Postgraduate Diploma
Tools for Health Research

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Postgraduate Diploma
Tools for Health Research

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

Website: **www.techtitute.com/pk/physiotherapy/postgraduate-diploma/postgraduate-diploma-tools-health-research**

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01

Introduction

Current research tools are equipped with new technologies that accelerate their processes. Among them, AI, Big Data and Statistics stand out. The analytical methodology applied to the field of Physiotherapy has only demonstrated the effectiveness of non-pharmacological intervention on individuals. However, the professional intrusion in this field, unbalances the foundations of its practice. For this reason, companies demand highly qualified specialists with specific knowledge to encourage scientific studies in the area. Therefore, TECH has developed a complete and rigorous program that explores the generation of projects, statistical techniques of Data Mining with R and graphical representations of the results, among other issues. All this, through a 100% online format that allows the adaptation of the pace of study according to the needs of students.

With this Postgraduate Diploma you will get all the keys in the types of graphics and survival analysis to add value to your own and collaborative projects"

The strong demand that exists in the current research sector, directly confronts individuals who develop physiotherapeutic practice with lack of knowledge. This reality means that on many occasions patients reject non-pharmacological therapies and lean towards the most intrusive intervention, deteriorating their wellbeing. This is the reason why companies make a narrow selection to choose the professionals that make up their teams.

Taking this reality into account, TECH has designed a comprehensive program in Physiotherapeutic Research that aims to update the knowledge of specialists in this field. To this end, the Technological University has provided itself with a team of experts in the area of Health Sciences that it has developed and that will be in charge of teaching the subject. It is a study that deepens the management of clinical information, key to the management of the social and health field, as well as research and publication of articles, theses and applied reports. Thus, it is a unique opportunity for experts who are committed to new technologies applied to their professional performance.

The present program has a 100% online modality, which allows for the monitoring of the subject without leaving aside the other activities of the daily life of the specialists, such as their employment or motherhood. In this sense, TECH has also incorporated innovative pedagogical tools that facilitate and speed up the assimilation of the contents. An example of this is the Relearning methodology, which exempts students from long hours of memorization common in other orthodox programs.

This **Postgraduate Diploma in Tools for Health Research** contains the most complete and up-to-date scientific program on the market. The most important features include:

- Case studies presented by experts in Health Sciences Research
- The graphic, schematic, and practical contents with which they are created, provide medical 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

Intervene in scientific studies by applying statistics and R which are decisive in the advancement of physiotherapeutic research with this Postgraduate Diploma"

Don't be left behind in the updating process, master the new statistical methods thanks to the theoretical and practical knowledge of TECH"

Get all the knowledge about Poisson and Negative Binomial regression inflated by zeros and offer a more accurate service in your area of work.

Delve into the treatment of outlier data and use advanced technological tools to gain in-depth knowledge of R strategies.

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

Its 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 an immersive education programmed to learn in real situations.

The design of this program focuses on Problem-Based Learning, by means of which the professional must try to solve the different professional practice situations that are presented throughout the academic course. For this purpose, the student will be assisted by an innovative interactive video system created by renowned experts.

