



# IAPHE'18

Innovative Academic Practices  
in Higher Education

How to make them more sustainable

## International Seminar e-book

September 27th, 2018

Research Centre on Didactics and Technology  
in the Education of Trainers

Department of Education and Psychology  
University of Aveiro  
Portugal

<http://iaphe.web.ua.pt/>



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Innovative Academic Practices  
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How to make them more sustainable

**International Seminar e-book**

**Coordinators**

Cecília Guerra

Amanda Franco

Mónica Seabra



**Title**

IAPHE'18 – Innovative academic practices in higher education – how to make them sustainable: International seminar e-book

**Coordinators**

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## Welcome to IAPHE'18

Welcome to IAPHE'18 - "**Innovative Academic Practices in Higher Education: How to make them more sustainable**", organized by the CIDTFF - *Centro de Investigação Didáctica e Tecnologia na Formação de Formadores* (Research Centre Didactics and Technology in the Education of Trainers), at the **Department of Education and Psychology** of University of Aveiro, in Portugal. We are pleased to welcome you in Aveiro to discuss about the sustainability of educational innovations in higher education.

With such a goal at heart, IAPHE'18 creates the perfect context for researchers in education, university teachers, and decision-makers in the fields of education and research to discuss how innovation that is produced in higher education may outlive its original funding projects, reaching the community outside campus.

We hope that this is a valuable opportunity for close networking that outlasts this event!

Organizing Committee

Cecília Guerra

Amanda Franco

Mónica Seabra







## Context

In the context of higher education (HE) modernization, many actors (e.g., educational researchers, teachers) have been working on behalf of innovation in teaching, learning and assessment (TLA), namely in Sciences and Engineering courses, to foster students' academic achievement (Guerra & Costa, 2017; Gunn & Mintrom, 2016; Fung, 2017). Educational innovation that is here under consideration relates to the introduction of an idea, resource, process, and/or strategy with the aim of improving a certain practice (Stirman et al., 2012). International studies (Barnett, 1997, 2015; Bryan & Clegg, 2006; Getz, Siegfried, & Anderson, 1997; Hoidn & Kärkkäinen, 2014; Santa, 2011) keep on demonstrating that, besides the impact of such educational innovations on students' learning, they also contribute for teachers' academic development.

Building closer links between research and teaching has become an important way to enhance the quality of HE across the world (Tong, Standen, & Sotiriou, 2018). In Portugal, researchers and teachers from several higher education institutions (HEI) have been obtaining funds to develop educational innovations, namely in courses in the area of Exact Sciences (e.g., Physics), Natural Sciences (e.g., Biology) and, more expressively, Engineering. The innovations that have been developed so far refer mostly to the development of TLA strategies and/or technology-based educational resources, such as remote virtual labs (Guerra & Costa, 2017). The sustainability of research (and educational innovations) depend of several factors, such as: the availability of funding grants for research on educational innovation in HE; the support provided by host institutions to develop such innovations; the characteristics and work dynamics of the elements in the research teams (Guerra & Costa, 2016). It is noteworthy that, and according to a study by Guerra and Costa (2017),

## Context

many of the innovations that are produced in the frame of funded national projects do not always have the expected sustainability due, in particular, to the lack of financial support to keep sustaining and updating such innovations.

Agencies that finance research (European Research Council, 2015) and international authors (Haigh, 2012; Sarriot, Ricca, Yourkavitch, & Ryan, 2008; Savaya, Elsworth, & Rogers, 2009) have stressed the need to define strategies in order to maximize the sustainability of results from funded research after the project ends. One possibility is to invest in strategies to mobilize the scientific knowledge that is produced in the context of funded research (European Research Council, 2015). International authors in the field of educational research (Bennet et al., 2007; Levin, 2011) and, more recently, national authors (Guerra, Tavares, & Araújo e Sá, 2017) make the same recommendation.

Three key-ideas emerge from the aforementioned: the educational innovations that are developed in the context of HE, particularly the ones that are produced with funded research, may (and should) contribute to the transformation and improvement of the academic practices of the elements involved (e.g., teachers and students); the sustainability of educational innovations relies on the continuity of the projects' financing, on the support provided by the host institution, and on the work dynamics of the elements in the research team; the scientific knowledge that is built in the context of a research project may (and should) be disseminated and mobilized in (different ways in) the community (e.g., academic, scientific, political, society in general), to ground the design of formation and research policies.

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## Aims & Target Audience

### Aims

The social appreciation of the scientific knowledge that is produced by research may contribute to ground and direct the design of those policies, in particular the ones concerning the development and sustainability of educational innovations in HE. Hence, the organization of an International Seminar (IS), entitled “Innovative academic practices in higher education: How to make them more sustainable?”, aims to contribute to the need to reflect, disseminate and look for ways to improve the sustainability of the results from research focused on educational innovation in HE.

The aims of the IS are:

- a) to reflect on the sustainability of educational innovations in Higher Education, in particular of those that are developed during the context of funded national projects in Portuguese Public Higher Education Institutions;
- b) to disseminate educational innovations in Higher Education, in particular in the areas of social sciences/education, natural and exact sciences, and engineering;
- c) to discuss possibilities to enhance the collaboration between teachers and researchers who are interested in Innovations in Higher Education (e.g., establishment of an international academic network of reflection & action in educational innovations in HEI).

### Target audience

This is targeted at researchers in Education, university teachers, and decision-makers in the fields of education and research & development projects.

The IAPHE'18 is a bilingual seminar, with Portuguese and English speakers and participants.

## Committees

### Organizing Committee



Cecilia Guerra  
Postdoctoral researcher  
(SFRH/BPD/103497/2014)



Amanda Franco  
Postdoctoral researcher  
(SFRH/BPD/122162/2016)



Mónica Seabra  
PhD Student  
(SFRH/BD/121350/2016)

### Scientific Committee



Helena Araújo e Sá  
CIDTFF Coordinator and  
Associate Professor with  
Aggregation



Nilza Costa  
Full professor



Rui Marques Vieira  
Assistant Professor with  
Aggregation

### Technical Staff



Ana Varela  
CIDTFF Secretariat



Joana Pereira  
CIDTFF Secretariat



Paula Varela  
Financial Management

## Venue

### Venue

The IAPHE'18 will be held at Auditório Mestre Helder Castanheira on 27<sup>th</sup> September 2018.

### Computer and Internet access

Visitors at the University of Aveiro may connect to Eduroam for wireless networking.

**login - educacao.formacao@visit.uaveiro.eu**

**password - formacao**

## Program

9h00:9h15

**Check-in**

### Opening Session

9h15:9h45

- Head of DEP
- Coordinator of CIDTFF
- Members of the Organizing Committee

9h45:10h45

**Lecture** "Making innovative pedagogical approaches sustainable: The case of shaping higher education with students"

Invited Keynote: **Vincent C H Tong**

(Principal Teaching Fellow (Connected Curriculum), University College London, London, United Kingdom)

Overview: The significance of student-staff partnerships and inclusive learning communities in promoting innovative pedagogical approaches and making them sustainable, with applications to academic staff development program.

10h45:11h15

Coffee break & Poster exhibition

11h15:11h30

**Lecture** "Educational innovations developed in Portuguese Higher Education Institutions through national funded projects: how they were promoted and sustained."

Keynote: **Cecilia Guerra**

(Postdoctoral researcher, CIDTFF, UA)

Overview: Characterization of the sustainability of educational innovations developed through national funded research projects implemented between 2006 and 2015 in Portuguese higher education institutions.

