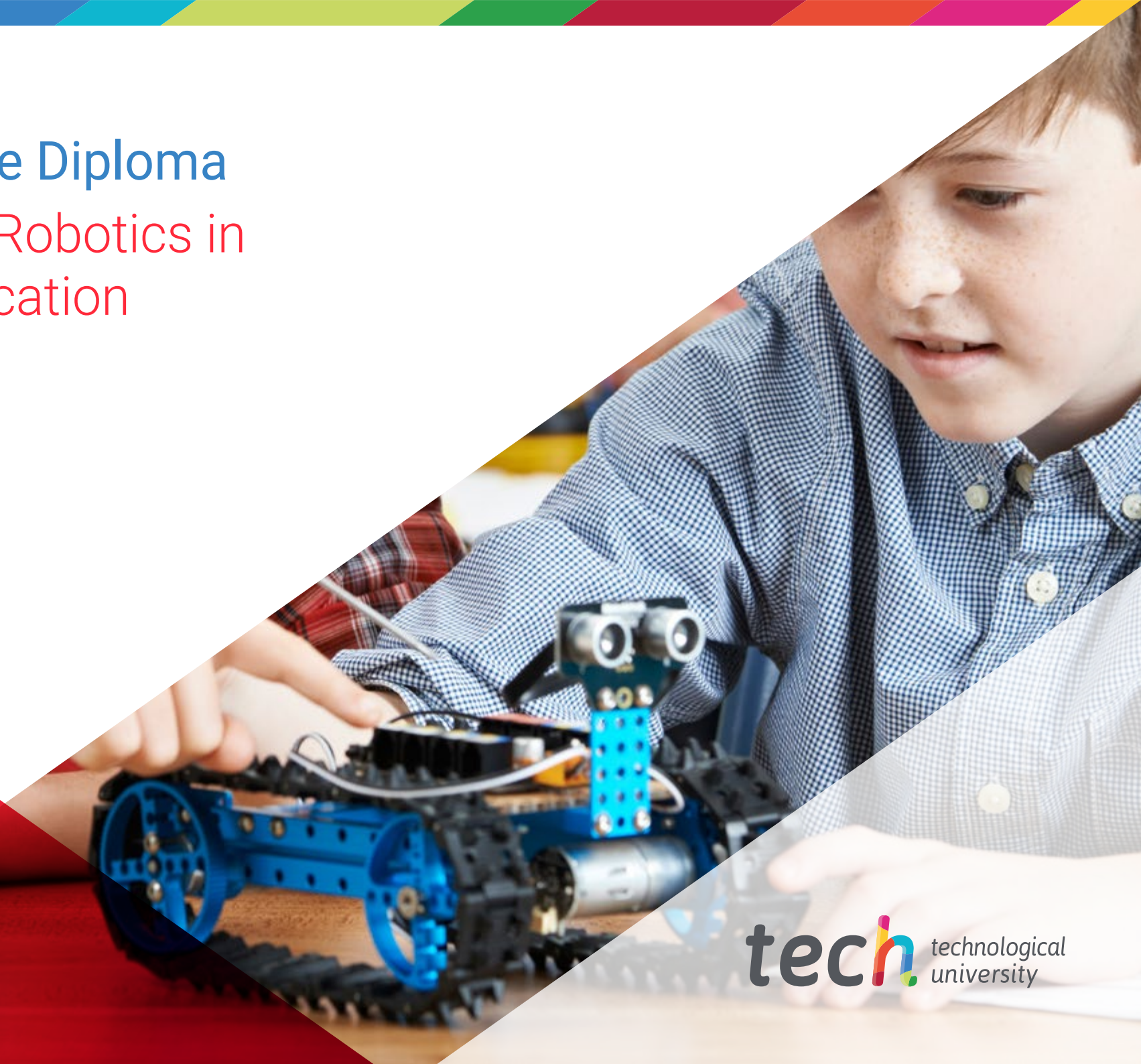


# Postgraduate Diploma Educational Robotics in Primary Education





## Postgraduate Diploma Educational Robotics in Primary Education

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

Website: [www.techtitute.com/us/education/postgraduate-diploma/postgraduate-diploma-educational-robotics-primary-education](http://www.techtitute.com/us/education/postgraduate-diploma/postgraduate-diploma-educational-robotics-primary-education)

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# 01

# Introduction

The development of logical thinking, digital and manual skills and special orientation are just some of the advantages obtained by the primary school student who attends an apprenticeship in which Robotics is present. The teaching practice through this technique allows them to work on their cognitive growth through trial and error, making them more autonomous and perfecting their skills in teamwork and cooperation. And if the teacher also wants to enhance these skills in their students through a playful, dynamic and highly empowering teaching, they can count on this program that, precisely, gathers the most innovative information to carry it out. Therefore, through a multidisciplinary and online academic experience, you will have the opportunity to learn in detail the fundamentals of Robotics applicable to the school environment for children between 6 and 13 years old.