02

Objectives

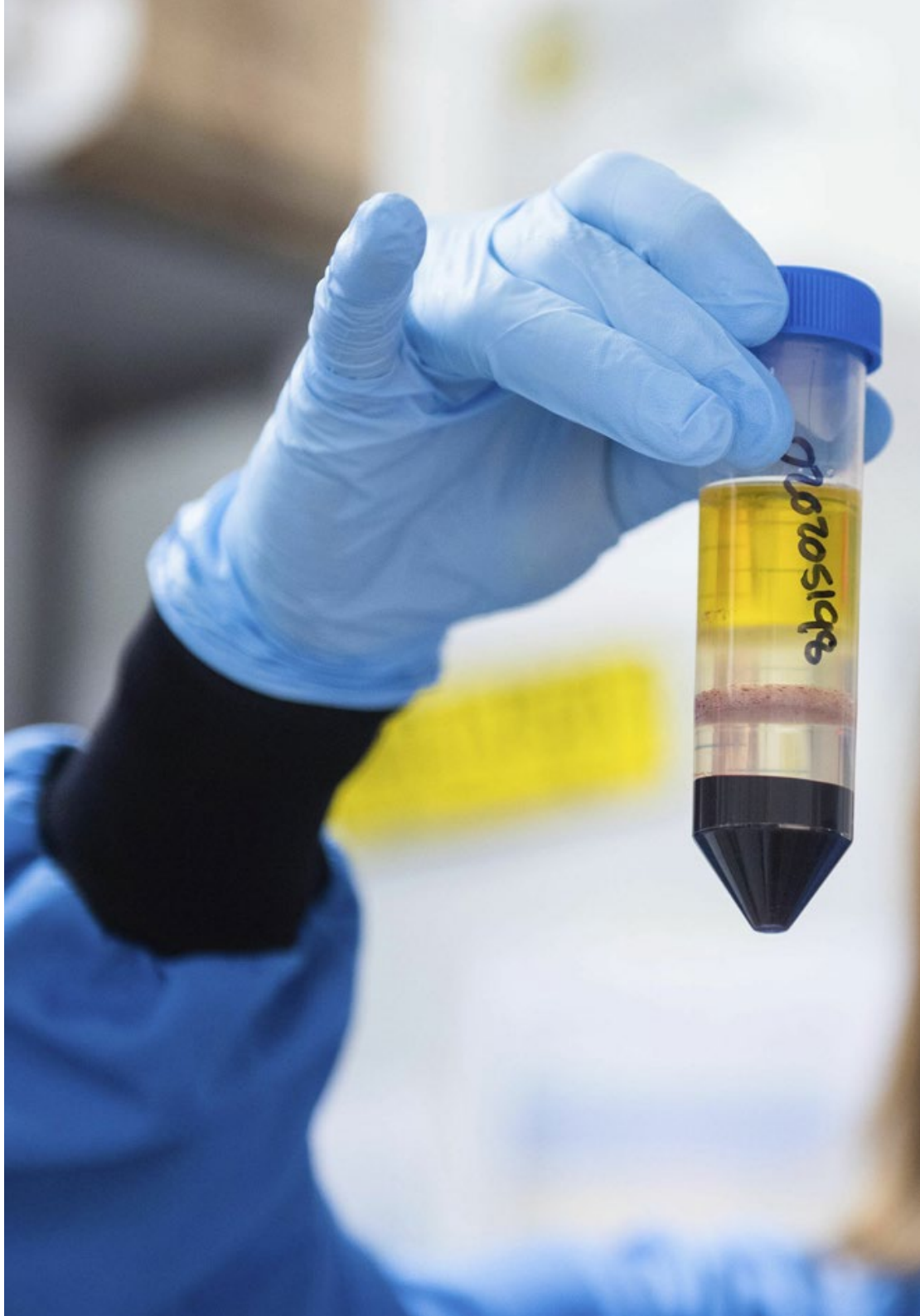
The main objective of this Postgraduate Diploma in Tools for Health Research is to offer students the most updated content on the interpretation of information and the use of statistical tools. Likewise, the didactic and innovative material offered by TECH in all its degrees brings students directly to the scientific methodology integrated by companies specialized in field work. All this, so that today's jurists can project their professional careers, together with a specialized teaching team with whom they can discuss and carry out an exhaustive follow-up of the subject.

Achieve your objectives, master the structure of Physiotherapy research projects which is a key element for their performance"

General Objectives

- Adequately formulate a question or problem to be solved
- Asses the state of the art of the problem through literature search
- Assess the feasibility of the potential project
- Draft projects in accordance with the different calls for proposals
- Look for A Funding Model
- Master the necessary data analysis tools
- Writing scientific articles (papers) according to the target magazines
- Identify the main tools for dissemination to the non-specialized public

Choose the pace of study according to your needs and make this university degree compatible with the rest of your life, thanks to TECH"



Specific Objectives

Module 1. Generation of Research Projects

- Learn how to assess the feasibility of the potential project
- Know in depth the essential milestones for writing a research project
- Delve into the criteria for exclusion/inclusion in projects
- Learn how to set up the specific team for each project

Module 2. Statistics and R in Health Research

- Describe the main concepts of biostatistics
- Learn how to use the R program
- Define and understand the regression method and multivariate analysis with R
- Recognize the concepts of statistics applied to research
- Describe the statistical techniques of *data mining*
- Provide knowledge of the most commonly used statistical techniques in biomedical research

Module 3. Graphical Representations of Data in Health Research and Other Advanced Analysis

- Master the tools of computational statistics
- Learn to generate graphs for the visual interpretation of data obtained in research project
- Obtain in-depth knowledge of dimensionality reduction methods
- Delve into the comparison of methods

03

Course Management

TECH has narrowly selected an experienced teaching group in Physiotherapy and its development, to contribute to the creation of the degree and teach the contents. In this way, the enrolled professional will have the figure of research team leaders who apply all the innovative tools to streamline processes and provide the efficiency required in them. Thanks to their collaboration, the graduates will not only obtain theoretical contents, but will also have the keys to the real scenario, which have been based on the experts' own development.