11h30:12h45

**Round table** "Towards the sustainability of educational innovations in higher education: how to promote it?"

Moderator: **Nilza Costa**

(Full Professor, DEP, CIDTFF, UA)

Speakers:

- **Celina Leão** (Assistant Professor, University of Minho, Portugal);
- **Filomena Soares** (Assistant Professor, University of Minho, Portugal);
- **Isabel Cristina Gonçalves** (Technical Coordinator of Academic Development Unit, Instituto Superior Técnico, University of Lisbon, Portugal);
- **João Pedro Pêgo** (Assistant Professor, University of Porto, Portugal);
- **José Manuel Martins Ferreira** (Full Professor, Universitetet i Sørøst-Norge, Norway);
- **Vitor H. Carvalho** (Tenured Associate Professor, Polytechnic Institute of Cávado and Ave, Portugal)

Overview: To describe briefly the funded research projects that were developed and which were discussed at the Round Table, and to reflect on the factors that may (or may not) maximize the sustainability of educational innovations in higher education.

12h45:14h00

Lunch break

## Program

14h00:14h30	<p><b>Lecture</b> "How do we prepare today's higher education students for tomorrow's challenges? Teacher education and the promotion of '21st century skills'" Keynote: <b>Amanda Franco</b> (Postdoctoral researcher, CIDTFF, UA)</p> <p>Overview: In the context of European guidelines referring explicitly to the importance of "21st century skills", presentation of the importance of sustained teacher education that is inclusive of critical thinking, to promote – deliberately, explicitly and systematically – students' critical thinking in higher education.</p>
14h30:15h00	<p><b>Lecture</b> "Pathways to change in teaching and learning at the University of Aveiro: notes from 8 years of experience" Keynote: <b>Gillian Moreira</b> (Assistant Professor, University of Aveiro, Portugal)</p> <p>Overview: Retrospective analysis of the actions implemented by the Rector of Universidade de Aveiro concerning the promotion of teachers' academic development (e.g., training workshops, Teaching Day, etc.).</p>
15h00:16h00	<p><b>Poster presentation</b> "My project in higher education in 5 minutes!" Moderator: <b>Mónica Seabra</b> (PhD student of DEP, CIDTFF, UA)</p> <p>Speakers: Researchers with projects focused on the development of educational innovations in the higher education.</p> <p>Overview: Presentation of CIDTFF research projects focused on the promotion of educational innovations in higher education context.</p>
16h00:16h30	<p>Coffee break &amp; Poster exhibition</p>
16h30:17h30	<p>Round table "Building the future of higher education: an agenda for research sustainability" Moderator: <b>Rui Marques Vieira</b> (Assistant Professor, University of Aveiro, Portugal)</p> <p>Speakers: - <b>António Teixeira</b> (University of Aveiro, Portugal) - <b>Heitor Alvelos</b> (University of Aveiro, Portugal) - <b>Isabel Menezes</b> (President of the Portuguese Educational Research Association, Portugal). - <b>Jorge Brandão</b> (Comissão de Coordenação e Desenvolvimento Regional do Centro, Portugal)</p> <p>Overview: To reflect on the policies and strategies that are necessary to establish an agenda in higher education aimed at fostering the scientific, societal, and educational sustainability of research and innovation in the higher education context.</p>
	<p><b>Closing session</b></p> <ul style="list-style-type: none"><li>- Head of DEP</li><li>- Coordinator of CIDTFF</li><li>- Members of the Organizing Committee</li></ul>



**Lecture:**  
**“Making innovative pedagogical approaches sustainable:  
The case of shaping higher education with students”**

Vincent C H Tong  
University College London  
United Kingdom  
vincent.tong@ucl.ac.uk

**Abstract**

Student-staff partnerships have received significant attention from the higher education communities as a way to shape pedagogical practices and to improve student engagement. In this presentation, I will discuss the case of promoting education innovation and scholarship through working with students as partners in highly collaborative settings. In particular, I will focus on working with students as partners to advance research-education synergy. To illustrate these concepts, I will discuss the rationale and organisation of the R=T initiative (Research equals Teaching) at University College London. I will examine how experienced researcher-educators can mentor and inspire students from a wide range of disciplines to shape higher education pedagogy together by producing and editing scholarly outputs beyond their own contexts. As a highly collaborative book project, the R=T initiative has successfully built links between research-based education and student-staff partnerships, promoting innovative practices and inspiring academics and students from both University College London and a number of international partner universities through professional development programmes. Finally,

## Speakers

I will explore the issues of power balance in student-staff partnerships, inclusive pedagogical practices, and making education projects sustainable. (For free download of the published R=T book "Shaping Higher Education with Students", please follow the link on [www.RequalsT.org](http://www.RequalsT.org).)

### Keynote Speaker Biography



**Vincent Tong** is a Principal Teaching Fellow at University College London (UCL). He is the strategic lead of the Connected Curriculum, UCL's institution-wide research-based education initiative.

He is a strong advocate of working with students as partners to shape higher education pedagogy – as he started and continues to lead the R=T project ([www.RequalsT.org](http://www.RequalsT.org)).

Apart from his role as an educator, Vincent is a Principal Investigator of an international research consortium in earth sciences at UCL. He has an academic background in physical sciences, humanities and education.

**Lecture:**

**“Educational innovations developed in Portuguese Higher Education Institutions through national funded projects: how they were promoted and sustained”**

Cecília Guerra  
Department of Education and Psychology  
CIDTFF  
University of Aveiro  
Portugal  
cguerra@ua.pt

**Abstract**

The academic community has been giving increased attention to the development of educational innovations (EI) in Higher Education (HE), particularly through funded research. EI embrace a student-centred approach and are usually associated with a new Teaching, Learning, Assessment (TLA) strategies and/or resources. However, EI that are not imbricated in the classroom dynamics, and are not designed to be used after the project duration, are not sustainable. This lecture presents a study focused on the sustainability of EI developed in public Portuguese HE Institutions. A multiple case study was carried out in order to identify factors that allowed sustaining EI developed in national funded projects between 2004 and 2015. Data collection involved: documental analysis of 37 projects' materials (e.g. scientific reports); interviews with 9 coordinators of 12 selected projects; and questionnaires applied to 18 key-participants of 8 selected projects. Results highlighted two key-factors

## Speakers

that allowed sustaining EI, after the end of the funded period: the financial support for further projects both of funding agencies and/or host institutions; and the dynamics of the coordinators and/or key-participants to implement/modify/expand the EI in other contexts such as courses and/or curricular units. These results allow putting forward some recommendations aimed at funding agencies, academics and politicians targeting the enhancement of the sustainability of educational innovations developed in Higher Education.

### Keynote Speaker Biography



**Cecília Guerra** is Postdoctoral Research Fellow, with a fellowship granted by Fundação para a Ciência (SFRH/BPD/103497/2014), at the Research Centre “Didactics and Technology in Teacher Education”, University of Aveiro (Portugal).

She holds a PhD in Multimedia in Education (2012), a Master’s degree in Communication and Science Education (2007) and a Degree in Teaching of Biology and Geology (2002). She has participated in research projects and collaborated in the organization of scientific events. She was also a teacher assistant in the higher education context and an in-service teacher trainer.

She has several publications in the areas of Science Education, Educational Technology and Academic Development. She holds a technical production, the Courseware Sere: “The Human being and natural resources”.

**Round Table:**  
**“Towards the sustainability of educational innovations in higher education: how to promote it?”**

Nilza Costa  
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**Abstract**

Portuguese agencies that finance research, as for example the Science and Technology Foundation (FCT), had open calls, namely during the years 2004 and 2015, with the main focus of promoting educational innovations in Portuguese Higher Education Institutions (HEI). In this context, several university teachers and researchers received funding support for the development of educational innovations, namely in science courses, e.g. Physics, and, in a most significant number, Engineering (e.g. Mechanical). Educational innovations had been developed in teaching, learning and assessment strategies (e.g., peer assessment) and/or technology-based resources (e.g., virtual remote laboratories).

The questions we want to address in this round table (RT) are:

- (a) how sustainable those innovations are, even after the end of the financing period? and
- (b) What factors may (or may not) increase this sustainability, in particular what can be done during the implementation of the projects to ensure it?

## Speakers

In order to have replies to these questions, four coordinators of financed projects (see project titles below) had been invited to participate in this RT.