“

*A 100% online program that will allow you to acquire the most specialized knowledge about Robotics applied to the educational field in the primary school in only 6 months"*

Robotics for children is an increasingly common practice in the academic environment of primary education thanks to the multiple cognitive benefits that are developed through experimentation and play. It is a teaching strategy that enhances attention, spatial orientation, teamwork, creativity, cooperation, logical thinking, autonomous work and, above all, interest in technology and science. For this reason, more and more educational centers decide to implement in their school curricula digital tools related to this sector, giving their students the opportunity to learn and grow while having fun.

And so this Postgraduate Diploma in Educational Robotics in Primary Education arises as a response to the growing demand in the market for programs that focus specifically on this field and on creative and innovative learning. For this purpose, TECH and its team versed in Primary Education has selected 425 hours of the best information related to the technological fundamentals of computer science and programming adapted to teaching for ages 6 to 13. Therefore, the graduate will be able to delve into the different models of education to promote the cognitive development of children through the best and most entertaining methodologies. In addition, they will work intensively on the different tools that currently exist to work with robotics in the classroom: LEGO®, WeDo 2.0, mBot, etc.

And to pass the criteria that will grant you the category of expert, you will have 6 months of a 100% online program, with no on-site classes or restricted schedules, since all the material will be hosted in a state-of-the-art Virtual Campus. You will be able to design the teaching calendar according to your own availability. It is, therefore, a unique opportunity to update your teaching practice based on the most innovative fundamentals of Primary Robotics, thanks to which, your students will raise their talents to the highest level while learning as well as having fun.

This **Postgraduate Diploma in Educational Robotics in Primary Education** contains the most complete and up-to-date program on the market. Its most notable features are:

- ♦ Case studies presented by experts in Education and Innovation
- ♦ The graphic, schematic, and practical contents with which they are created, provide techniques and 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



*Would you like to expand your catalog of DIY activities for technological practice in the classroom? Because this Postgraduate Diploma includes a specific module dedicated to this field"*



“

*Thanks to this Postgraduate Diploma you will be able to adapt the different robotic projects to the requirements and demands of the school curriculum of the program in which you teach"*

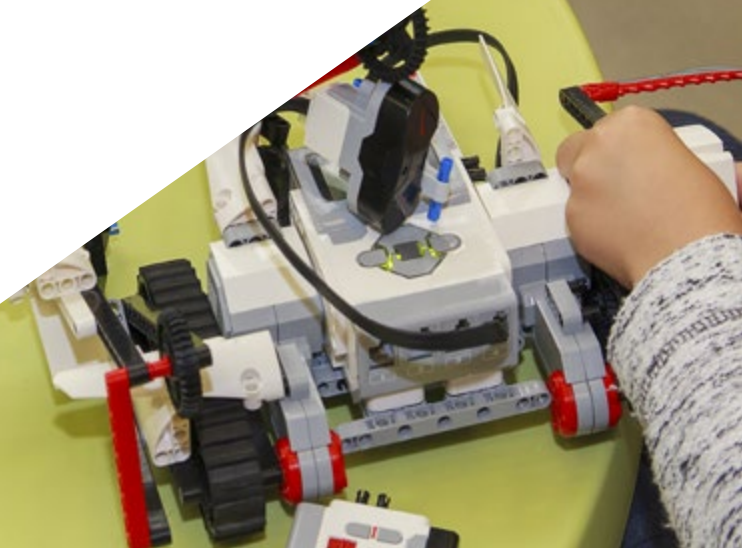
The program's teaching staff includes professionals from the sector who contribute their work experience to this program, as well as renowned specialists from leading societies and prestigious universities.

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 knowledge 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 throughout the program. For this purpose, the student will be assisted by an innovative interactive video system created by renowned and experienced experts.

*You will master the mBot and the construction of "my first robot", being able to implement it in your classes and allowing your students to experiment with computer science in an autonomous and playful way.*

*The program also includes a specific section dedicated to the LEGO® world, so that you can learn about the different tools available to the Danish company for educational practice.*



# 02

# Objectives

Teaching based on the knowledge and use of Robotics in the field of Primary Education is an increasingly widespread practice in today's academic environment. Therefore, the objective of this Postgraduate Diploma is to provide teachers with the keys to master the technological and teaching strategies that allow them to implement teaching based on autonomous work with robots in the classroom. With a 100% online program, you will be able to transform your classes based on the guidelines of the educational vanguard in only 6 months.







