.8.3. Galileo
- 1.8.4. Universities and Scientific Societies
- 1.8.5. Projective Geometry
- 1.8.6. Coordinate Geometry
- 1.8.7. Algebra and Geometry

1.9. Infinitesimal Calculus and Euler Geometry
- 1.9.1. Towards Calculus
- 1.9.2. Newton and Leibniz
- 1.9.3. Mathematics in the 18th Century
- 1.9.4. The Bernoulli
- 1.9.5. Euler

1.10. Gamification of Mathematics

Module 2. Mathematics Syllabus Design

2.1. Syllabus and its Structure
- 2.1.1. School Syllabus: Concept and Components
- 2.1.2. Syllabus Design: Concept, Structure and Functioning
- 2.1.3. Levels of Syllabus Specification
- 2.1.4. Syllabus Model
- 2.1.5. Educational Programming as a Working Tool in the Classroom

2.2. Legislation as a Guide to Syllabus Design and Key Competencies
- 2.2.1. Review of Current National Educational Legislation
- 2.2.2. What are Competencies?
- 2.2.3. Types of Skills
- 2.2.4. Key Competencies
- 2.2.5. Description and Components of Key Competencies

2.3. The Spanish Education System Teaching Levels and Modalities
- 2.3.1. Education System: Interaction between Society, Education and the School System
- 2.3.2. The Educational System: Factors and Elements
- 2.3.3. General Characteristics of the Spanish Educational System
- 2.3.4. Configuration of the Spanish Educational System
- 2.3.5. High School Education
- 2.3.6. Baccalaureate
- 2.3.7. Vocational Training
- 2.3.8. Artistic Education
- 2.3.9. Language Teaching
- 2.3.10. Sports Education
- 2.3.11. Adult Education

2.4. The Teaching Programming I: Curricular Elements
- 2.4.1. Subjects Taught in the Specialty
- 2.4.2. What Is a Teaching Plan? Characteristics and Functions
- 2.4.3. Basic Elements of a Teaching Plan
- 2.4.4. Description of the Elements of a Teaching Plan
- 2.4.5. Cross-cutting Elements

2.5. Teaching Plan II: Methodology, Resources, Evaluation and Attention to Diversity
- 2.5.1. General Considerations on the Methodology
- 2.5.2. Learning Models
- 2.5.3. Active Learning Methodologies
- 2.5.4. Methodology as a Section of the Teaching Plan
- 2.5.5. Didactic Resources
- 2.5.6. Complementary and Extracurricular Activities
- 2.5.7. General Considerations for Scheduling the Evaluation Process
- 2.5.8. Procedures and Instruments for the Evaluation of Student Learning
- 2.5.9. Qualification Criteria
- 2.5.10. Recovery of Subjects Pending from Previous Courses
- 2.5.11. Attention to Diversity Measures
- 2.5.12. Assessment of the Program and Teaching Practice

2.6. Design of a Teaching Unit I: Objectives, Contents and Competences
- 2.6.1. Introduction to the Teaching Unit
- 2.6.2. Contextualization
- 2.6.3. Teaching Objectives
- 2.6.4. Competencies
- 2.6.5. Contents
- 2.6.6. Relation of Objectives, Contents, Competencies, Evaluation Criteria and Evaluable Learning Standards

2.7. Creation of the Mathematics Teaching Unit

2.8. Recommendations and Common Syllabus Design Errors. The Teaching Plan in Career Training
- 2.8.1. Layout of the Elements of a Teaching Plan
- 2.8.2. Layout of the Elements of a Teaching Unit
- 2.8.3. Most Common Errors in the Teaching Plans and Teaching Units
- 2.8.4. Planning in Career Training

2.9. Example of a Teaching Plan for the 1st year of High School Education
- 2.9.1. Context
- 2.9.2. General Stage Objectives and Competencies
- 2.9.3. Contents, Evaluation Criteria and Evaluable Learning Standards
- 2.9.4. Specification of the Cross-Cutting Elements
- 2.9.5. Methodology and Activities
- 2.9.6. Materials and Resources
- 2.9.7. Evaluation Procedures and Instruments and Grading Criteria
- 2.9.8. Attention to Diversity