The main aim of this roundtable is to obtain and discuss perspectives and evidences, from the “voice” of the project coordinator invited, about the questions raised above. For this propose each coordinator should present

- (a) a brief summary of the project, focusing on the innovation developed, and
- (b) his/her point of view about the questions addressed in the RT.

Following these interventions, time will be given for questions from the International Seminar (IS) audience (15 min).

A reply, from each coordination project, will then be given. A brief summary of the RT will be given to all the IS participants, during lunch time, from the responsibility of the RT moderator.

## Round Table Moderator Biography



**Nilza Costa** is a full Professor at the Department of Education and Psychology of the University of Aveiro (Portugal). Her main research interests are in Teacher Education, Assessment and Evaluation.

She has expertise as coordinator of the Research Centre “Didactics and Technology in the Education of Trainers”, CIDTFF, from 2012 to 2016, and as the Coordinator of the Laboratory for Supervision and Evaluation (Lab\_SuA) of the CIDTFF.

She has been involved in several national and international projects, both as a researcher and coordinator (e.g. Coordinator of the Tempus Project “Teacher Education Review and Update of Curriculum” – TERC; Reference: 511063-TEMPUS-1-2010-1-PT-TEMPUS-JPCR, 2010-14). She is author and co-author of several publications in national and international journals and a reviewer of scientific journals.

## Round Table Speakers Biographies



**Celina Pinto Leão**, PhD in Engineering Science from Faculty of Engineering of the University of Porto, Portugal, presently at School of Engineering of University of Minho, Portugal, as an Assistant Professor.

The research work in the R&D Centro Algoritmi focuses her main scientific interests in numerical and statistical methods in engineering and in the application of new methodologies in the learning process of numerical methods and statistics in engineering.

Member and/or PI of international and national competitive funded research projects across several domains, with a special emphasis to the domain of Policies of Higher Education and Science. Recently, new areas of interest namely the use of statistics for decision making and gender studies in engineering.



**Filomena O. Soares** received her degree in Chemical Engineering in 1986 at Porto University, Portugal. In 1997, she obtained her PhD in Chemical Engineering at the same University. Since 1992 she works in the Industrial Electronics Department Minho University and she develops her research work in R&D Algoritmi Centre.

Her main scientific interests are in the areas of System Modeling and Control, with application to bioprocesses and in Biomedical Engineering Science. Motor and cognitive rehabilitation has been receiving her attention, using serious games and robots to foster the communication with impaired children/adults. She is interested in new teaching/learning methodologies, in particular blended-learning and virtual and remote laboratories.

## Speakers

She supervised several Msc and PhD thesis and was co-author of several scientific articles in international conferences and journals



**Isabel Cristina Gonçalves** graduated at the Faculdade de Psicologia (Psychology Faculty) of Universidade de Lisboa (University of Lisbon) in 1989, in the field of Psychotherapy and Counseling.

In 2001, she completed her training as a Psychotherapist at the Associação Portuguesa de Psicoterapia Comportamental e Cognitiva – APTCC (Portuguese Association of Behavioral and Cognitive Psychotherapy), with a thesis entitled “Psychological Counseling Services at the University context – the role of Cognitive-Behavioral Therapy”.

She holds the advanced specialties of Psychotherapy and Psychological Coaching, certified by the Portuguese Psychologists’ Association (Ordem dos Psicólogos Portugueses – OPP). She was a founding member of the Professional Association “Rede de Serviços de Aconselhamento Psicológico no Ensino Superior” (Network of Psychological Counseling Services in Higher Education), and she implemented and coordinated the Serviço de Apoio Psicológico (Psychological Support Service) at the Instituto Superior Técnico, between 1993 and 2006. She was the Committee Chairwoman of the OPP’s Internships from 2011 to 2014.

Isabel is also a Specialist in Educational Psychology (OPP). She founded (in 2005) and coordinates up to today the Núcleo de Desenvolvimento Académico (*Academic Development Center*) at Instituto Superior Técnico (before called Gabinete de Apoio ao Tutorado – *Support to Mentoring Office*).



She has published several works in her fields of interest, and she has participated in many national and international research projects. Isabel is taking her PhD at the Faculdade de Psicologia of Universidade de Lisboa (University of Lisbon Psychology Faculty).



**João Pedro Pêgo** was born in Porto in 1977 Degree in Civil Engineering, at FEUP, in 2000 Obtained the degree of Doktor der Ingenieurwissenschaften by the University of Erlangen-Nürnberg, Germany, in 2007.

Has developed scientific activity in the field of Hydraulics, in particular, in the areas of river flows and WRM . In his field of research, he has several articles published in international journals with peer review and has been involved in several national and European projects, both as a researcher and as a principal investigator.

He has also been active in research in the area of Pedagogy of Higher Education, in close collaboration with FPCEUP. Coordinates 4 doctoral dissertations and coordinated 7 master dissertations.



**José Manuel Martins Ferreira** obtained his BSc (1982), MSc (1987) and PhD (1992) in Electrical and Computer Engineering at the University of Porto. His lecturing interests are centred in digital electronics design and test. He worked in part-time at Texas Instruments in 1982 and 1983, and at Efacec in 1985. He was a researcher at INESC (Instituto de Engenharia de Sistemas e Computadores) between 1988 and 1997.

From July of 2010 to August of 2013 he was the vice-president for academic affairs at the Faculty of Engineering of the University of Porto. He was vice-rector of the University of Porto from July 2014 to June 2018,

## Speakers

where he was responsible for information management, educational technologies, quality and continuous improvement. Since September of 2013 he is Professor in Digital Electronics at the Faculty of Technology, Natural Sciences and Maritime Sciences, University of South-Eastern Norway in Kongsberg (position held in leave of absence while being vice-rector at U.Porto).



**Vitor H. Carvalho** received in 2008 his PhD in degree in industrial electronics, in the option of industrial informatics. He is currently working as associate (tenured) professor at the Polytechnic Institute of Cávado and Ave (IPCA),

Barcelos, Portugal as well as integrated researcher of the Applied Artificial Intelligence Laboratory at IPCA and collaborator of the Algoritmi Research Centre at Minho University. He is also the Head of the School of Technology at IPCA and President of the Pedagogical Council at the School of Technology (IPCA).

His main fields of interest are related with data acquisition systems, serious games and machine learning.

**Lecture:**

**“How do we prepare today’s higher education students for tomorrow’s challenges? Teacher education and the promotion of ‘21st century skills”**

Amanda Franco  
Department of Education and Psychology  
CIDTFF  
University of Aveiro  
Portugal  
afranco@ua.pt

**Abstract**

There are 10 major skills that should be evident in Portuguese students by the end of compulsory education, says the 2017 Report *Students’ Profile at the End of Compulsory Education* (Ministry of Education), following European guidelines that appeal to the development of “21st century skills”. One of such is Critical Thinking, which is comprised of a set of abilities and dispositions, a knowledge base, and thinking criteria. A critical thinker is curious, deliberate, flexible, and persistent, remaining modest about her/his thinking, knowledge, self, and others; at the same time, she/he is prone to reflect, argument, and dialogue, as well as to search, identify, interpret, analyze, evaluate, infer, and explain information. Critical Thinking is identified as essential in the academic context, with its importance along schooling (from elementary and secondary to higher education) becoming clearer in the eight reference levels of education-training in the *European Qualifications Framework*. Nonetheless,

## Speakers

Critical Thinking must be developed deliberately, explicitly, and systematically in class, in order to flourish. Here, teacher education that is inclusive of Critical Thinking is essential, so teachers learn which pedagogic practices are oriented to the promotion of Critical Thinking, and how to create opportunities in class for their students to become critical thinkers. If we aim to promote 21st century skills, in order to prepare today's higher education students for tomorrow's challenges, teacher education that is both open to and deliberate about Critical Thinking is essential.