“

*TECH designs each of its programs with the objective that its students will reach and surpass their own expectations sooner than they expect thanks to the high level of its theoretical, practical and additional content”*



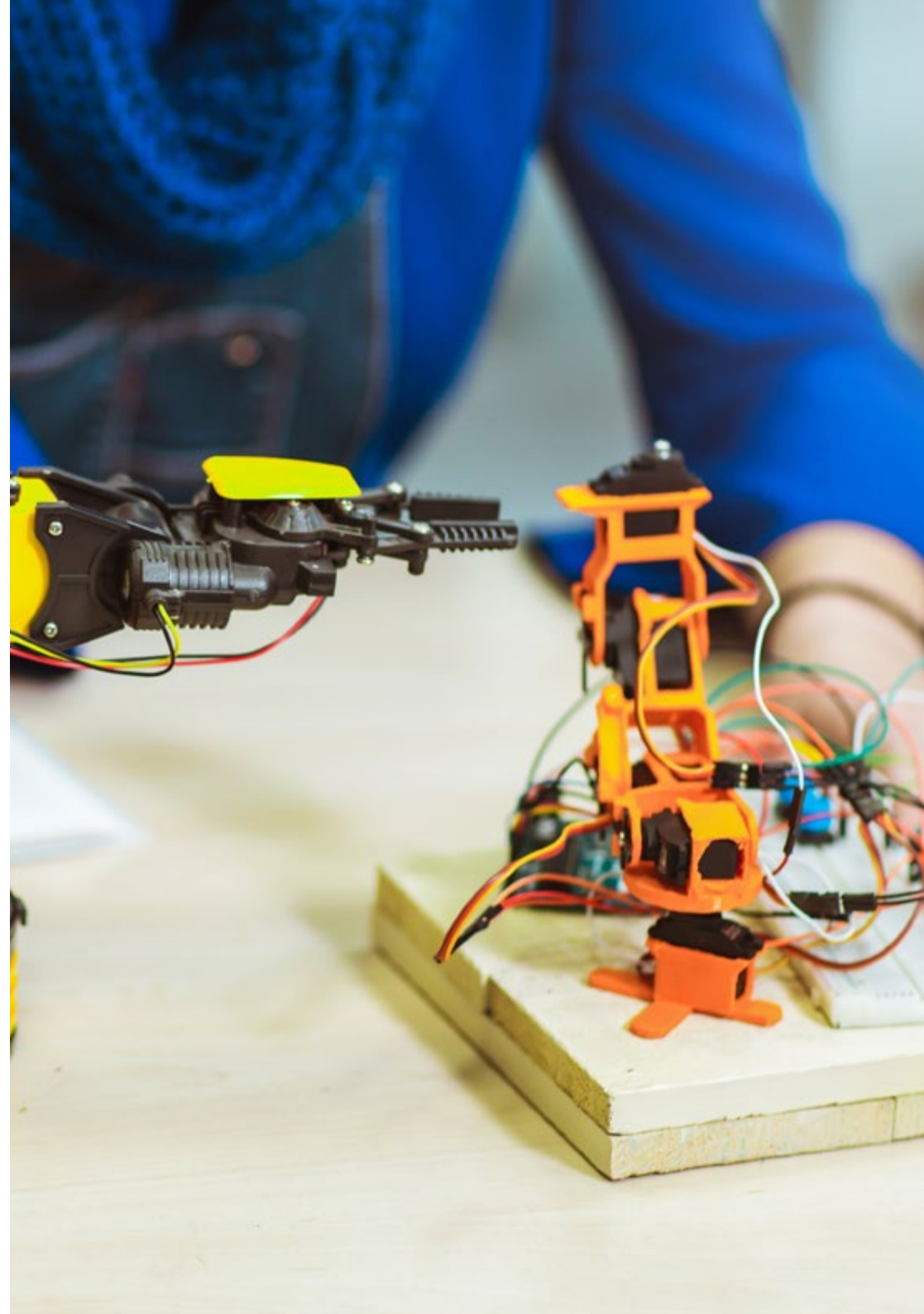
## General Objectives

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- ♦ Prepare Primary Education teachers to use materials and methodologies that improve motivation, creativity and innovation through Educational Robotics
- ♦ Learn how to plan in a transversal and curricular way in the primary education stage where education professionals can incorporate new technologies and methodologies in the classroom
- ♦ Learn about new learning models and the application of educational robotics to motivate students towards technological careers

“

*If your objectives include mastering the analytical tools of knowledge, look no further because this Postgraduate Diploma is perfect for you"*