Achieve your goals thanks to TECH's tools and the mentoring of great professionals versed in Health Research"

Management

Dr. López-Collazo, Eduardo

- Scientific Deputy Director in the Institute for Health Research the Health Research Institute of La Paz University Hospital
- Head of the Department of Inmune Response and Infectious Diseases at IdiPAZ
- Head of the Department of Inmune Response, Tumors and Immunology at IdiPAZ
- President of the IdiPAZ Research Commission
- Sponsor of the External Scientific Committee of the Murcian Institute of Health Research
- Member of the Scientific Commission of FIDE
- Editor of the international scientific journal "Mediators of Inflammation"
- Editor of the international scientific journal "Frontiers of Immunology"
- Coordinator of IdiPAZ Platforms
- Coordinator of Health Research Funds in the areas of Cancer, Infectious Diseases and HIV
- PhD in Nuclear Physics, University of La Habana
- Doctorate in Pharmacy from the Complutense University of Madrid

Professors

Mr. Arnedo Abade, Luis

- Data & Analyst Manager
- Data Scientist & Analyst Manager in Industrias Arnedo
- Data & Analyst Manager in Boustique Perfumes
- Data Scientist & Analyst Manager in Darecod
- Postgraduate Certificate in Statistics
- Psychology Graduate

Dr. Avendaño Ortiz, José

- Sara Borrell Researcher Foundation for Biomedical Research of the Ramón y Cajal University Hospital (FIBioHRC/IRyCIS)
- Researcher Foundation for Biomedical Research of La Paz University Hospital (FIBHULP/ IdiPAZ)
- Researcher HM Hospitals Foundation (FiHM)
- Graduate in Biomedical Sciences from the University of Lleida
- Master's Degree in pharmacological research from the Autonomous University of Madrid
- PhD in Pharmacology and Physiology from the Autonomous University of Madrid

Dr. Pascual Iglesias, Alejandro

- Bioinformatics Platform Coordinator, La Paz Hospital
- Advisor to the COVID-19 Expert Committee of Extremadura
- Researcher in Eduardo López-Collazo's innate immune response research group, Instituto de Investigación Sanitaras University Hospital La Paz
- Researcher in the coronavirus research group of Luis Enjuanes, National Center of Biotechnology CNB-CSIC
- Coordinator of Continuing Education in Bioinformatics, Health Research Institute of the University Hospital La Paz
- Cum Laude Doctor in Molecular Biosciences from the Autonomous University of Madrid
- Degree in Biology Molecular from the University of Salamanca
- Professional Master´s Degree in Cellular and Molecular Physiopathology and Pharmacology from the Universidad of Salamanca

04

Structure and Content

The syllabus of this Postgraduate Diploma has been prepared by a teaching team specialized in Health Sciences, whose main objective is to offer students the most comprehensive content on statistics in research and the generation of projects. The program has a theoretical-practical approach, so that students can delve into the particularities of observation with R and the graphical representations of the results, among other issues. In addition, the Relearning system, based on the reiteration of content, exempts specialists from long hours of memorization and allows progressive and easy study.

Learn how to use innovative tools such as GLM and GAMM and work with samples with guaranteed success"

Module 1. Generation of Research Projects

1.1. General Structure of a Project
1.2. Presentation of Background and Preliminary Data
1.3. Definition of the Hypothesis
1.4. Definition of General and Specific Objectives
1.5. Definition of the Type of Sample, Number and Variables to be Measured
1.6. Establishment of the Scientific Methodology
1.7. Exclusion/Inclusion Criteria in Projects with Human Samples
1.8. Establishment of the Specific Team: Balance and Expertise
1.9. Ethical aspects and Expectations: an Important Element that we Forget
1.10. Budget Generation: a fine Tuning between the Needs and the Reality of the Call