### Keynote Speaker Biography



**Amanda Franco**, Holder of a Master's Degree in School and Educational Psychology (Universidade do Minho: Braga, Portugal), and a PhD in Science of Education, in the specialty area of Educational Psychology (Universidade do Minho: Braga, Portugal), with a fellowship granted by Fundação para a Ciência e a Tecnologia (SFRH/BPD/122162/2016).

She has professional experience as a school psychologist. Currently, she is a Postdoctoral Researcher in Science of Education, with a fellowship granted by Fundação para a Ciência e a Tecnologia, at Centro de Investigação Didática e Tecnologia na Formação de Formadores - CIDTFF (Didactics and Technology in Teachers' Education Research Center), at Universidade de Aveiro (Aveiro, Portugal), with a project entitled "O pensamento crítico e a formação universitária: Impactes no estudante e seu desempenho académico" (Critical thinking and college training: Impacts on students and their academic performance).

**Lecture:**

**“Pathways to change in teaching and learning at the University of Aveiro: notes from 8 years of experience”**

Gillian Moreira  
Department of Languages and Cultures  
University of Aveiro  
Portugal  
gillian@ua.pt

**Abstract**

Higher Education Institutions (HEI) are under significant pressure to adjust their academic practices to meet the needs and expectations of increasingly diverse student populations while simultaneously confronting new social demands, tackling global challenges, keeping up with evolving digital technologies and preparing for the impact of the 4th industrial revolution. In a rapidly changing world, past certainties regarding future life paths and professional opportunities no longer apply, and HEI are urged to change and adapt or risk becoming irrelevant. This pressure comes from several quarters: from inside (students, staff, senior management), and from outside (national and international bodies, accreditation agencies, employers and professional associations, families).

In this context, attention has refocused on teaching and learning, with emphasis on pedagogical and curricular innovation, enhanced permeability with society, business and industry, and greater transparency and accountability regarding the student experience, in particular: student satisfaction, success

## Speakers

and employability. This paper will address these issues with reference to the University of Aveiro (UA) and the paths it has followed in recent years in pursuit of continuing excellence in teaching and learning, and to my experience as pro-rector over an 8-year period. Particular reference will be made to aspects of this experience shared with colleagues, in UA and other institutions, in what was, in effect, an intense and collaborative learning experience.

### Keynote Speaker Biography



**Gillian Moreira** is Assistant Professor at the University of Aveiro, Portugal. She holds a Masters in Education and a Doctorate in Culture from this university, having specialised in the cultural relations between the European Union and the United Kingdom, and she teaches in the area of Cultural and Intercultural Studies at the Department of Languages and Cultures.

She is a researcher at the Centre for Languages, Literatures and Cultures at UA and her research has focussed on language education and language policies, interculturality and identity issues, and intercultural competence in contexts of personal and professional mobility. She has participated in conferences and published on these themes, and been involved in national and international projects related to English Language education, the development of plurilingual and intercultural competences and quality enhancement in higher education.

She was pro-Rector at the University of Aveiro (2010 – 2018) with responsibility for the evaluation and accreditation of the study programs and the enhancement of the teaching and learning experience of students at UA.

**Poster presentation:  
"My project in higher education in 5 minutes!"**

Mónica Seabra  
Department of Education and Psychology  
CIDTFF  
University of Aveiro  
Portugal  
monicaseabra@ua.pt

**Abstract**

At the IAPHE'18, there will be a moment for the presentation of posters, each one concerning an ongoing research project in the context of higher education. A total of 10 posters were accepted for presentation, in a multiplicity of areas as unique as the implementation of a training program for both students and teachers in the field of linguistic and cultural diversity; the implementation of a system to assess the quality of teaching-learning processes in the field of engineering; a project to increase citizens' scientific literacy about monumental trees; mapping of innovational means to support self-oriented learning of qualitative data analysis software - just to name a few.

Despite their idiosyncrasies, all posters seem to share a few common ideas, such as interdisciplinarity, multiculturalism, collaboration, and inclusion. The authors will briefly "pitch" their posters during the IAPHE'18, in the session "My project in higher education in 5 minutes!". Prior to this

## Speakers

session, all 10 poster authors will be offered the opportunity to participate in a one-day training course hosted by the CIDTFF, *COMMUNICATING SCIENCE IN PUBLIC - WHEN THE AUDIENCE SAYS "WOW"*, conducted by two specialized trainers, to help them prepare their pitch in a clear, motivating way for the general public. Overall, it is expected that this session, as well as the training course that precedes it, helps to precipitate a lasting collaborative network among all participants in the IAPHE'18!

### Pitch moderator Biography



**Mónica Seabra** is a PhD student of the Doctoral Program in Education and holds a doctoral fellowship by the Foundation for Science and Technology (SFRH/BD/121350/2016). She holds a Master's degree (2014) and a degree (2012) in Basic Education with professional experience, in the field. Mónica is a member of the Research Center Didactics and Technology in the Education of Trainers (CIDTFF).



**Round table:**  
**“Building the future of higher education: an agenda for research sustainability”**

Rui Marques Vieira  
Department of Education and Psychology  
CIDTFF  
University of Aveiro  
Portugal  
rvieira@ua.pt

**Abstract**

One main purpose of this round table is to reflect on the policies and strategies that are necessary to establish an agenda aimed at fostering the sustainability of research and innovation in the higher education context.

The specific questions we want to address in this round table are:

- I) How to develop a political agenda for educational research in higher education context?; and
- II) Which strategies should be included in a political agenda for educational research in higher education context?

Each Speaker will have 10 minutes to answer these questions. Each Speaker will present a brief summary, from his/her point of view, about the strategies to develop the agenda for next in his/her institution/community. Following these interventions, time will be given for questions from the International Seminar audience (15 min). A reply from each round table speaker will then be given.

## Speakers

### Round Table Moderator Biography



**Rui M. Vieira** is Doctor in Didactics and has been teaching in this University (Department of Education and Psychology - DEP), since 2004 where he teaches courses in initial and post-graduation in teacher education, like "Didactic of Sciences", which includes TIC in Science Education.

He has been involved in several national (more than 10) and international projects. He has tutored more than 50 MsC students and 10 PhD students. Published 10 books, more than 100 papers in conferences / congress at national and international level. Developed several educational resources and patented some of them, such as the Courseware SERe - The Human Being and Natural Resources, with other five colleagues.

### Round Table Speakers Biographies



**Antonio Teixeira** got his PhD from university of Aveiro in 1999, partly developed at the University of Rochester. He holds an EC in management and leadership from MIT Sloan School and a post-graduation in quality management in the field of Higher Education. He has been a professor at the University of Aveiro from 1999, being actually Associate professor with Aggregation. He has worked from 2009-13 in Nokia Siemens Networks and in Coriant (2013/14) as a standardization expert in the field of optical access (In FSAN, ITU-T, IEEE 802.3). From 2014, he is the Dean of the University of Aveiro Doctoral School aggregating 50 PhD programs and 1300 students. He has published more than 400 papers (more than 130 in journals), has edited a book and contributed to several other. Holds 11 patents, and tutored successfully more than 70 MsC's

and 14 PhD's, having participated in more than 35 projects (national, European and international). In 2014 he co-founded PICadvanced, a startup focused on providing solutions based on optical assemblies targeting biotech and optical networking (including access networks). He has served the ECOC TPC from 2008-15 in the SC for subsystems, having chaired it in 2010/11/15. He has served the access subcommittee in OFC from 2011-14, and has been General Chair of ICTON 09, Networks 2014. He is a Senior Member of OSA and a member of IEEE and IEEE standards association.



**Heitor Alvelos** is professor of Design and New Media at the University of Porto. Director of the PhD Program in Design (U.Porto / U.Aveiro/ UPTEC / ID+). Director, on behalf of U.Porto, of the Institute for Research in Design, Media and Culture / Unexpected Media Lab.

Chair of the Scientific Board (HSS) at the Foundation for Science and Technology (2016-present, member since 2010). Curator, FuturePlaces medialab for citizenship, since 2008.