## Specific Objectives

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### Module 1. Fundamentals and Evolution of Applied Technology in Education

- ♦ Raise teachers' awareness of new educational trends and the direction of their role in education
- ♦ Provide knowledge of new information and communication technology skills
- ♦ Train teachers to promote educational change within the classroom to create environments that improve student achievement
- ♦ Introduce learning theories related to Educational Robotics
- ♦ Understand the laws of robotics

### Module 2. Educational Robotics Robots in the Classroom

- ♦ Substantiate the application of robotics pedagogy in the classroom.
- ♦ Know the legal and ethical aspects of robotics and 3D printing
- ♦ Teaching STEAM skills as a learning model
- ♦ Transfer the teacher to new physical environments that improve the educational practice
- ♦ Knowledge of computational thinking skills
- ♦ Know the aspects of robotics, educational robotics
- ♦ Learning the impact between Emotional Intelligence and Educational Robotics
- ♦ Explain the introduction of Robotics in early childhood education

### Module 3. I'm a Grown-up Now! Knowledge of Educational Robotics in the Primary School Stage

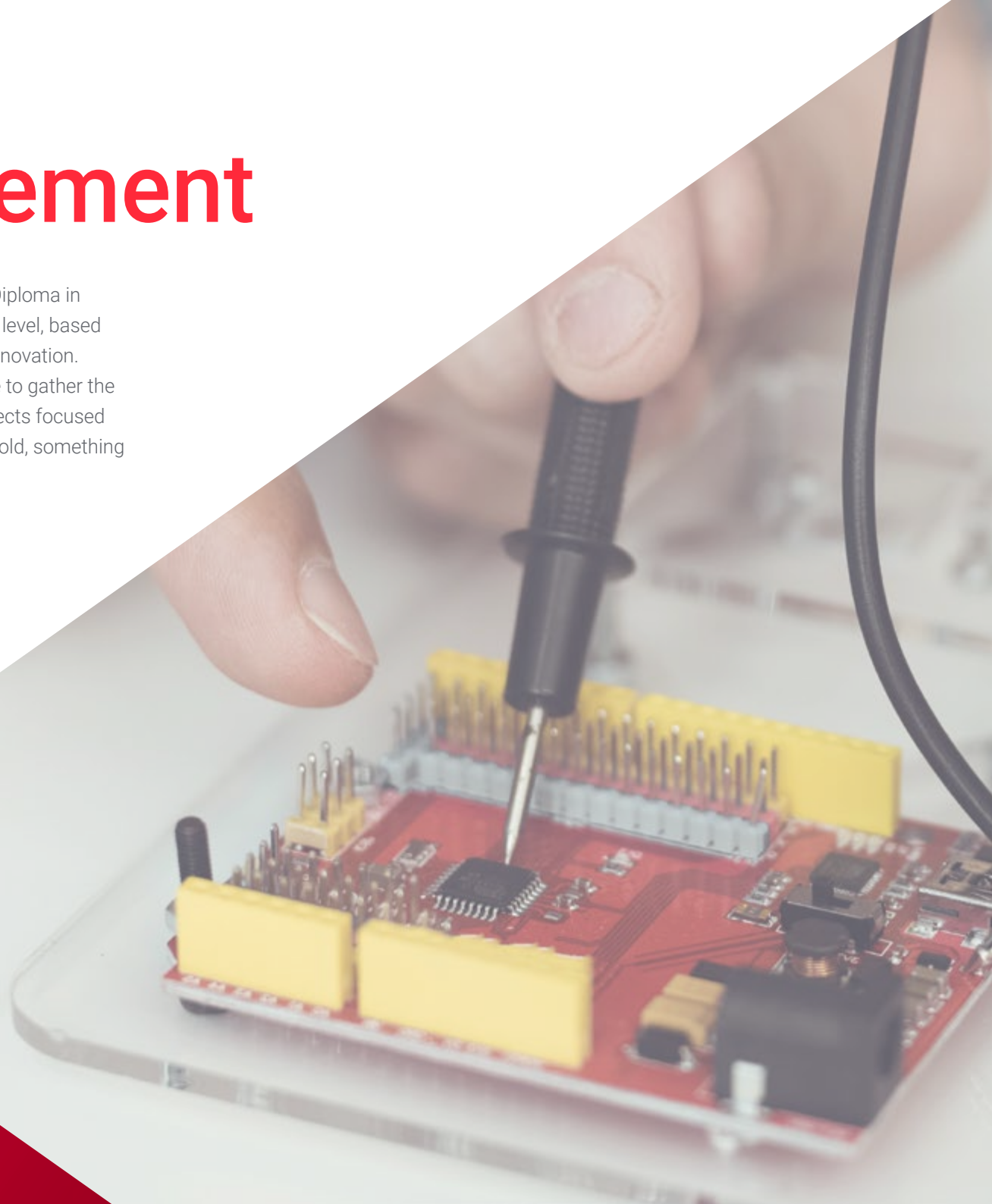
- ♦ Learn Do it Yourself techniques, to develop students' creativity
- ♦ Support the different pedagogical applications in educational intervention.
- ♦ Know the fundamentals of computational thinking and use it as a problem-solving skill
- ♦ Analyze algorithmic thinking
- ♦ Assess the evolution of new technologies in the first cycles