2.10. Example of a Teaching Unit for the 1st year of High School Education
- 2.10.1. Context
- 2.10.2. Teaching Objectives, Contents, Evaluation Criteria, Evaluable Learning Standards and Competencies
- 2.10.3. Methodology, Activities and Resources
- 2.10.4. Assessment
- 2.10.5. Attention to Diversity Measures

Module 3. Teaching Methods of Mathematics

3.1. Types of Learning
- 3.1.1. Conductism Applied to Mathematics
- 3.1.2. Cognitivism Applied to Mathematics
- 3.1.3. Constructivism Applied to Mathematics

3.2. Learning Strategies in Mathematics

3.3. Flipped Classroom applied to Mathematics

3.3.1. The Traditional Class
- 3.3.2. What Is the Flipped Classroom?
- 3.3.3. Advantages of the Flipped Classroom applied to Mathematics
- 3.3.4. Disadvantages of the Flipped Classroom applied to Mathematics
- 3.3.5. Example of a Flipped Classroom applied to Mathematics

3.4. Innovative Pedagogical Methodologies in Mathematics
- 3.4.1. Gamification in Mathematics
- 3.4.2. Portfolios/*e-Portfolios* applied to Mathematics
- 3.4.3. The Learning Landscape Applied to Mathematics
- 3.4.4. Problem-Based Learning (PBL) in Mathematics
- 3.4.5. Cooperative Learning in Mathematics
- 3.4.6. Comprehension Projects applied to Mathematics
- 3.4.7. Metacognitive Learning and Mathematics
- 3.4.8. Flipped Classroom applied to Mathematics
- 3.4.9. Peer Mentoring in Mathematics
- 3.4.10. Conceptual Jigsaw Puzzles applied to Mathematics
- 3.4.11. Digital Murals Applied to Mathematics

3.5. Math and Its Difficulties
- 3.5.1. Definition of Learning Difficulties in Mathematics
- 3.5.2. Learning Difficulties in Mathematics Related to: The Nature of Math Itself, The Organization and Methodology of Teaching, Related to the Student
- 3.5.3. Common Errors: Problem Solving, In the Steps of the Algorithm
- 3.5.4. Dyscalculia as a Specific Learning Difficulty: Semativ, Perceptive, Procedural
- 3.5.5. Causes of Mathematical Learning Difficulty (MLD)
  - 3.5.5.1. Contextual Factors
  - 3.5.5.2. Cognitive Factors
  - 3.5.5.3. Neurobiological Factors

3.6. Structure of the Student's Mathematics e-*Portfolio*
- 3.6.1. Introduction
- 3.6.2. Objectives and Goals to be Achieved
- 3.6.3. Evidence of Learning in Mathematics
- 3.6.4. Selected Mathematics Work Samples
  - 3.6.4.1. Mathematics Digital Works
  - 3.6.4.2. Non-Digital Mathematics Work
  - 3.6.4.3. Selection of Opinions
  - 3.6.4.4. Mathematics Exams and Tests
  - 3.6.4.5. Mathematics Notes
  - 3.6.4.6. Mathematics Footnotes
  - 3.6.4.7. Journal of Reflection on the Mathematics Learning Process
- 3.6.5. Personal Reflection on Mathematics Work Completed
- 3.6.6. Assessment of Portfolio in Mathematics

3.7. Conceptual Jigsaw Puzzles applied to Mathematics
- 3.7.1. Definition of Jigsaw Puzzles
- 3.7.2. What is a Conceptual Jigsaw Puzzle?
- 3.7.3. Advantages of Conceptual Jigsaw Puzzles in Mathematics
- 3.7.4. Disadvantages of Conceptual Jigsaw Puzzles in Mathematics
- 3.7.5. Example of Conceptual Jigsaw Puzzle Applied to Mathematics

