

# Postgraduate Certificate

## Item Response Theory and its Applications in Educational Research





## Postgraduate Certificate Item Response Theory and its Applications in Educational Research

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

Website: [www.techtute.com/in/education/postgraduate-certificate/item-response-theory-applications-educational-research](http://www.techtute.com/in/education/postgraduate-certificate/item-response-theory-applications-educational-research)

# Index

01

Introduction

---

*p. 4*

02

Objectives

---

*p. 8*

03

Structure and Content

---

*p. 1*

04

Methodology

---

*p. 22*

05

Certificate

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*p. 30*

# 01

# Introduction

Get up to date on Item Response Theory and its Applications in Educational Research. This program offers quality training, with a program that is up to date with the main developments in the field and that will help to achieve success in the profession. A 100% online program that you can balance with the rest of your obligations.



# IRT

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*Do not miss the opportunity to take this Postgraduate Certificate with us and you will notice how every day you will be better able to help your students”*

The main objectives of the Postgraduate Certificate in Item Response Theory and its Applications in Educational Research are to promote and strengthen the skills and abilities of teachers, taking into account the most current tools for teaching. This is done in such a way that the teacher is able to inspire their students with the motivation they need to continue their studies and to feel drawn to scientific research.

This Postgraduate Certificate provides teachers with an overview of the fundamental knowledge in the field of teaching and the best way to guide and orient students in their day to day work.

This program stands out for its order and distribution of theoretical material, guided practical examples in all its modules, and motivational and explanatory videos. Allowing a simple and clear study on educational research.

In this way, the main methodologies in the field of educational research will be explained to the student, focusing on everything related to Item Response Theory (IRT), including its characteristics, the Generalizability Theory, the response models for dichotomous and polytomous items, or the differential functioning of the item.

A high level program that will represent a process of improvement, not only professionally, but also personally. This challenge is one of TECH Technological University's social commitments: to help highly qualified professionals train and develop their personal, social and professional skills throughout the course of their studies.

Not only does it cover the theoretical knowledge offered, but it also shows another way of studying and learning, one which is more organic, simpler and more efficient. TECH works to keep you motivated and to create a passion for learning. And it will push you to think and develop critical thinking.

This **Postgraduate Certificate in Item Response Theory and its Applications in Educational Research** contains the most complete and up to date educational program on the market. The most important features of the program include:

- ♦ The development of case studies presented by experts in educational research
- ♦ The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional development
- ♦ Practical exercises where self assessment can be used to improve learning
- ♦ Its special emphasis on innovative methodologies in the teaching of Item Response Theory and its Applications in Educational Research
- ♦ 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



*Expand your knowledge through this Postgraduate Certificate in Item Response Theory and its Applications in Educational Research. It will allow you to improve your professional profile and the way you deliver your lessons"*

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*This program is the best investment you can make when selecting a refresher program to update your knowledge in Item Response Theory and its Applications in Educational Research”*

*If you want to train with the best teaching methodology and multimedia, this is your best option.*

*This program is 100% online, which will allow you to balance your professional work with your private life, while increasing your knowledge in this field.*

Its teaching staff includes professionals belonging to the field of innovation in education, who bring their work experience to this training, as well as renowned 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 training programmed to train 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 teacher will be assisted by an innovative interactive video system developed by recognized experts, with great experience in Item Response Theory and its Applications in Educational Research.





# 02

# Objectives

The objective is to train highly qualified professionals for work experience. An objective that is complemented, moreover, in a global manner, by promoting human development that lays the foundations for a better society. This objective is focused on helping professionals reach a much higher level of expertise and control.







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*Our goal is to achieve excellence  
and help you achieve it too"*



## General Objectives

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- ♦ Qualify professionals for the exercise of Research in Education
- ♦ Learn how to carry out specific programs to improve school performance
- ♦ Access to the forms and processes of Educational Research in the school environment
- ♦ Analyze and integrate the knowledge necessary to foster student's school and social development



*Our objective is very simple: to offer you quality training, with the best teaching system available today, so that you can achieve excellence in your profession"*





## Specific Objectives

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- ◆ Become familiar with IRT for the development and study of the data collection instrument
- ◆ Introduce the student to the basic concepts of IRT
- ◆ Understand the different models for item analysis
- ◆ Know how to apply the different models for item analysis
- ◆ Analyze the quality of measurement instruments through the IRT premises
- ◆ Apply this theory to other measurement processes in education