Outreach Director of the UTAustin-Portugal Program for Digital Media (2010-2014). Member, Academia Europaea. Member, Executive Board, European Academy of Design. Advisory Board Member for Digital Communities, Prix Ars Electronica.

Since 2000, Heitor develops audiovisual work with Touch, Cronica Electronica, Ash International and Tapeworm. He is the Ambassador in Portugal of the KREV project since 2001. Projects include Autodigest (since 2002), 3-33.me (since 2012) and Antifluffy (since 2013).

Current research interests include the lexical implications of new media, the ecology of perception, and cultural criminology.

## Speakers



**Isabel Menezes** has a PhD in Psychology and a Habilitation in Educational Sciences at the University of Porto, where she works as a Professor at the Department of Educational Sciences.

She has been teaching in the fields of educational research, educational and community intervention, citizenship education and political psychology.

She coordinates research projects on children, youth and adult civic and political participation, with a special focus on the experience of groups at risk of exclusion on the basis of gender, social class, sexual orientation, migrant status, ethnicity, literacy, disability and chronic disease. She has been involved in several European and international projects related to citizenship education and youth civic and political participation; more recently, her research also deals with doctoral education and an ecological-situated view on university social responsibility.

She is currently the Director of the Doctoral Program of Education at the University of Porto, and the President of the Portuguese Educational Research Association (SPCE).



**Jorge Manuel Bastos Brandão** was born in Coimbra on February 16, 1965. He is graduated in Geography (1987) and holds a Master's degree in Regional Geography (1993) from the Faculty of Arts Humanities of the University of Coimbra. Since 1987 he has been working in the Centro Regional Coordination and Development Commission (CCDRC) in the areas of regional development and international cooperation. He is Member of the Board of the Regional Operational Program (CENTRO 2020).

## Posters

- 01. A project for Higher education innovation  
In science and mathematics**  
Bento Cavadas, Elisabete Linhares, Marisa Correira,  
Nelson Mestrinho & Raquel Santos
- 02. Kamishibai plurilingue:  
um recurso para abordar a diversidade linguística e cultural  
nas escolas portuguesas**  
Rosa Maria Faneca & Maria Helena Araújo e Sá
- 03. Evaluation of the quality of teaching and learning for 1st year  
engineering programmes – an initial contribution.  
The case of the University of Aveiro, Portugal**  
Carla Ferreira, Margarida Pinho-Lopes & Isabel Huet
- 04. Preocupações Associadas à Aprendizagem de QDAS**  
Fábio Freitas, Francislê Neri de Souza & António Pedro Costa
- 05. Árvores Monumentais de Portugal:  
da compreensão pública a uma literacia científica**  
Raques Pires Lopes, Catarina Schreck Reis & Paulo Renato Trincão
- 06. Educating teachers for global citizenship:  
Exploring the potential of “third space”**  
Mónica Lourenço & Ana Isabel Andrade
- 07. Investigação e supervisão intercultural  
nos Programas Doutorais da UA**  
Susana Pinto & Maria Helena Araújo e Sá
- 08. Inclusão no Ensino Superior:  
processos que visam intervir para potenciar a inclusão de  
estudantes com NEE**  
Evelyn Santos, Paula Vagos & Dayse Neri de Souza

**09. Cenário Ubíquos e a Ciência participativa: para ensinar e aprender**

Karine Pinheiro de Souza

**10. Towards Excellence in Engineering Education. Alignment of expectations about the profile of Teachers**

António Andrade-Campos, Bárbara Gabriel, Gillian Owen Moreira,  
João Dias-de-Oliveira, Robertt Valente & Victor Neto



# A PROJECT FOR HIGHER EDUCATION INNOVATION IN SCIENCE AND MATHEMATICS



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<sup>1</sup>School of Education, Polytechnic Institute of Santarém, Portugal  
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## Introduction

**CreativeLab\_Sci&Math**® is a project of the teachers of the Department of Mathematics and Natural Sciences of Polytechnic Institute of Santarém/School of Education. This project focuses in higher education innovation for teaching, learning and assessment in Science and Mathematics (S&M).

The CreativeLab\_Sci&Math® is based on the following academic practices:

### 1 Use of the 7E instructional model and Inquiry-Based Learning

**Immersion** in this type of **teaching-learning scenarios** prepare prospective teachers with inquiry-based learning approaches, and actively participate in solving social issues related to science, technology and environment (Linhares & Reis, 2017).

**Inquiry-based learning activities** allow students to describe objects, raise questions, construct and evaluate explanations, considering current scientific knowledge and communicating their ideas (Pedaste et al., 2015).



### 2 Working in innovative educational environments

CreativeLab\_Sci&Math® has a **spatial organization**, inspired by the initiative *Future Classroom Lab* (European Schoolnet, 2017), with **different learning areas**. These areas were designed to promote diverse teaching strategies and new teachers' and students' roles (OECD, 2013). The areas are related to the 7E teaching moments and promote skills associated to mathematics and science.

