

Postgraduate Diploma Pedagogical Innovation in Mathematics





Postgraduate Diploma Pedagogical Innovation in Mathematics

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

Website: www.techtute.com/in/education/postgraduate-diploma/postgraduate-diploma-pedagogical-innovation-mathematics

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01

Introduction

Technological development has revolutionized a number of today's sectors, leading to the emergence of new tools and services. The educational field has clearly benefited from these advances, implementing the use of increasingly innovative teaching methods to liven up classes and involve students in their education. Pedagogical strategies based on gamification and the use of ICT have been developed, particularly in Mathematics, which is the focus of this program. Thus, teachers will be able to update their teaching practice based on the most advanced and dynamic pedagogical techniques in a convenient 100% online format, giving them the option to study from wherever they want, without schedules or face-to-face classes.



“

The best program on the current academic market to learn about Pedagogical Innovation in Mathematics and update your practice"

The educational revolution that has taken place in recent years, supported by technological development, has enabled the design of new pedagogical strategies based on increasingly dynamic and effective techniques and tools, allowing teachers to develop participatory and entertaining classes to enhance cognitive processes through collaborative learning and the use of ICT. This type of academic approach contemplates the inclusion of games as the basis for teaching, as well as the use of methods such as Bloom's Taxonomy to hierarchize the processes of knowledge acquisition and ensure the achievement of academic objectives through the development of skills such as comprehension, critical thinking, analysis or memorization.

In view of this, TECH has developed a comprehensive program that brings together the latest and most exhaustive information related to this field in a convenient and flexible 100% online format, allowing teachers to update their practice based on the latest and most effective educational trends. This Postgraduate Diploma in Pedagogical Innovation in Mathematics, is a 600-hour academic experience, through which teachers can explore the implementation of gamification in classes and the use of ICT to capture students' attention. In addition, they will work intensively on the different mathematics learning landscapes, with special emphasis on the teaching methodologies that are currently yielding the best results, one example being the *Flipped Classroom*.

Thus, in only 6 months of multidisciplinary training, teachers will be able to enhance their professional skills, contributing to a significant improvement in learning based on innovation and the most effective pedagogical strategies. In addition to the syllabus, they will have dozens of hours of supplementary material of the highest quality, presented in different formats and available from the first day on the Virtual Campus. This will allow them to contextualize the information and delve deeper into the aspects they consider most important. It is, therefore, a unique opportunity to raise classes to the highest level, through an academic experience that will revolutionize mathematics teaching.

This **Postgraduate Diploma in Pedagogical Innovation in Mathematics** contains the most complete and up-to-date program on the market. The most important features include:

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



This Postgraduate Diploma will help you to incorporate the most innovative and sophisticated gamification techniques in classes, so that you can teach in an entertaining way"

“

Would you like to include ICT in your classes, but don't know where to start? This Postgraduate Diploma will enable you to do so effectively and in only 6 months of 100% online professional development"