# 03

# Course Management

The teaching support that the graduate who enrolls in the Postgraduate Diploma in Educational Robotics in Primary Education will have will be of the highest level, based on the presence of professionals versed in Technological Teaching and Innovation. Thanks to their vast experience in the academic field, it has been possible to gather the most comprehensive and effective information to develop academic projects focused on the successful use of Robotics with students between 6 and 13 years old, something they will undoubtedly share with the graduates of this program.



“

*The teaching team will be at your disposal to answer any questions you may have during the course of the program using the direct communication tool of the Virtual Campus”*

## Management



### Ms. Muñoz Gambín, Marina

- ♦ Teacher and Expert in Educational Technology
- ♦ Head of Educational Robotics and Programming at Robotuxc Academy for Kindergarten and Primary School.
- ♦ Certified in Lego Education© methodology
- ♦ Degree in Early Childhood Education Teaching from CEU Cardenal Herrera University.
- ♦ Educational Coach certified by the Alicante Chamber of Commerce.
- ♦ Emotional Intelligence in the Classroom Trainer
- ♦ Neuroscience Teacher Training
- ♦ Expert in Neurolinguistic Programming certified by Richard Bandler.
- ♦ Certified in Music Education as therapy

## Professors

### Ms. Gambín Pallarés, María del Carmen

- ♦ Social Worker and Family Therapist
- ♦ Systemic Family Therapist
- ♦ Social Worker
- ♦ Founder and director of "Educa Diferente" Positive Discipline Alicante.
- ♦ Family and teacher educator in Positive Discipline
- ♦ Lego Serious Play methodology facilitator
- ♦ Coaching training for professionals

### Mr. Coccaro Quereda, Alejandro

- ♦ Specialist in Educational Robotics
- ♦ Expert in Educational Robotics, Design and 3D Printing
- ♦ Robotuxc Academy Robotics National Competition Challenges Specialist
- ♦ Certified in Lego Education© methodology
- ♦ Head of Educational Robotics, Design and 3D Printing for Primary and
- ♦ High School at Robotuxc Academy





# 04

## Structure and Content

Developing this Postgraduate Diploma has been a real challenge for TECH and its team, who, despite being experts in education and innovation, have had to carry out an exhaustive research task in order to create a complete, comprehensive, up-to-date program adapted to the pedagogical criteria that define and differentiate this university. In addition, with an emphasis on the multidisciplinary factor that characterizes all the qualifications of this center, they have also included in their content hours of additional material in audiovisual format, research articles, dynamic summaries and complementary readings so that the graduate can take full advantage of this academic experience and delve into the most relevant aspects of the syllabus for their professional performance.







“

*You will have dozens of hours of additional material to expand each section according to your needs”*



## Module 1. Fundamentals and Evolution of Applied Technology in Education

- 1.1. Aligning with HORIZON 2020
  - 1.1.1. Early Advances in ICT and Teacher Participation
  - 1.1.2. Horizon 2020 European Plan Progress
  - 1.1.3. UNESCO: ICT Skills for Teachers
  - 1.1.4. The Teacher as a Coach
- 1.2. Pedagogical Foundations of Educational Robotics
  - 1.2.1. MIT - a Pioneering Center of Innovation
  - 1.2.2. Jean Piaget - Forerunner of Constructivism
  - 1.2.3. Seymour Papert - Transformer of Technology Education
  - 1.2.4. George Siemens' Connectivism
- 1.3. Regularization of a Technological-legal Environment
  - 1.3.1. Ethical Agreement on Applied Robotics European Report
- 1.4. Importance of the Curricular Implementation of Robotics and Technology
  - 1.4.1. Educational Skills
    - 1.4.1.1. What Is a Skill?
    - 1.4.1.2. What Is an Educational Skill?
    - 1.4.1.3. Core Skills in Education
    - 1.4.1.4. Application of Educational Robotics to Educational Skills
  - 1.4.2. STEAM. New learning Approach: Innovative Education to Train Future Professionals
  - 1.4.3. Technological Classroom Designs
  - 1.4.4. Creativity and Innovation Included in the Curricular Model.
  - 1.4.5. The Classroom as a MAKERSPACE
  - 1.4.6. Critical Thinking