3.8. Games in Adolescence (High School Students)

3.9. Evaluation and the Teaching-Learning Process
- 3.9.1. Evaluation and Teaching-Learning
- 3.9.2. Concept of Learning Evaluation
- 3.9.3. Headings
- 3.9.4. Evaluation of the Mathematical Methodology
- 3.9.5. Evaluation of Mathematical Talent

3.10. Teaching to Think in Mathematics

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:

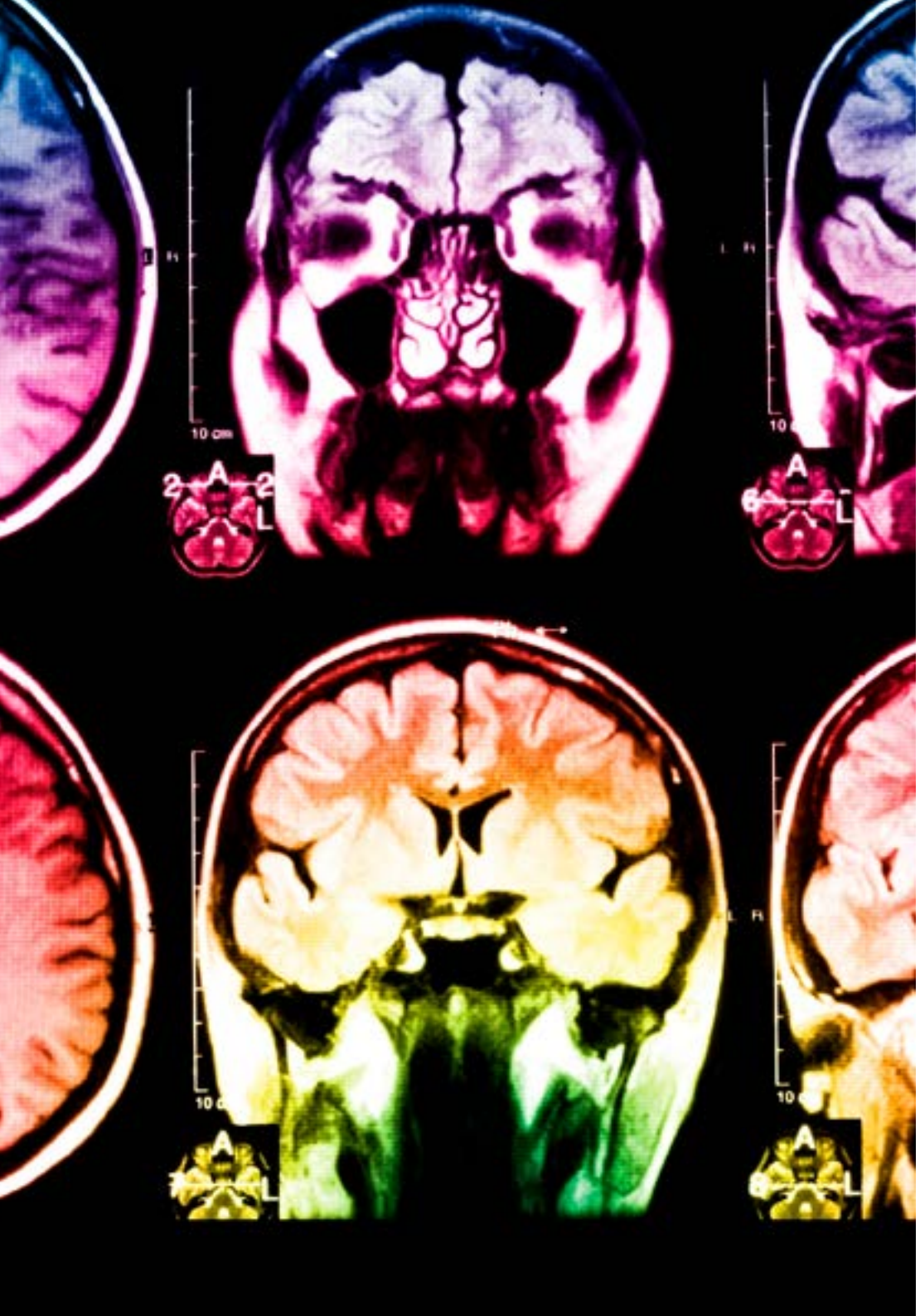
1. Educators who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their knowledge.
2. The learning process is solidly focused on practical skills that allow educators to better integrate the knowledge into daily practice.
3.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