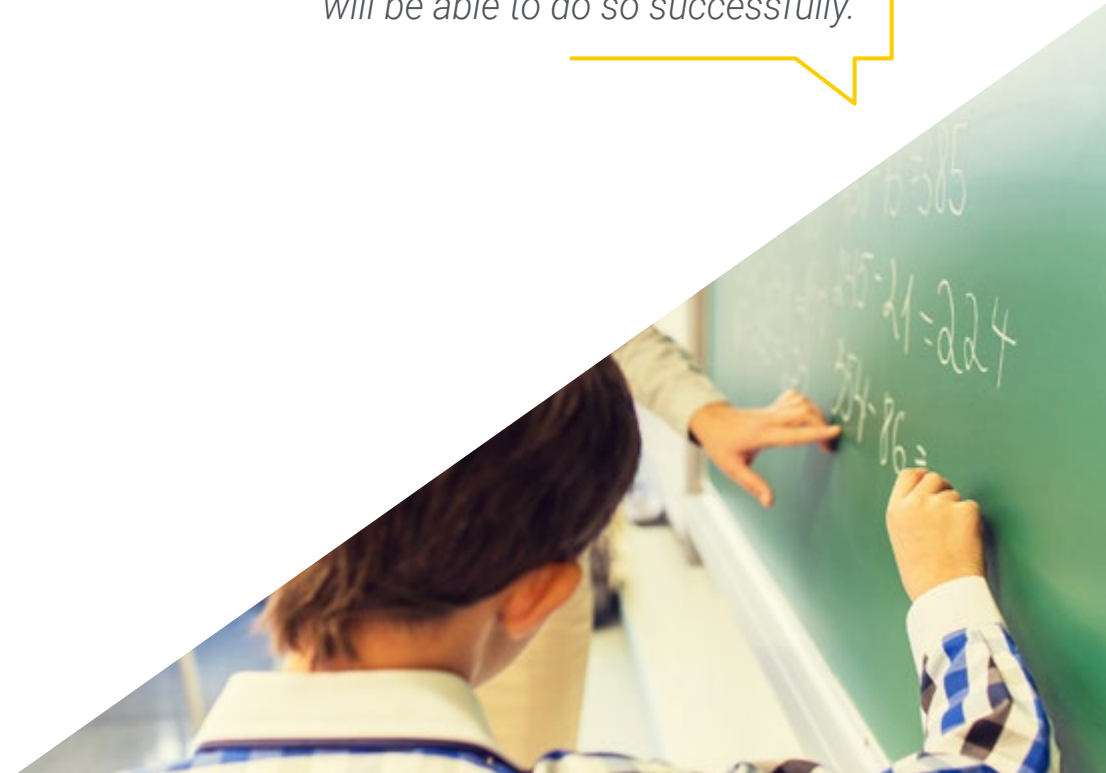
The teaching staff includes professionals from the sector who contribute their experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide professionals with situated and contextual learning, i.e., a simulated environment that will provide immersive education designed to prepare them for 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 student will be assisted by an innovative interactive video system created by renowned and experienced experts.

You will be able to explore Bloom's taxonomy applicable to Mathematics, allowing you to hierarchize cognitive processes at different levels and facilitate assessment.

Do you want to master the Flipped Classroom methodology to develop complex experiential activities in your classes? Thanks to this Postgraduate Diploma, you will be able to do so successfully.



02

Objectives

This Postgraduate Diploma has designed so that students can access the most cutting-edge theoretical, practical and supplementary content that will allow them gain expertise in Pedagogical Innovation in Mathematics and its diverse applications, in just 6 months. Thanks to the highly challenging syllabus, any professional will be able to achieve even their most ambitious goals through a Postgraduate Diploma tailored to their needs and presented in a convenient and accessible 100% online format.



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If your objectives include optimizing learning for different types of intelligence, this Postgraduate Diploma will explore how to achieve it in a dynamic and effective way"



General Objectives

- ♦ Know what adolescents and students in the classroom are like
- ♦ Gain an understanding of the current educational system, specifically in relation to mathematics
- ♦ Learn about the origins of games in humanity
- ♦ Be aware of the different ICT resources for Mathematics Portfolios/e-Portfolios



The course of this program will allow you to enhance your creative skills for the design of mathematics activities using the different existing learning landscapes"



Specific Objectives

Module 1. Learning Mathematics in Secondary School

- ♦ Discover the role of learning
- ♦ Be able to introduce mathematical language
- ♦ Understand the development of intelligence and mathematics
- ♦ Learn about the relationship between high abilities and giftedness and mathematics
- ♦ Explain the neural foundations of mathematics
- ♦ Identify the neural adjacent processes of mathematics
- ♦ Explore the emotional development of the adolescent
- ♦ Understand emotional intelligence applied to adolescents
- ♦ Examine adolescent mathematical development
- ♦ Learn about adolescent mathematical thinking
- ♦ Know what adolescents and students in the classroom are like
- ♦ Gain an understanding of the current educational system and its relationship with mathematics