- 1.5. Another Way of Teaching
  - 1.5.1. Why Should we Innovate in Education?
  - 1.5.2. Neuroeducation; Emotion as Success in Education
    - 1.5.2.1. Some Neuroscience to Understand How do we Produce Learning in Children?
  - 1.5.3. The 10 Keys to Gamify your Classroom
  - 1.5.4. Educational Robotics: The Flagship Methodology of the Digital Age
  - 1.5.5. Advantages of Robotics in Education
  - 1.5.6. Design with 3D Printing and its Impact on Education
  - 1.5.7. Flipped Classroom and Flipped Learning
- 1.6. Gardner and Multiple Intelligences
  - 1.6.1. The 8 Types of Intelligence
    - 1.6.1.1. Logical-Mathematical Intelligence
    - 1.6.1.2. Linguistic Intelligence
    - 1.6.1.3. Spatial Intelligence
    - 1.6.1.4. Musical Intelligence
    - 1.6.1.5. Body and Kinesthetic Intelligence
    - 1.6.1.6. Intrapersonal Intelligence
    - 1.6.1.7. Interpersonal Intelligence
    - 1.6.1.8. Naturalistic Intelligence
  - 1.6.2. The 6 Keys to Apply the Different Intelligences
- 1.7. Knowledge Analytical Tools
  - 1.7.1. Applying BIG DATA in Education

## Module 2. Educational Robotics; Robots in the Classroom

- 2.1. Beginnings of Robotics
- 2.2. Robo... What?
  - 2.2.1. What Is a Robot? What Isn't a Robot?
  - 2.2.2. Robot Types and Classification
  - 2.2.3. Components of a Robot
  - 2.2.4. Asimov and the Laws of Robotics
  - 2.2.5. Robotics, Educational Robotics and Pedagogic Robotics
  - 2.2.6. DIY (*Do It Yourself*) Techniques

- 2.3. Educational Robotics Learning Systems
    - 2.3.1. Meaningful and Active Learning
    - 2.3.2. Project-Based Learning (PBL)
    - 2.3.3. Play Based Learning
    - 2.3.4. Learning to Learn and Problem Solving
  - 2.4. Computational Thinking (CT) Comes to the Classrooms
    - 2.4.1. Nature
    - 2.4.2. The PC Concept
    - 2.4.3. Computational Thinking Techniques
    - 2.4.4. Algorithmic Thinking and Pseudocode
    - 2.4.5. Computational Thinking Tools
  - 2.5. Educational Robotics Work Formula
  - 2.6. Four C methodology to Boost Your Students
  - 2.7. General Educational Robotics Advantages
- Module 3. I'm a Grown-up Now! Knowledge of Educational Robotics in the Primary School Stage**
- 3.1. Learning Robotics, Building Apprenticeships
    - 3.1.1. Pedagogical Approach in Elementary Classrooms
    - 3.1.2. Importance of Collaborative Work
    - 3.1.3. *Enjoying by Doing* Method
    - 3.1.4. From ICTs (New Technologies) to LKT (Learning and Knowledge Technology)
    - 3.1.5. Correlating Robotics and Curricular Contents
  - 3.2. We Become Engineers!
    - 3.2.1. Robotics as an Educational Resource
    - 3.2.2. Robotic Resources to Introduce in the Primary School Stage
  - 3.3. About LEGO®
    - 3.3.1. LEGO WeDo 9580 Kit
      - 3.3.1.1. Kit Contents
      - 3.3.1.2. LEGO 9580 Software
    - 3.3.2. LEGO WeDo 2.0 Kit
      - 3.3.2.1. Kit Contents
      - 3.3.2.2. WeDo 2.0 Software
  - 3.3.3. First Notions in Mechanics
    - 3.3.3.1. Scientific and Technological Principles of Levers
    - 3.3.3.2. Scientific and Technological Principles of Wheels and Axles
    - 3.3.3.3. Scientific and Technological Gear Principles
    - 3.3.3.4. Scientific and Technological Pulley Principles
  - 3.4. Teaching Practice: Building my First Robot
    - 3.4.1. Introduction to mBot, Getting Started
    - 3.4.2. Robot Movement
    - 3.4.3. IR Sensor (Light Sensor)
    - 3.4.4. Ultrasonic Sensor: Obstruction Detector
    - 3.4.5. Line Follow Sensor
    - 3.4.6. Additional Sensors not Included in the Kit
    - 3.4.7. mBot Face
    - 3.4.8. Robot Operation with the APP
  - 3.5. How to Design your Teaching Materials?
    - 3.5.1. Skill Development with Technology
    - 3.5.2. Working on Projects Linked to the School Curriculum
    - 3.5.3. How Is a Robotics Session Held in the Primary School Classroom?