Module 2. Statistics and R in Health Research

2.1. Biostatistics
  2.1.1. Introduction to The Scientific Method
  2.1.2. Population and Sample. Sampling Measures of Centralization
  2.1.3. Discrete Distributions and Continuous Distributions
  2.1.4. General Outline of Statistical Inference. Inference about a Normal Population Mean. Inference about a General Population Mean
  2.1.5. Introduction to Nonparametric Inference
2.2. Introduction to R
  2.2.1. Basic Features of the Program
  2.2.2. Main Object Types
  2.2.3. Simple Examples of Simulation and Statistical Inference
  2.2.4. Graphs
  2.2.5. Introduction to R Programming
2.3. Regression Methods with R
  2.3.1. Regression Models
  2.3.2. Variable selection
  2.3.3. Model diagnosis
  2.3.4. Outlier treatment
  2.3.5. Regression analysis

2.4. Multivariate Analysis with R
- 2.4.1. Description of Multivariate Data
- 2.4.2. Multivariate Distributions
- 2.4.3. Dimension Reduction
- 2.4.4. Unsupervised Classification: Cluster Analysis
- 2.4.5. Supervised Classification: Discriminant Analysis

2.5. Regression Methods for Research with R
- 2.5.1. Generalized Linear Models (GLM): Poisson Regression and Negative Binomial Regression
- 2.5.2. Generalized Linear Models (GLM): Logistic and Binomial Regressions
- 2.5.3. Poisson and Negative Binomial Regression Inflated by Zeros
- 2.5.4. Local Fits and Generalized Additive Models (GAMs)
- 2.5.5. Generalized Mixed Models (GLMM) and Generalized Additive Mixed Models (GAMM)

2.6. Statistics Applied to Biomedical Research with R I
- 2.6.1. Basic Notions of R. Variables and Objects in R. Data handling Files Graphs
- 2.6.2. Descriptive Statistics and Probability Functions
- 2.6.3. Programming and Functions in R
- 2.6.4. Contingency Table Analysis
- 2.6.5. Basic Inference with Continuous Variables

2.7. Statistics Applied to Biomedical Research with R II
- 2.7.1. Analysis of Variance
- 2.7.2. Correlation Analysis
- 2.7.3. Simple Linear Regression
- 2.7.4. Multiple Linear Regression
- 2.7.5. Logistic Regression

2.8. Statistics Applied to Biomedical Research with R III
- 2.8.1. Confounding Variables and Interactions
- 2.8.2. Construction of a Logistic Regression Model
- 2.8.3. Survival Analysis
- 2.8.4. Cox Regression
- 2.8.5. Predictive Models. ROC Curve Analysis

2.9. Statistical Data Mining Techniques with R I
- 2.9.1. Introduction. Data Mining. Supervised and Unsupervised Learning Predictive Models Classification and Regression
- 2.9.2. Descriptive Analysis Data Pre-Processing
- 2.9.3. Principal Component Analysis (PCA)
- 2.9.4. Cluster Analysis. Hierarchical Methods. K-Means

2.10. Statistical Data Mining Techniques with R II
- 2.10.1. Model Evaluation Measures. Predictive Ability Measures. ROC Curves
- 2.10.2. Models Assessment Techniques. Cross-Validation. Bootstrap Samples
- 2.10.3. Tree-Based Methods (CART)
- 2.10.4. Support Vector Machines (SVM)
- 2.10.5. Random Forest (RF) and Neural Networks (NN)

Module 3. Graphical Representations of Data in Health Research and Other Advanced Analysis

3.1. Types of Graphs
3.2. Survival Analysis
3.3. ROC Curves
3.4. Multivariate Analysis (Types of Multiple Regression)
3.5. Binary Regression Models
3.6. Massive Data Analysis
3.7. Dimensionality Reduction Methods
3.8. Comparison of Methods: PCA, PPCA and KPCA
3.9. T-SNE (t-Distributed Stochastic Stochastic Neighbor Embedding)
3.10. UMAP (Uniform Manifold Approximation and Projection)