Module 2. Gamification in Mathematics

- ♦ Understand the role of play in childhood
- ♦ Understand the role of play in adolescence
- ♦ Discern between the role of play in childhood and adolescence
- ♦ Learn what gamification in mathematics is
- ♦ Know about the advantages that gamification can bring to the mathematics learning process
- ♦ Learn the different elements of gamification applied to mathematics
- ♦ Know how to use gamification elements to transform a traditional mathematics activity into a gamified mathematics activity
- ♦ Learning to apply gamification to mathematics
- ♦ Know how to extrapolate an example of a gamified mathematical activity to any mathematics content
- ♦ Know how to design a gamified activity with content from the mathematics curriculum.
- ♦ Be aware of the different ICT resources related to the gamification of mathematics
- ♦ Learn about the origins of games in humanity
- ♦ Be aware of the different ICT resources for Mathematics Portfolios/e-Portfolios

Module 3. The Learning Landscape in Mathematics

- ♦ Be aware of the different ICT resources related to mathematical learning landscapes
- ♦ Learn about types of learning
- ♦ Explore the research group as a type of cooperative learning applied to mathematics
- ♦ Find out what mathematics learning landscapes are
- ♦ Study Bloom's taxonomy applied to mathematics
- ♦ Understand what the modified Bloom's taxonomy applied to mathematics is
- ♦ Learn about Howard Gardner's Multiple Intelligences applied to mathematics
- ♦ Know what linguistic intelligence is and its role in the mathematics learning system
- ♦ Know what logical-mathematical intelligence is and its role in the mathematics learning system
- ♦ Know what spatial intelligence is and its role in the mathematics learning system
- ♦ Know what musical intelligence is and its role in the mathematics learning system
- ♦ To know what bodily and kinesthetic intelligence is and its role in the mathematics learning system
- ♦ Know what intrapersonal intelligence is and its role in the mathematics learning system
- ♦ Know what interpersonal intelligence is and its role in the mathematics learning system
- ♦ Know what natural intelligence is and its role in the mathematics learning system
- ♦ Know what existential intelligence is and its role in the mathematics learning system
- ♦ Learning to design a mathematics learning landscape
- ♦ Learn to apply mathematical learning landscapes
- ♦ Oversee a mathematics activity using learning landscapes

Module 4. Other Innovative Methodologies in Mathematics

- ♦ Be aware of the different ICT resources for cooperative learning applied to mathematics
- ♦ Be aware of the different ICT resources for mathematics comprehension projects.
- ♦ Learn to use other alternative innovative mathematics methodologies
- ♦ Know what the *Flipped Classroom* is
- ♦ Know about the advantages of the *Flipped Classroom* applied to mathematics
- ♦ Know about the disadvantages of the *Flipped Classroom* applied to mathematics
- ♦ Learn how to apply the *Flipped Classroom* to mathematics
- ♦ Learn to apply digital murals to mathematics
- ♦ Know how to design a mathematics teaching unit

03

Course Management

Not all universities offer programs that are supported by teaching teams who are experts in the area under study. However, TECH does. In addition, this university submits candidates to an exhaustive and demanding selection process, resulting in the formation of the best faculty, made up of experts with broad and extensive professional experience in the sector, as is the case with this Postgraduate Diploma.



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The teaching team has selected real situations taken from their own classes so that you can effectively put your skills into practice based on different student profiles"

Management



Mr. Jurado Blanco, Juan

- ♦ Mathematics Teacher
- ♦ Mathematics teacher in Compulsory Secondary Education at Santa Teresa de Jesús School in Vilanova i la Geltrú.
- ♦ Industrial Technical Engineer, specializing in Industrial Electronics
- ♦ Expert in High Abilities

Professors

Mr. De la Serna, Juan Moisés

- ♦ Psychologist
- ♦ Psychologist specializing in Neurosciences and Behavioral Biology
- ♦ Director of the Open Chair of Psychology and Neurosciences and science communicator
- ♦ Occupational Trainer
- ♦ Doctor in Psychology, Master's Degree in Neurosciences and Behavioral Biology
- ♦ Master's Degree in Neurosciences and Behavioral Biology
- ♦ University Specialist in Clinical Hypnosis
- ♦ Expert in Project Management
- ♦ Postgraduate Diploma in Teaching Methodology