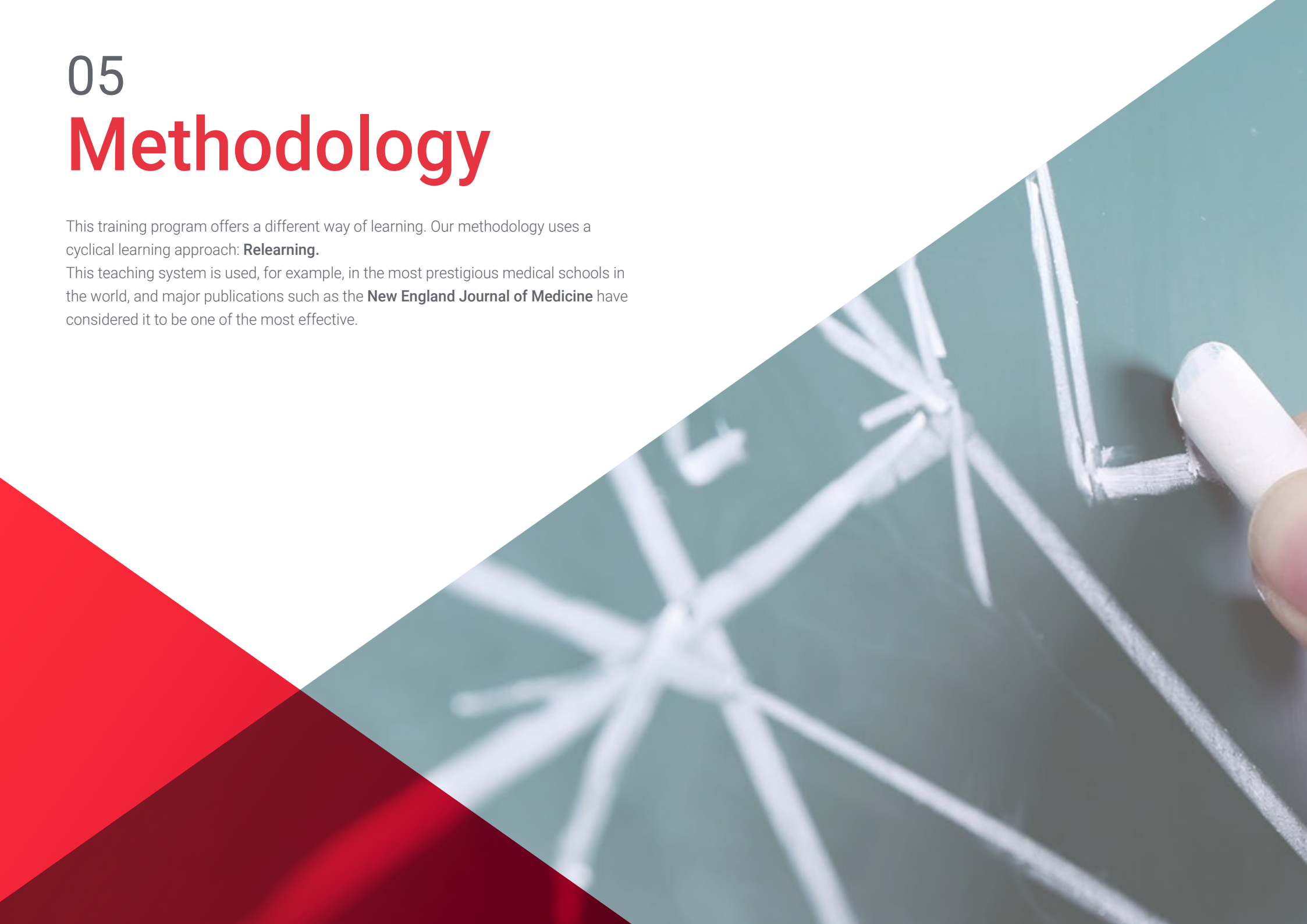
*Teach Robotics and offer top-level learning with this comprehensive Postgraduate Diploma"*