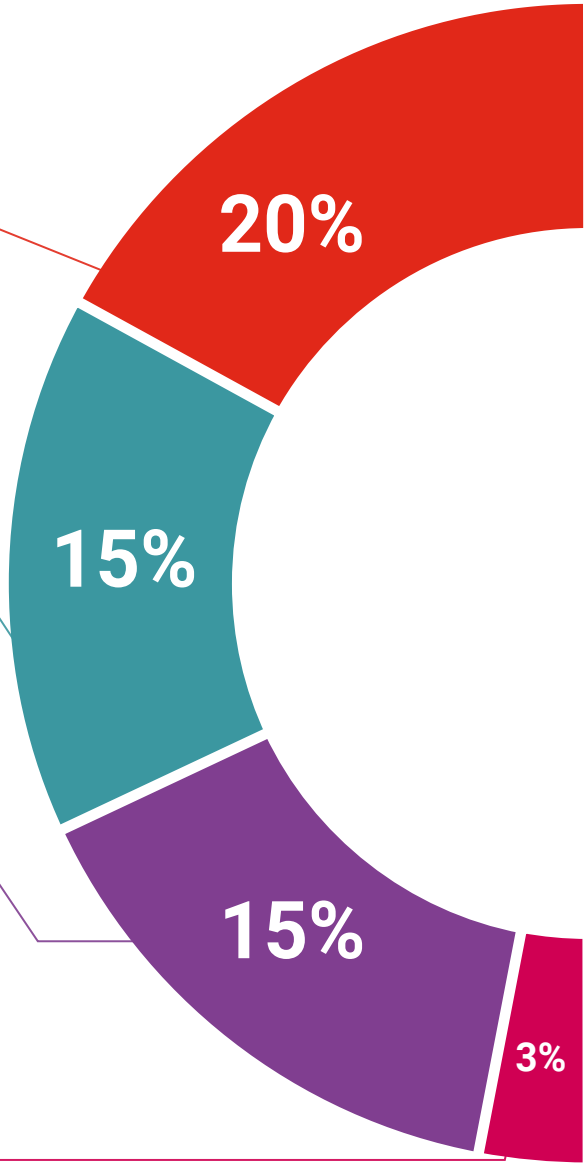
Interactive Summaries

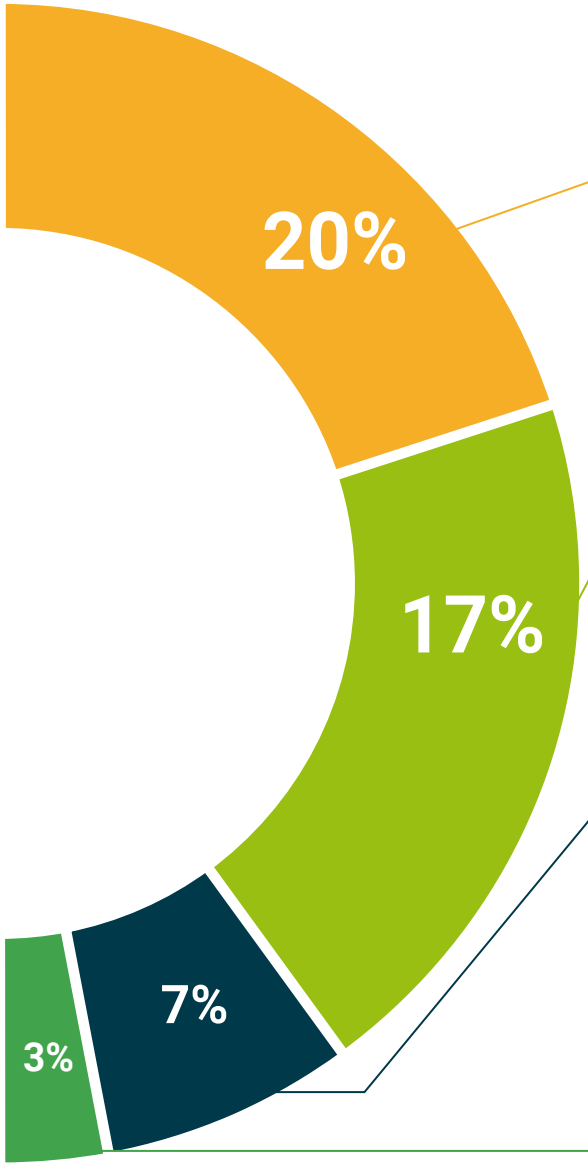
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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 Mathematics Teacher Training in High School Education guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma issued by TECH Technological University.