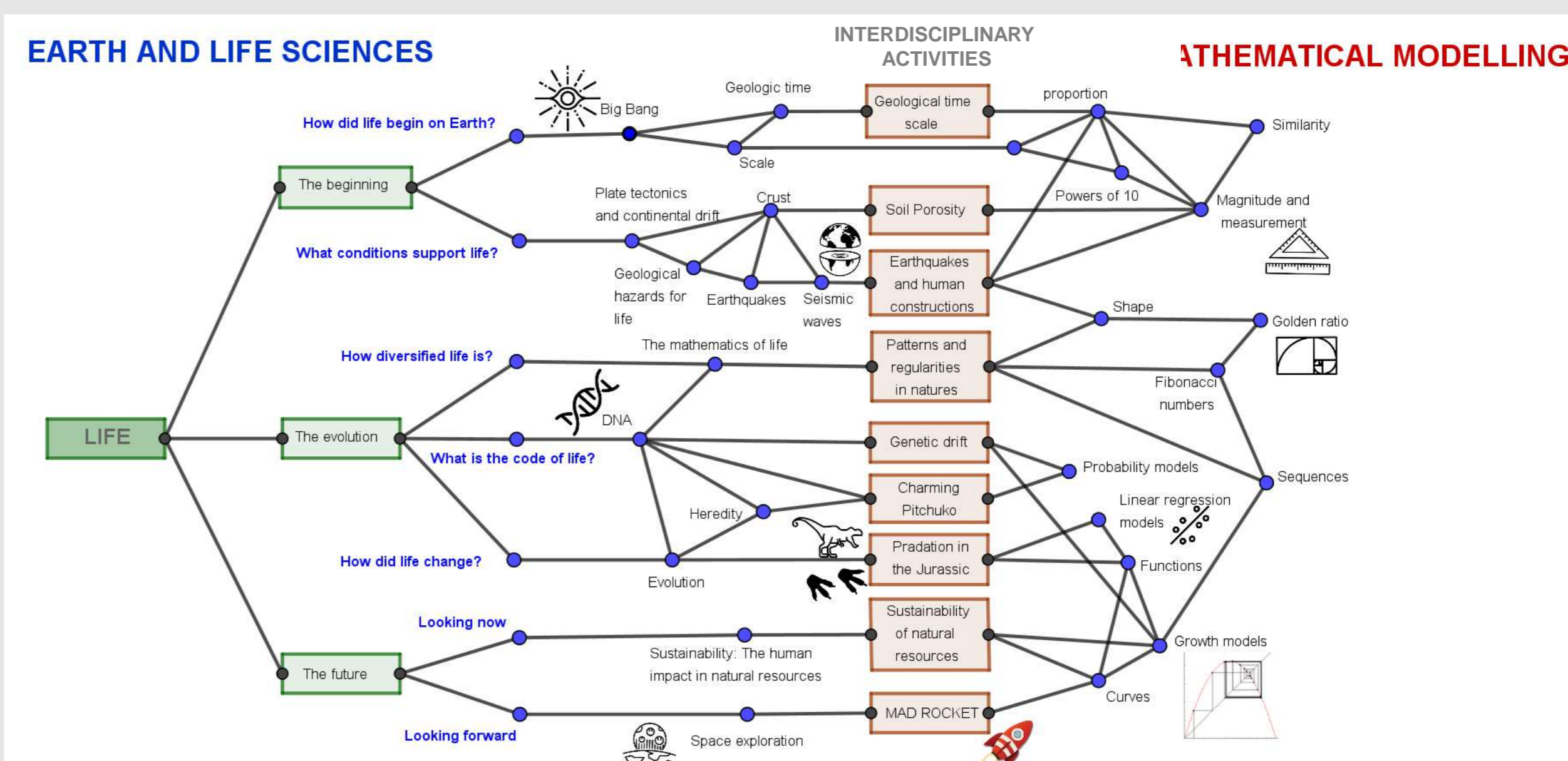


### 3 Interdisciplinarity and co-teaching

Prepare citizens to be able to **integrate knowledge** from multiple areas (Zhang & Shen, 2015), specifically, the integration of S&M teaching and learning (AAAS, 2011; Czerniak, 2007) is an educative major outcome. **Interdisciplinarity (ID)** could contribute to this outcome because promotes student learning, engagement, problem-solving skills, critical thinking, real-life application (Riordáin, Johnston & Walshe, 2016), and better understanding of S&M. **ID collaboration** also improves teachers' development of pedagogical and content knowledge (Frykholm & Glasson, 2005; Morrison & McDuffie, 2009). Creating an **ID syllabus** is a challenging task (Lyll, Meagher, bandola & Kettle, 2015). However, a solution to improve the performance of the students in S&M is combine them into **one field of study** (Hollenbeck, 2007). Feistel and Maestrelli (2012) also said that interdisciplinarity could be intended as a relation of knowledge between different subjects.

Therefore, ID is a key feature of our project and involves:

- **Co-teaching**: these activities are implemented with two teachers sharing responsibilities as joint planning, instruction, and evaluation of learning experience.
- **Co-creation**: definition of **learning goals and specific learning outcomes** of common S&M activities and resources; CreativeLab\_Sci&Math® teachers also crossed the syllabus of the curricular units of Earth and Life Sciences and Mathematical Modelling (Basic Education Degree) into a **curricular interdisciplinary network** with common activities.



### 4 Disseminate educational innovation and share S&M activities

Our **open educational resources** (designed for students from kindergarten to high school) are shared in online platforms for science and mathematics teachers, with peer review, as **Casa das Ciências**® (House of Sciences).

Some of our activities were awarded with **annual prizes** that distinguishes the best activities published by teachers in Portugal.

Other shared activities were **elaborated by students**. We think involving our students in the process of design, implement and share science and mathematics activities for different school levels contributes to their formation as future teachers.

Find more on our **web page**.

Join us on **Facebook**®



### Future challenges

- Create sustainability for curricular innovation in S&M within our higher education institution;
- Improve the dynamics of co-creation and co-teaching;
- Develop a collaborative network with national and international researchers interested in higher education innovation in S&M.

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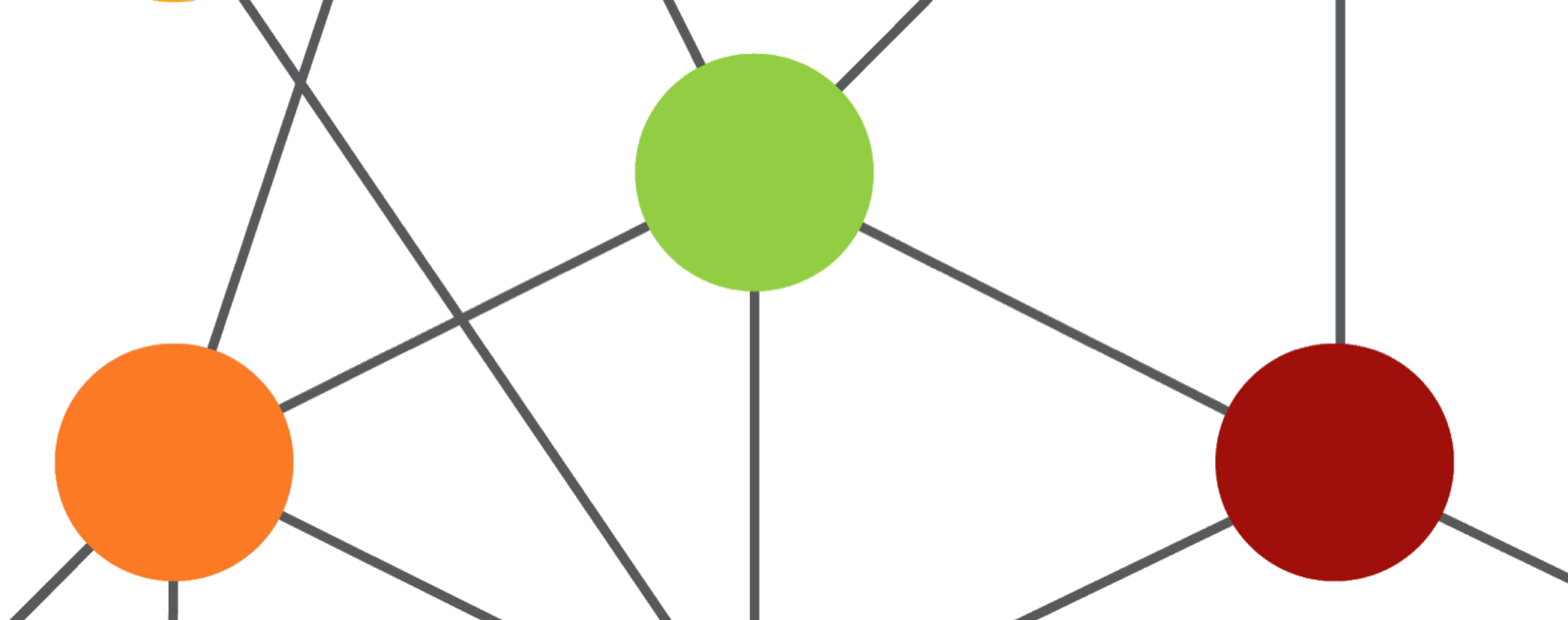




# IAPHE'18

Innovative Academic Practices  
in Higher Education

How to make them more sustainable



## Kamishibai plurilingue: um recurso para abordar a diversidade linguística e cultural nas escolas portuguesas

Rosa Maria Faneca & Maria Helena Araújo e Sá  
CIDTFF, Universidade de Aveiro (Portugal)

### Resumo

O projeto aqui apresentado visa: i) constituir um grupo de estudantes universitários e professores, numa parceria investigação-prática, interessados em trabalhar com abordagens plurais em Didática de Línguas com recurso ao *kamishibai* plurilingue, mobilizando a rede de parceiros escolares do CIDTFF (escolas protocoladas no âmbito da PPS e CIEC de Vila Nova da Barquinha); ii) conceber, implementar e avaliar uma formação para estudantes universitários e professores, numa parceria investigação-prática com os objetivos de promover uma abordagem plurilingue e intercultural, integradora, flexível e reflexiva nas suas práticas pedagógicas, com recurso ao *kamishibai*. Neste âmbito, serão recolhidos dados de questionários aplicados aos estudantes universitários e professores, numa parceria investigação-prática, que permitam avaliar a formação. Após a formação, as turmas construirão um *kamishibai* plurilingue que concorrerá no 1.º concurso nacional “*Kamishibai plurilingue*”. O *kamishibai* vencedor irá participar no concurso internacional organizado pela associação francesa DULALA. Após esta fase, serão recolhidos dados a partir dos diários de bordo dos professores participantes para analisar as potencialidades, constrangimentos e possibilidades de inclusão deste recurso na formação inicial e contínua de professores.