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

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

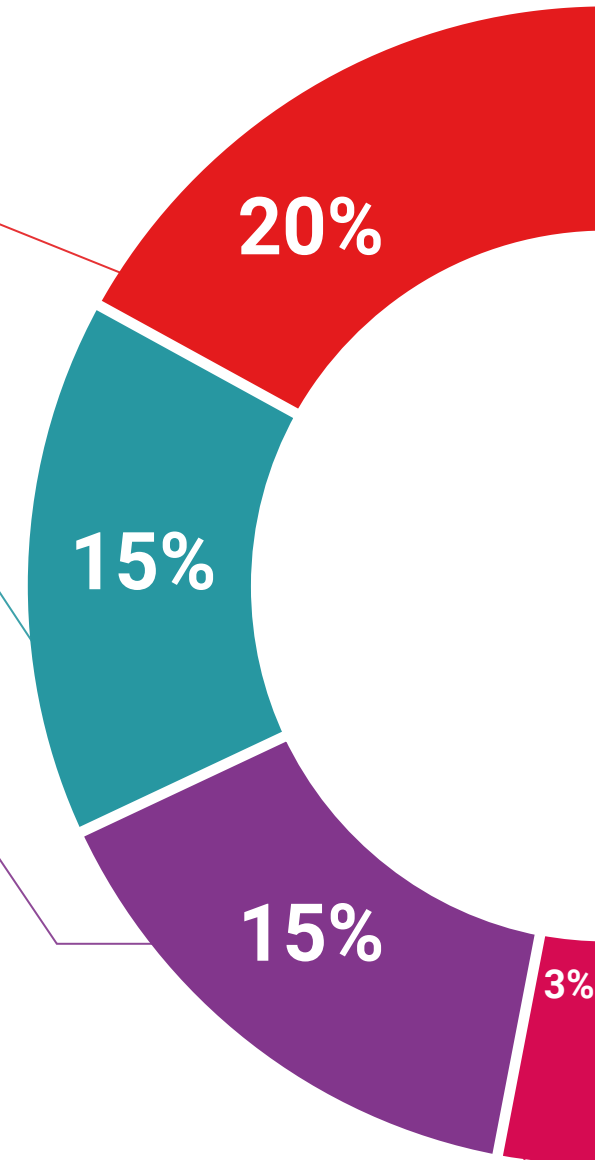
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

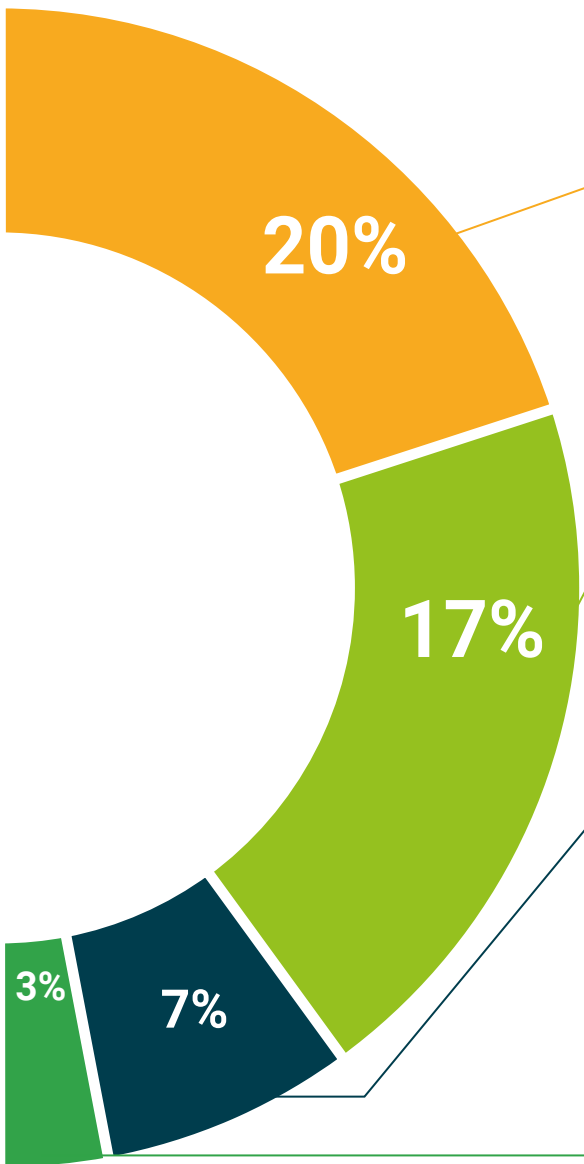
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



### 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.





**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 their 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 Educational Robotics in Primary 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 Educational Robotics in Primary 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 diploma 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 Educational Robotics in Primary Education**

Official N° of Hours: **425 h.**



\*Apostille Convention. In the event that the student wishes to have their paper diploma 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 quality  
development language  
virtual classroom



## Postgraduate Diploma Educational Robotics in Primary Education

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



# Postgraduate Diploma Educational Robotics in Primary Education