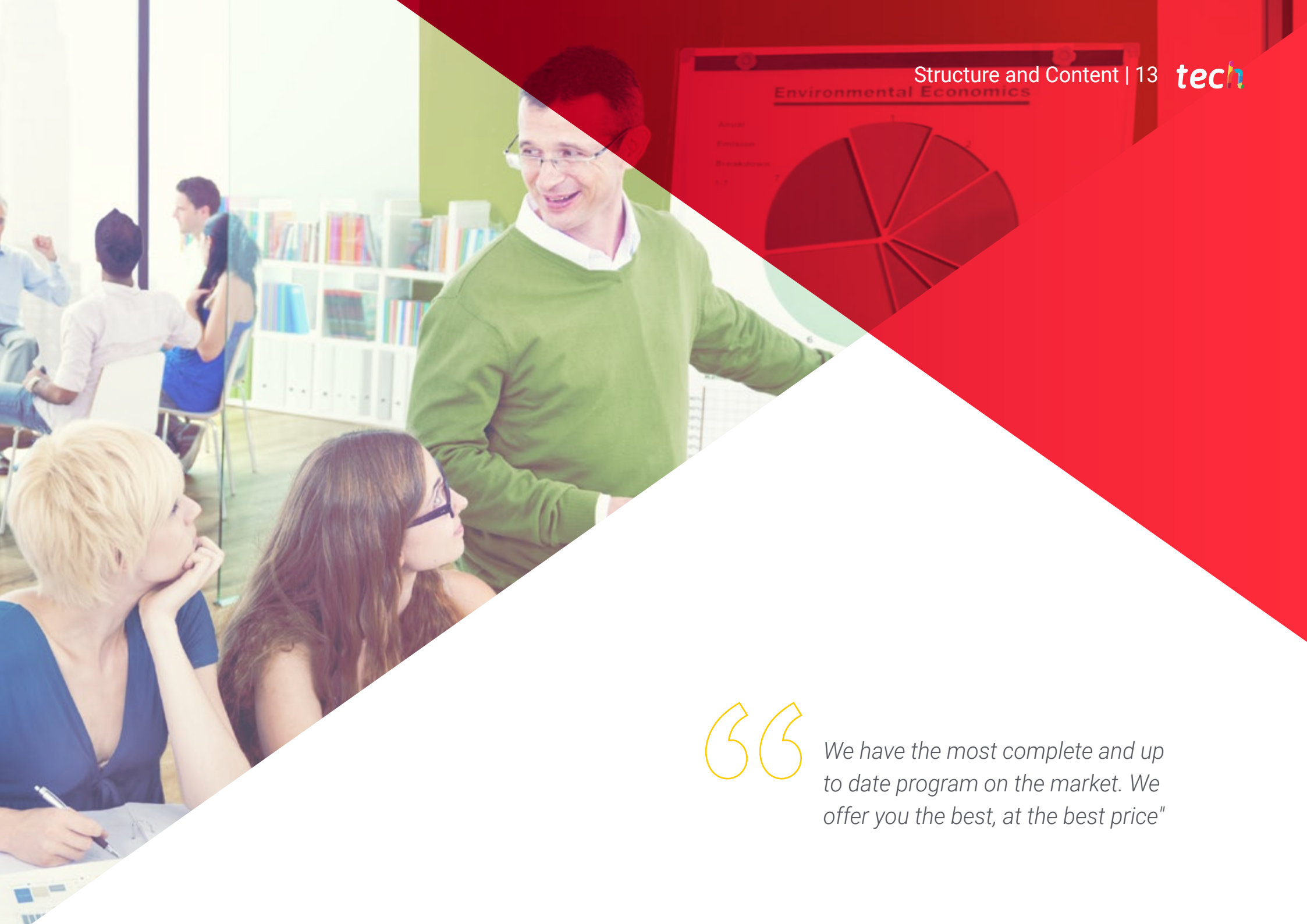
# 03

# Structure and Content

The structure of the contents has been designed by the best professionals in the field of Educational Research, with extensive experience and recognized prestige in the profession, backed by the volume of cases reviewed and studied, and with extensive knowledge of new technologies applied to teaching.