### Enquadramento

Num país cada vez mais marcado por movimentos migratórios como Portugal, é fundamental repensar e intervir na formação (inicial/contínua) de professores, ainda a braços com práticas de formação orientadas para uma escola tendencialmente homogénea e monolíngue [1]. Considerando estes desafios, o projeto integra uma comunidade internacional que trabalha as abordagens plurais com recurso ao *Kamishibai* (Associação Dulala/ Kamilala) [2, 3] à volta de um projeto comum, o concurso *kamishibai* plurilingue (Fig. 1 e Fig. 2).

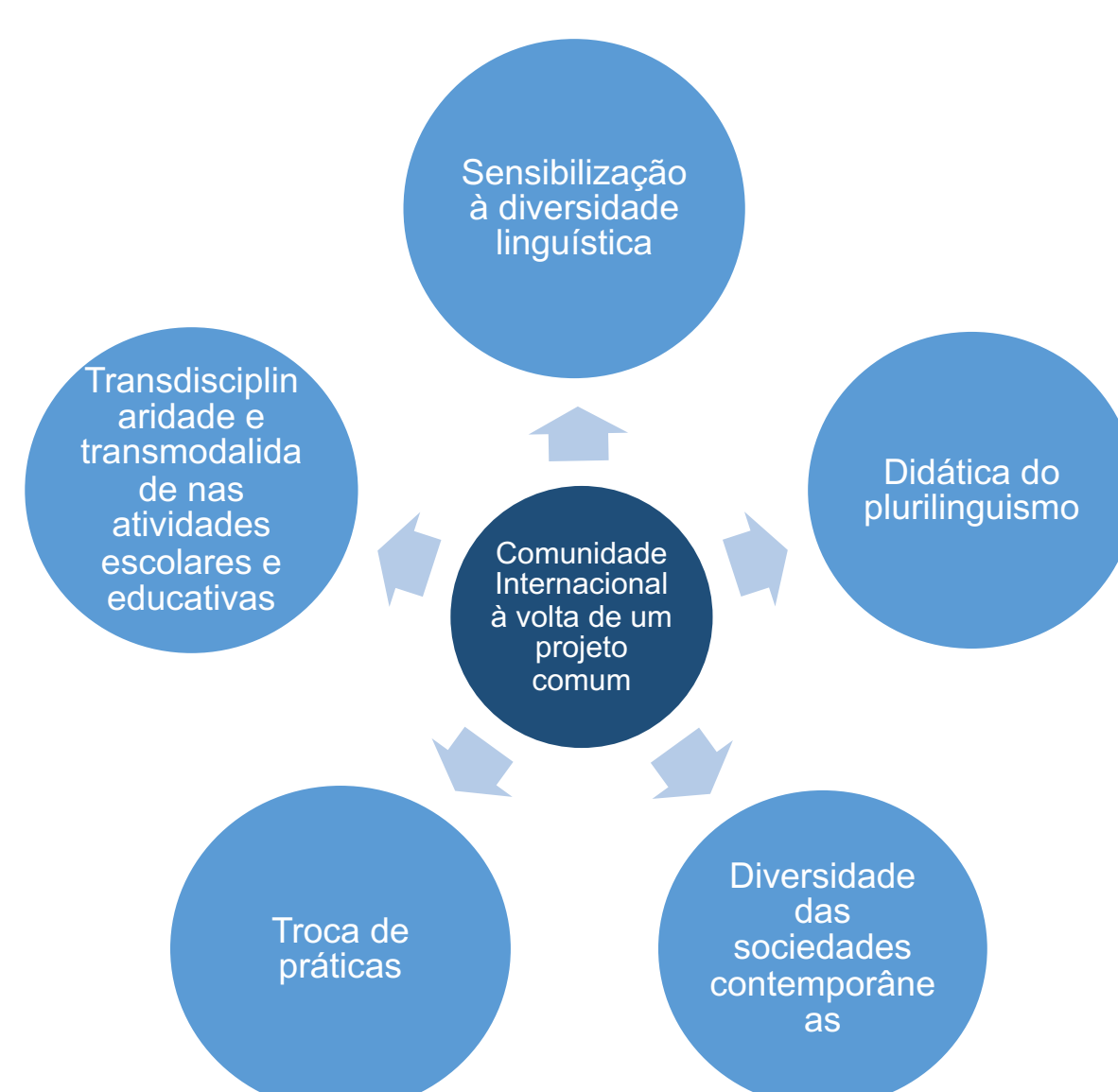


Fig. 1 – Abordagem do projeto



Fig. 2 – Kamishibai plurilingue

### Questões de investigação

1. Qual o papel do *kamishibai* plurilingue numa educação orientada para a diversidade (linguística e cultural e a convivência) em contexto escolar?
2. Quais as potencialidades e constrangimentos do recurso didático em contexto educativo (1.º CEB)?

### Objetivos do projeto pedagógico e plurilingue *Kamishibai*

1. Conceber, implementar e avaliar uma formação para professores/ futuros professores do 1.º CEB
2. Construir, colaborativamente, com alunos e professores, os *kamishibais*, com o objetivo de despertar as crianças para as línguas, integrar a diversidade linguística e cultural e desenvolver estratégias de aprendizagem;
3. Organizar o 1.º concurso *kamishibai* plurilingue nacional, a partir do tema escolhido pela rede internacional kamilala (“Da minha janela para o mundo”);
4. Participar no concurso *kamishibai* plurilingue internacional com o *kamishibai* vencedor do concurso nacional;
5. Analisar, compreender e avaliar as potencialidades e constrangimentos deste recurso didático no contexto escolar português e disseminar os resultados.