Dr. Sánchez García, Manuel

- ♦ Mathematics Teacher
- ♦ Mathematics teacher in Compulsory Secondary Education at Santa Teresa de Jesús School in Vilanova i la Geltrú
- ♦ Vocational Training and Language Teaching
- ♦ Degree in Biology
- ♦ Specializing in Health Biology
- ♦ Master's Degree in Teacher Training for Compulsory Secondary and High School Education



04

Structure and Content

The quality and prestige that define TECH and place it as one of the best digital universities worldwide has been the result of years of effort and struggle to shape the best 100% online degrees. In each of them, there is a team versed in the field, which is responsible for selecting not only the theoretical information that makes up the syllabus, but also use cases based on real situations and hours of high-quality supplementary material. Thanks to this, it is possible to offer highly empowering academic experiences condensed in a convenient and flexible format that facilitates student learning from any place, without schedules and through any device with an Internet connection.



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The flexibility of the Virtual Campus and its optimization for any device will allow you to access it from wherever you want and through your mobile, tablet or PC"

Module 1. Learning Mathematics in Secondary School

- 1.1. Defining Learning
 - 1.1.1. The Role of Learning
 - 1.1.2. Types of Learning
- 1.2. Learning Mathematics
 - 1.2.1. Differential Learning of Mathematics
 - 1.2.2. Features of Mathematics
- 1.3. Cognitive and Metacognitive Processes in Mathematics
 - 1.3.1. Cognitive Processes in Mathematics
 - 1.3.2. Metacognitive Processes in Mathematics
- 1.4. Attention and Mathematics
 - 1.4.1. Focused Attention and Mathematics Learning
 - 1.4.2. Sustained Attention and Mathematics Learning
- 1.5. Memory and Mathematics
 - 1.5.1. Short-Term Memory and Mathematics Learning
 - 1.5.2. Long-Term Memory and Mathematics Learning
- 1.6. Language and Mathematics
 - 1.6.1. Language Development and Mathematics
 - 1.6.2. Mathematical Language
- 1.7. Intelligence and Mathematics
 - 1.7.1. Development of Intelligence and Mathematics
 - 1.7.2. Relationship between High Abilities, Giftedness with Mathematics
- 1.8. Neural Bases of Mathematics Learning
 - 1.8.1. Neural Foundations of Mathematics
 - 1.8.2. Adjacent Neural Processes of Mathematics
- 1.9. Characteristics of Secondary School Students
 - 1.9.1. Adolescent Emotional Development
 - 1.9.2. Emotional Intelligence Applied to Adolescents
- 1.10. Adolescence and Mathematics
 - 1.10.1. Adolescent Mathematical Development
 - 1.10.2. Adolescent Mathematical Thinking

$$2x^2 + 9x + 10$$

$$10x^2 +$$





Module 2. Gamification in Mathematics

- 2.1. Play
 - 2.1.1. Play
 - 2.1.2. Play Since the Middle Ages
- 2.2. Games in Childhood
 - 2.2.1. Areas Developed by Games
- 2.3. Games in Adolescence
 - 2.3.1. Introduction
 - 2.3.1.1. Elements which make Games so Important for Adolescents
 - 2.3.1.2. Adolescents and Video Games
 - 2.3.1.3. Better Hand-Eye Coordination
 - 2.3.1.4. Faster Thinking, Sharper Memory
 - 2.3.1.5. Greater Creativity
 - 2.3.1.6. Promote Learning
 - 2.3.2. The Video Game as an Educational Tool
 - 2.3.2.1. When to Act When is Video Gaming Detrimental?
- 2.4. Gamification
 - 2.4.1. Motivation and "Continuous Feedback"
 - 2.4.1.1. Personalized Education
 - 2.4.2. Societal Change
 - 2.4.3. Elements of Gamification
- 2.5. Gamification of Mathematics
 - 2.5.1. Representation of all Types of Functions
 - 2.5.2. Solving 1st and 2nd Degree Equations
 - 2.5.3. Solving Systems of Equations
- 2.6. Application of Gamification in Mathematics (Part I)
 - 2.6.1. How Gamification Works
 - 2.6.2. Gamification Model
 - 2.6.3. Purpose of Gamification
 - 2.6.4. Padlocks
 - 2.6.5. Analysis of Gamification Elements
- 2.7. Application of Gamification in Mathematics (Part II)
 - 2.7.1. Introduction to Augmented Reality
 - 2.7.2. Creating Auras
 - 2.7.3. Mobile Configuration