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

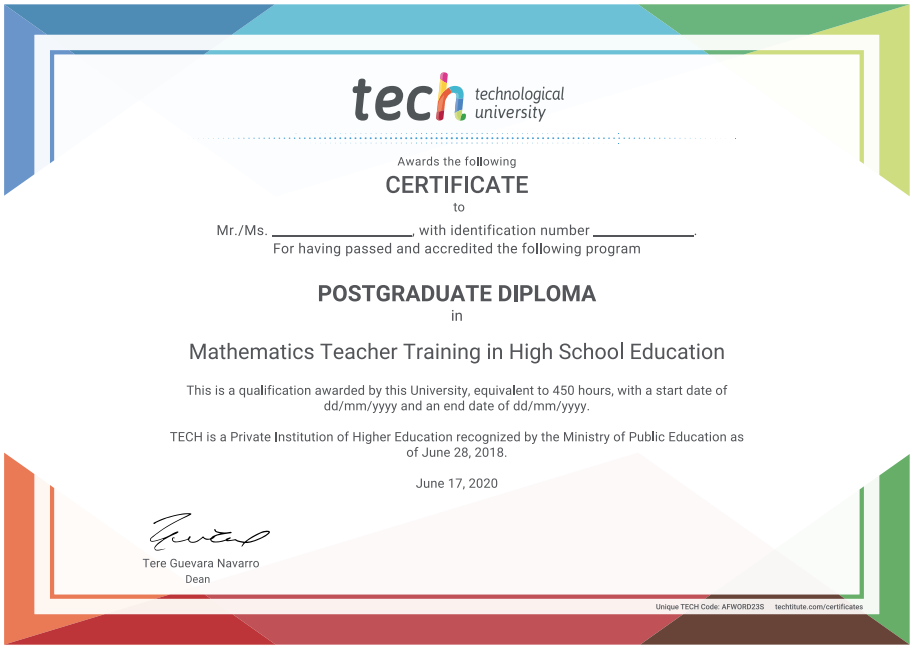
This **Postgraduate Diploma in Mathematics Teacher Training in High School Education** contains the most complete and up-to-date program on the market.

After the student has passed the assessments, they will receive their corresponding **Postgraduate Diploma** issued by **TECH Technological University** via tracked delivery*.

The certificate issued by **TECH Technological University** will reflect the qualification obtained in the Postgraduate Diploma, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Postgraduate Diploma in Mathematics Teacher Training in High School Education**

Official Nº of Hours: **450 h.**


tech technological university

Awards the following

CERTIFICATE

to

Mr./Ms. _____, with identification number _____.

For having passed and accredited the following program

POSTGRADUATE DIPLOMA

in

Mathematics Teacher Training in High School Education

This is a qualification awarded by this University, equivalent to 450 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018.

June 17, 2020

Tere Guevara Navarro
Dean

Unique TECH Code: AFWORD23S techtitute.com/certificates

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

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