05

Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning.**

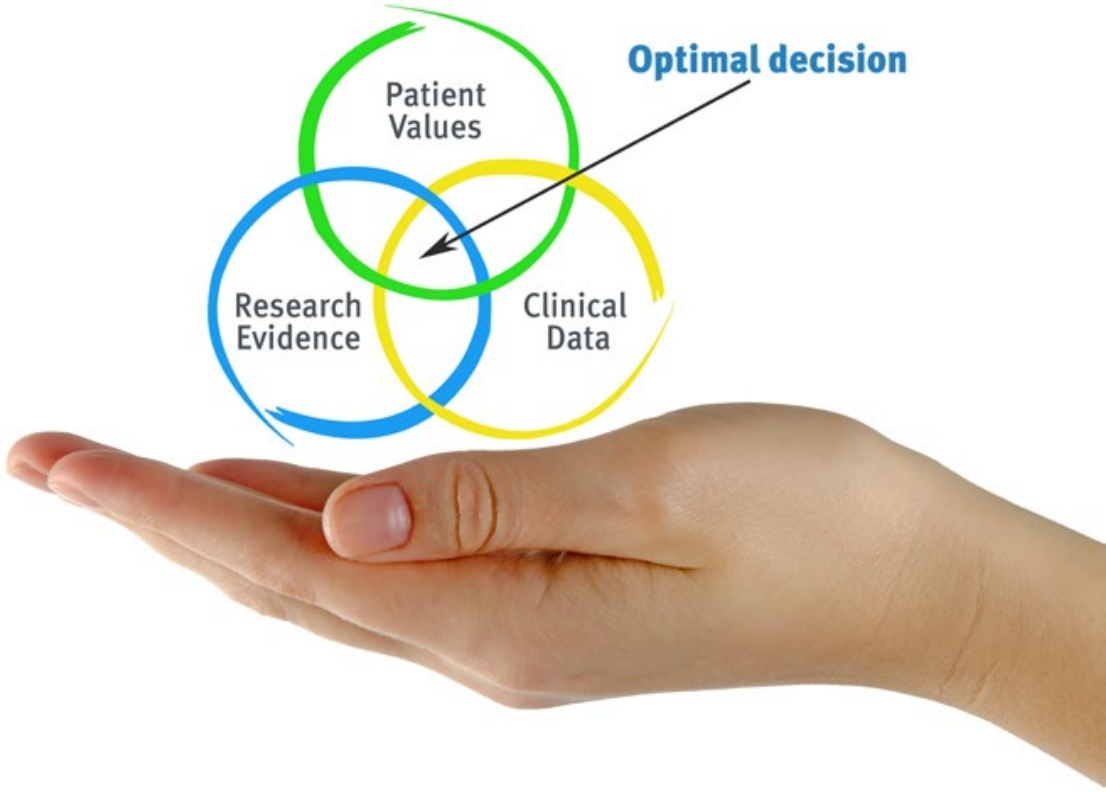
This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

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 we use the Case Method

What should a professional do in a given situation? Throughout the program, students will face multiple simulated clinical cases, based on real patients, in which they will have to do research, establish hypotheses, and ultimately resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Physiotherapists/kinesiologists learn better, faster, and more sustainably over time.

With TECH you will experience a way of learning that is shaking the foundations of traditional universities around the world.



According to Dr. Gérvas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, trying to recreate the real conditions of professional physiotherapy practice.

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:

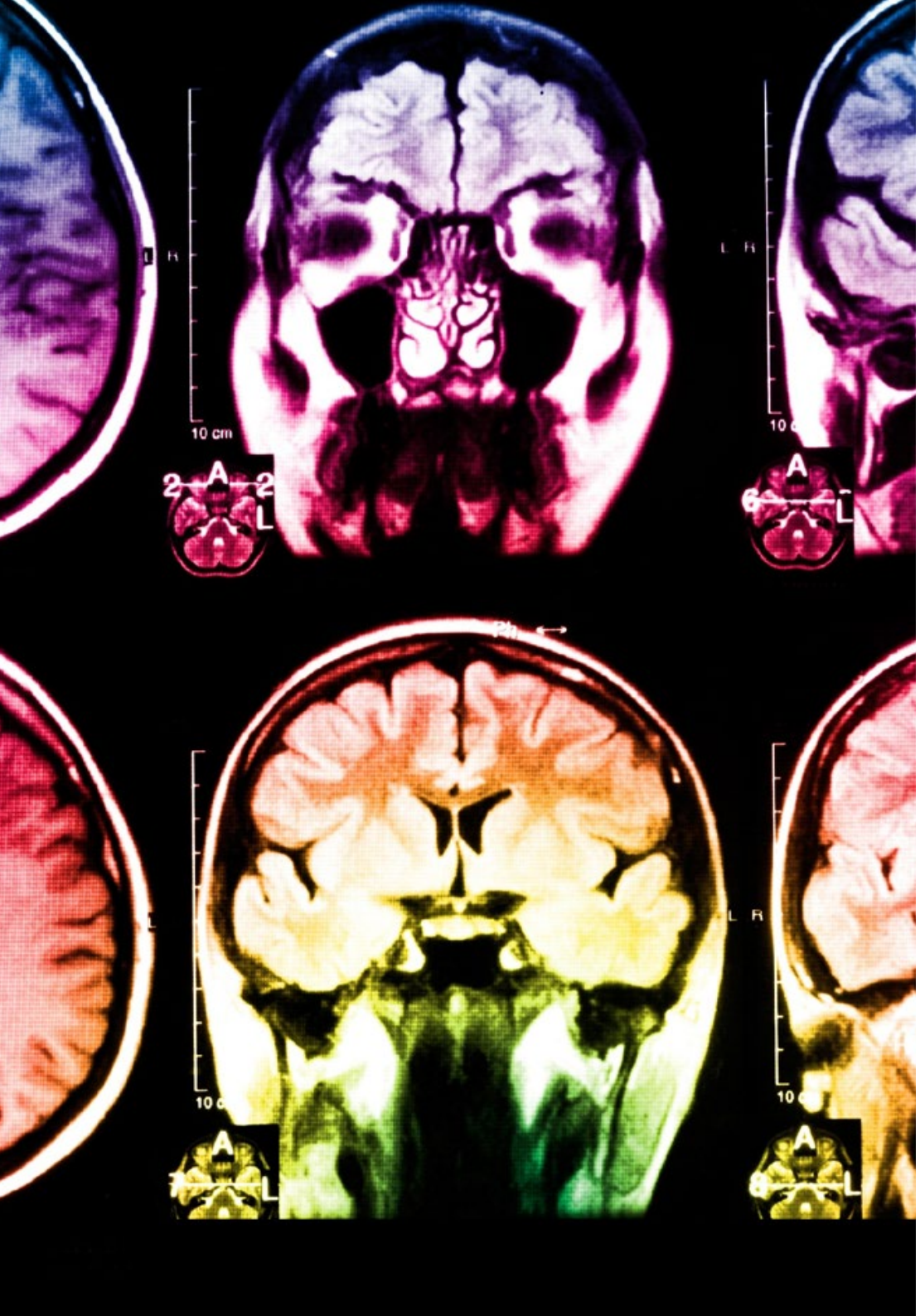
1. Physiotherapists/kinesiologists who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their knowledge.
2. The learning process has a clear focus on practical skills that allow the physiotherapist/kinesiologist to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
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.

This university is the first in the world to combine the study of clinical cases with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, a real revolution with respect to the mere study and analysis of cases.

The physiotherapist/kinesiologist 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 trained more than 65,000 physiotherapists/kinesiologists with unprecedented success in all clinical specialties, regardless of the workload. Our pedagogical methodology is developed in a highly competitive environment, with a university student body with a strong socioeconomic profile and an average age of 43.5 years old.

Relearning will allow you to learn with less effort and better performance, involving you more in your training, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation for 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 specialists who teach the course, specifically for the course, so that the teaching content is highly 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.

Classes

There is scientific evidence suggesting that observing third-party experts can be useful.