Module 3. The Mathematics Learning Landscape

- 3.1. What are Learning Landscapes Applied to Mathematics?
 - 3.1.1. The Horizontal Axis of the Learning Landscape Matrix: Bloom's Taxonomy
 - 3.1.2. The Vertical Axis of the Learning Landscape Matrix: Multiple Intelligences
 - 3.1.3. The Learning Landscape Matrix
 - 3.1.4. Supplements to the Learning Landscape
 - 3.1.5. Example of a Learning Landscape
- 3.2. Bloom's Taxonomy applied to Mathematics
 - 3.2.1. Bloom's Taxonomy of Thinking Skills (1956) and Mathematics
 - 3.2.2. Review of Bloom's Taxonomy (Anderson and Krathwohl, 2001) and Mathematics.
 - 3.2.3. Bloom's Taxonomy for the Digital Age (Churches, 2008) and Mathematics
- 3.3. Multiple Intelligences applied to Mathematics
 - 3.3.1. Linguistic Intelligence applied to Mathematics
 - 3.3.2. Logical-Mathematical Intelligence applied to Mathematics
 - 3.3.3. Spatial Intelligence applied to Mathematics
 - 3.3.4. Musical Intelligence applied to Mathematics
 - 3.3.5. Body and Kinesthetic Intelligence applied to Mathematics
 - 3.3.6. Intrapersonal Intelligence applied to Mathematics
 - 3.3.7. Interpersonal Intelligence applied to Mathematics
 - 3.3.8. Natural Intelligence applied to Mathematics
 - 3.3.9. Existential Intelligence applied to Mathematics
- 3.4. Designing a Learning Landscape in Mathematics
 - 3.4.1. Context of the Curricular Content to be Worked On
 - 3.4.2. Gamification
 - 3.4.2.1. Game Elements
 - 3.4.2.2. Narrative



- 3.4.3. Design of Activities
 - 3.4.3.1. Bloom Double-Entry Intelligences Matrix
 - 3.4.3.2. Determination of Itineraries
 - 3.4.3.3. Designing Activities for Each Itinerary
 - 3.4.3.4. Assessment
 - 3.4.3.5. Design of the Genially Graphical Environment
- 3.5. Example of a Learning Landscape Applied to Mathematics
 - 3.5.1. Context of the Curricular Content to be Worked On
 - 3.5.2. Gamification
 - 3.5.2.1. Narrative
 - 3.5.2.2. Game Elements
 - 3.5.3. Design of Activities
 - 3.5.3.1. Bloom Double-Entry Intelligences Matrix
 - 3.5.3.2. Designing Activities for Each Itinerary
 - 3.5.3.3. Assessment
 - 3.5.3.4. Design of the Graphical Environment -Final Result

Module 4. Other Innovative Methodologies in Mathematics

- 4.1. *Flipped Classroom* applied to Mathematics
 - 4.1.1. The Traditional Class
 - 4.1.2. What Is the *Flipped Classroom*?
 - 4.1.3. Advantages of the *Flipped Classroom* applied to Mathematics
 - 4.1.4. Disadvantages of the *Flipped Classroom* applied to Mathematics
 - 4.1.5. Example of a *Flipped Classroom* applied to Mathematics
- 4.2. Peer Mentoring in Mathematics
 - 4.2.1. Definition of Mentoring
 - 4.2.2. What is Peer Mentoring?
 - 4.2.3. Advantages of Peer Mentoring in Mathematics
 - 4.2.4. Disadvantages of Peer Mentoring in Mathematics
 - 4.2.5. Example of Peer Mentoring Applied to Mathematics.