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*We have the most complete and up to date program on the market. We offer you the best, at the best price"*

## Module 1. Item Response Theory (IRT)

- 1.1. Item Response Theory (IRT)
  - 1.1.1. Introduction
  - 1.1.2. Measurement Models
  - 1.1.3. Fundamental Concepts of IRT
  - 1.1.4. Basic Postulates of IRT
- 1.2. Generalizability Theory (GT)
  - 1.2.1. Introduction
  - 1.2.2. Generalizability Theory (GT)
  - 1.2.3. Facets of Generalizability Theory
  - 1.2.4. Interpretation of Results in a Study
- 1.3. Characteristics of IRT (I)
  - 1.3.1. Introduction
  - 1.3.2. Historical Introduction of IRT
  - 1.3.3. IRT Assumptions
  - 1.3.4. IRT models
- 1.4. Characteristics of IRT (II)
  - 1.4.1. Introduction
  - 1.4.2. IRT Results
    - 1.4.2.1. Parameters.
    - 1.4.2.2. Item Characteristic Curve
    - 1.4.2.3. True Score
    - 1.4.2.4. Test Characteristic Curve
    - 1.4.2.5. Level of Information
  - 1.4.3. Response Models: The Item Characteristic Curve
  - 1.4.4. Question Selection Methods
- 1.5. Response Models for Dichotomous Items: The Rasch Contribution
  - 1.5.1. Introduction
  - 1.5.2. The Rasch Model
  - 1.5.3. Characteristics of the Rasch Model
  - 1.5.4. Example (Rasch Model)
- 1.6. Response Models for Dichotomous Items: The Rasch Contribution
  - 1.6.1. Introduction
  - 1.6.2. Birnbaum's Logistic Model (1968)
  - 1.6.3. Model Parameters
    - 1.6.3.1. 2-parameter Logistic Model
    - 1.6.3.2. 3-parameter Logistic Model
    - 1.6.3.3. 4-parameter Logistic Model
- 1.7. Response Models for Polytomous Items: Nominal Item Models (Block, 1972)
  - 1.7.1. Introduction
  - 1.7.2. Polytomous Items
  - 1.7.3. Nominal Response Models (Block, 1972)
  - 1.7.4. Political Item Parameters
- 1.8. Response Models for Polytomous Items: Ordinal Item Models
  - 1.8.1. Introduction
  - 1.8.2. Ordinal Item Models
  - 1.8.3. Ordinal Cumulative Model
    - 1.8.3.1. Samejima's Graded Response Model (GRM) (1969)
    - 1.8.3.2. Modified Graded Response Model (M-GRM) of Muraki (1990)
  - 1.8.4. Continuous Ordinal Models
    - 1.8.4.1. Sequential Model (Tutz, 1990)
  - 1.8.5. Adjacent Ordinal Models
    - 1.8.5.1. Partial Credit Model (Masters, 1982)
- 1.9. Response Model for Polytomous Items: Samejima's (1969) Graded Response Model
  - 1.9.1. Introduction
  - 1.9.2. Normal Graded Response Model
  - 1.9.3. Graded Response Logistic Model
  - 1.9.4. Example (Graded Response Model)
- 1.10. Differential Item Functioning (DIF)
  - 1.10.1. Introduction
  - 1.10.2. The Concept of Differential Item Functioning (DIF)
  - 1.10.3. Types of DIF
  - 1.10.4. DIF Screening Methods
  - 1.10.5. Purification Methods



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*A comprehensive program that will take you through the knowledge you need to compete among the best”*



04

# 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 Harvard 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.



05

# Certificate

The Postgraduate Certificate in Item Response Theory and its Applications in Educational Research guarantees students, in addition to the most rigorous and up to date education, access to a Postgraduate Certificate issued by TECH Technological University.





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

This **Postgraduate Certificate in Item Response Theory and its Applications in Educational Research** contains the most complete and up to date educational program on the market.

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

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

**Title: Postgraduate Certificate in Item Response Theory and its Applications in Educational Research**

**Official N° of hours: 150 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.

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community commitment

innovation

personalized service

knowledge present

online tra

development languages

virtual classroom

**tech** technological  
university

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and its Applications in  
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