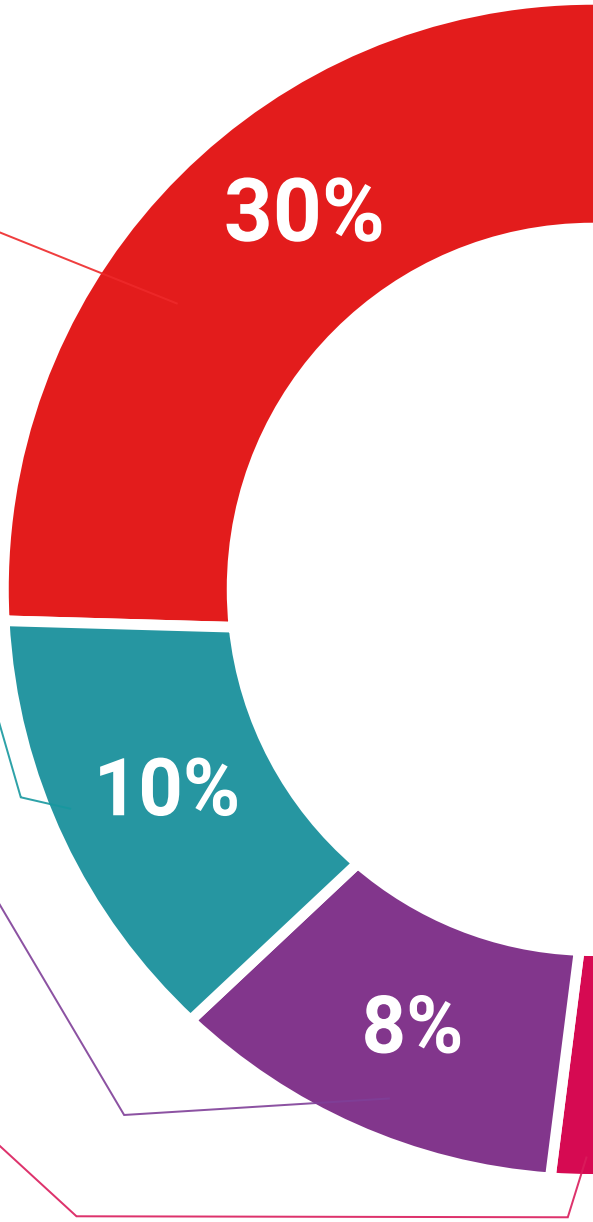
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

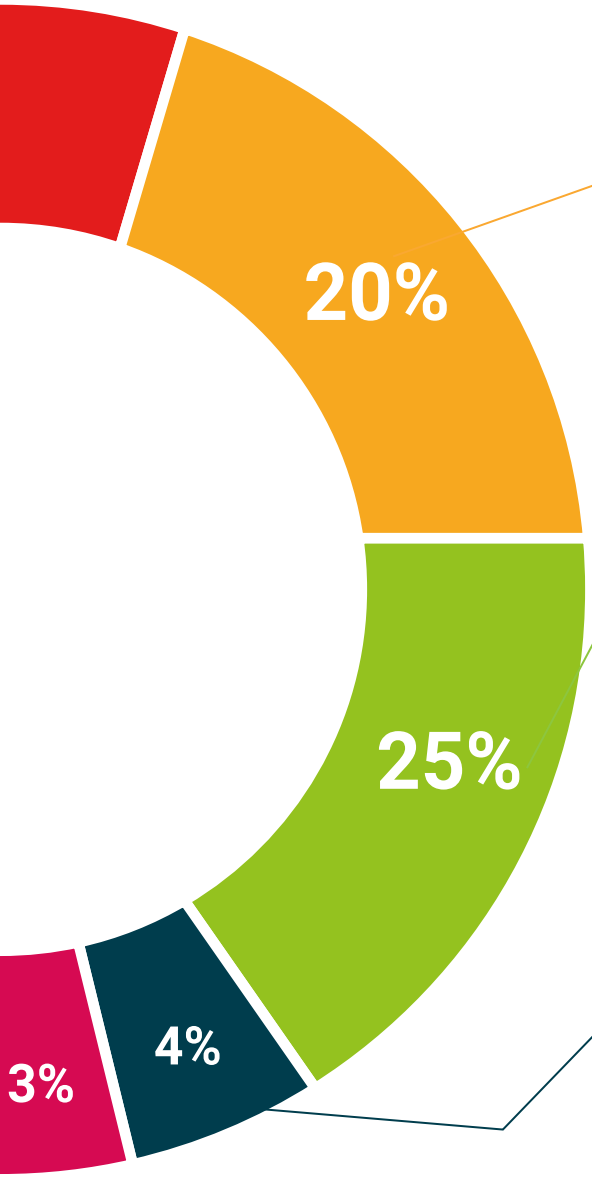
Practising Skills and Abilities

They will carry out activities to develop specific competencies and skills in each thematic area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.

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.





Case Studies

Students will complete a selection of the best case studies chosen specifically for this situation. Cases that are presented, analyzed, and supervised by the best specialists in the world.

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".

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.

06

Certificate

The Postgraduate Diploma in Tools for Health Research 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 Tools for Health Research** contains the most complete and up-to-date scientific 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 Tools for Health Research**

Official Nº of Hours: **450 h.**

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Awards the following

CERTIFICATE

to

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

For having passed and accredited the following program

POSTGRADUATE DIPLOMA

in

Tools for Health Research

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

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country.

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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