- 4.3. Conceptual Jigsaw Puzzles applied to Mathematics
 - 4.3.1. Definition of Jigsaw Puzzles
 - 4.3.2. What is a Conceptual Jigsaw Puzzle?
 - 4.3.3. Advantages of Conceptual Jigsaw Puzzles in Mathematics
 - 4.3.4. Disadvantages of Conceptual Jigsaw Puzzles in Mathematics
 - 4.3.5. Example of Conceptual Jigsaw Puzzle Applied to Mathematics.
- 4.4. Digital Murals applied to Mathematics
 - 4.4.1. Definition of a Mural
 - 4.4.2. Digital Murals in Mathematics
 - 4.4.3. Tools for Making Digital Murals in Mathematics
 - 4.4.4. Advantages of Digital Murals in Mathematics
 - 4.4.5. Disadvantages of Digital Murals in Mathematics
 - 4.4.6. An Example of a Digital Mural applied to Mathematics



If you want to revolutionize teaching and become a leading mathematics teacher, opt for this Postgraduate Diploma and start working towards excellence in the projects you propose"

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

TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

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 adapted in 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, students can watch them as many times as they want.



Interactive Summaries

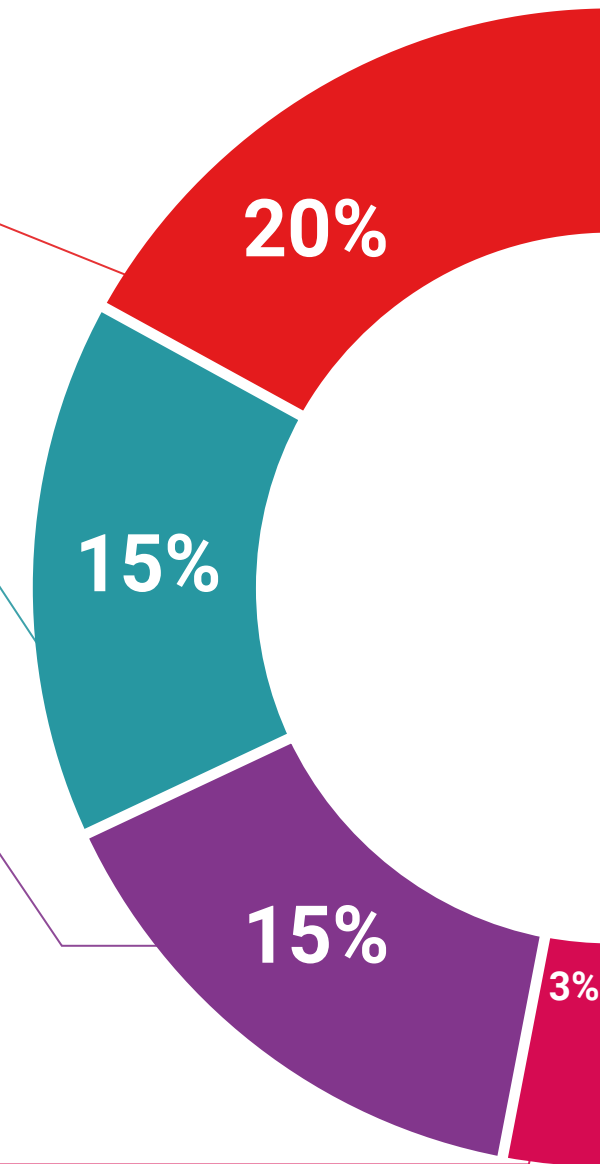
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

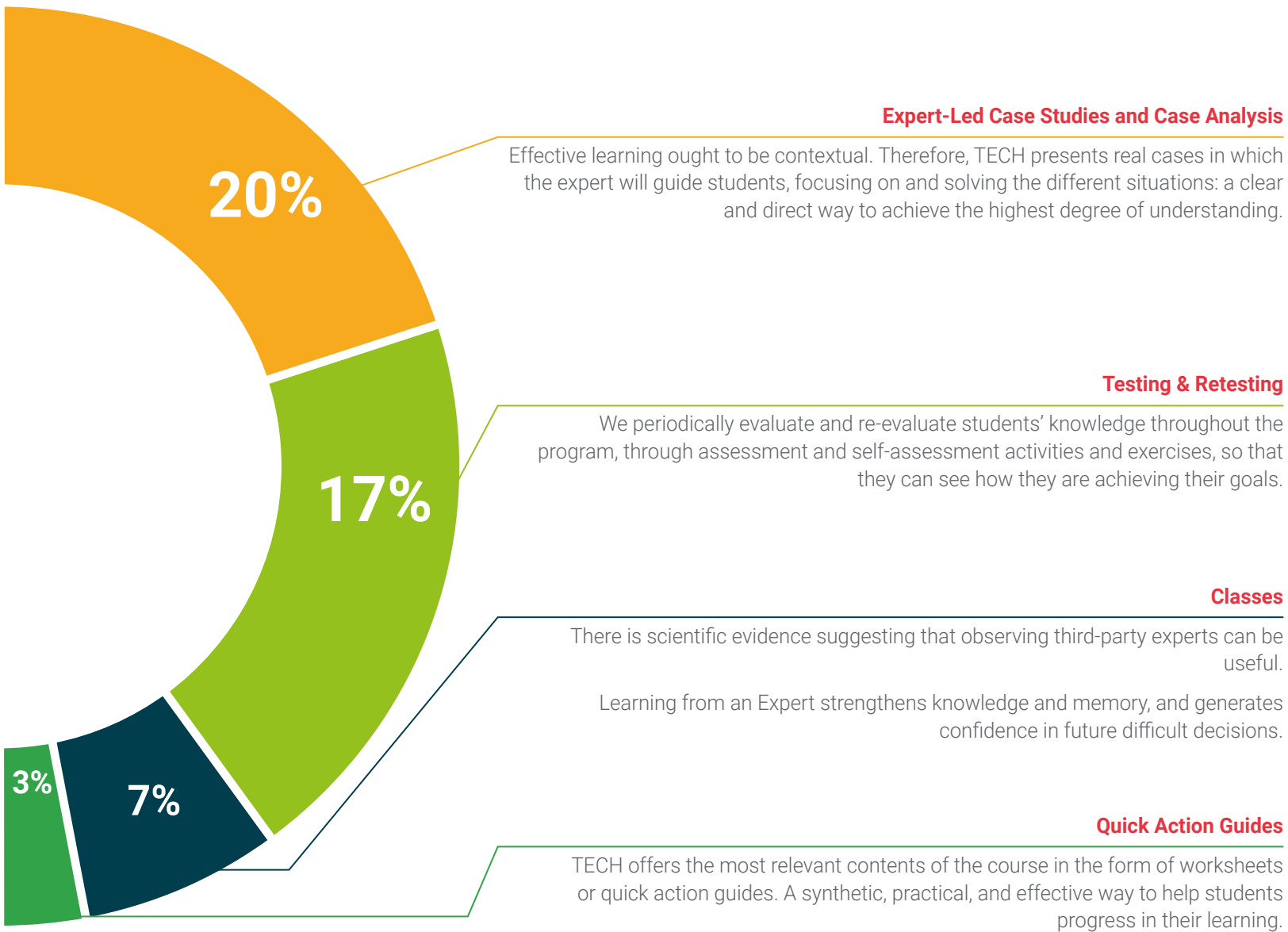
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



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.





06

Certificate

This Postgraduate Diploma in Pedagogical Innovation in Mathematics guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma issued by TECH Technological University.



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

This **Postgraduate Diploma in Pedagogical Innovation in Mathematics** contains the most complete and up-to-date program 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 Pedagogical Innovation in Mathematics**

Official N° of Hours: **600 h.**



*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.

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

tech technological university

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

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