### Metodologia

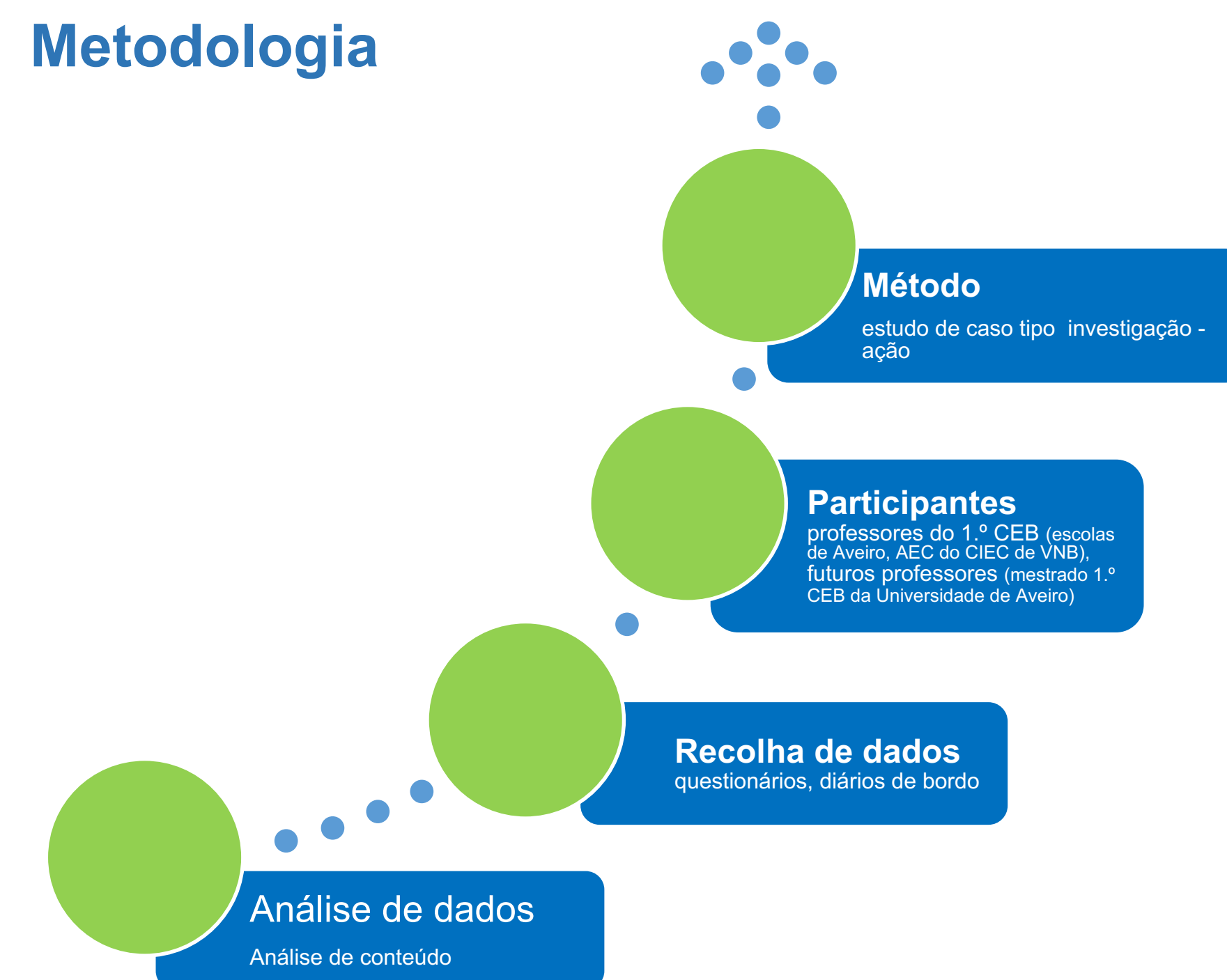


Fig. 3 – Metodologia da investigação

### Resultados esperados

- ✓ Organização do 1.º concurso *kamishibai* nacional.
- ✓ Edição do *Kamishibai* plurilingue vencedor do concurso (Fig. 4).
- ✓ Recomendações para a inclusão deste recurso na formação inicial e contínua de professores.



Fig. 4 – Edição de *Kamishibais* plurilingues

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DULALA Langues, Education, Diversité

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# IAPHE'18

Innovative Academic Practices  
in Higher Education

How to make them more sustainable

## Evaluation of the quality of teaching and learning for 1<sup>st</sup> year engineering programmes – an initial contribution

The case of the University of Aveiro, Portugal

Carla Ferreira\*, Margarida Pinho-Lopes\*\* & Isabel Huet\*\*\*

\*G13 University of Aveiro, CIDTFF (Lab\_SuA)

\*\*University of Southampton, United Kingdom

\*\*\*University of West London, United Kingdom

### Abstract

A system for evaluating the quality of teaching and learning implemented at the University of Aveiro is briefly described. Data for five modules on the 1<sup>st</sup> year engineering programmes was collected (using questionnaires and reports filled in by students and teachers) and analysed using quantitative and qualitative approaches. The “strengths” and “weaknesses” emerging from the data were discussed. Both teachers and students showed a reflective attitude by focusing on their different roles in the teaching and learning processes.

### WHY was it relevant?

- Problem: **high dropout rates and unsatisfactory academic performance** in higher education, particularly within **engineering** [3].
- **Causes for dropout** of engineering programmes: factors related to the student; pedagogical approaches adopted; inherent competitiveness and focusing on marks, rather than learning.
- **Quality in higher education**: combine ‘a vision centred on input (putting stress on the quality of staff recruitment, the resources given to teaching and university success) with a knowledge-based approach with regard to the needs of society’ [2].

### WHAT was the purpose?

- Focuses on the evaluation of quality of teaching and learning for **1<sup>st</sup> engineering programmes** at the University of Aveiro.
- Data for **5 modules** on those programmes was collected and ‘**strengths**’ and ‘**weaknesses**’ emerging from the data, identified by students and teachers, are identified and discussed.
- A quantitative and a qualitative studies were included.

### RESEARCH questions?

- How do the teachers and students perceive the quality of teaching and learning processes in engineering programmes?
- What are the ‘strengths’ and the ‘weaknesses’ identified by teachers and students?

### HOW was it conducted?

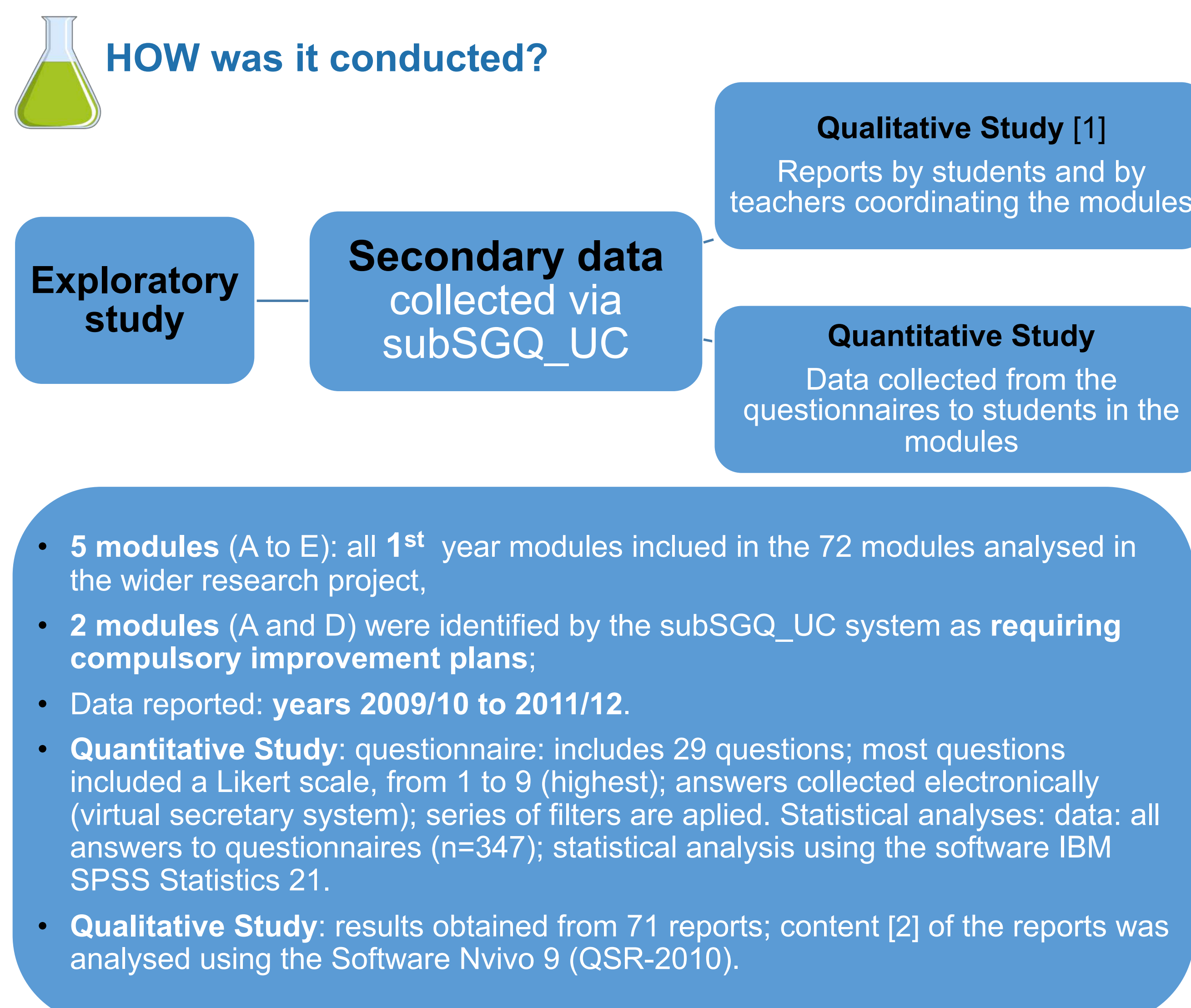


Fig. 1 – Methodology

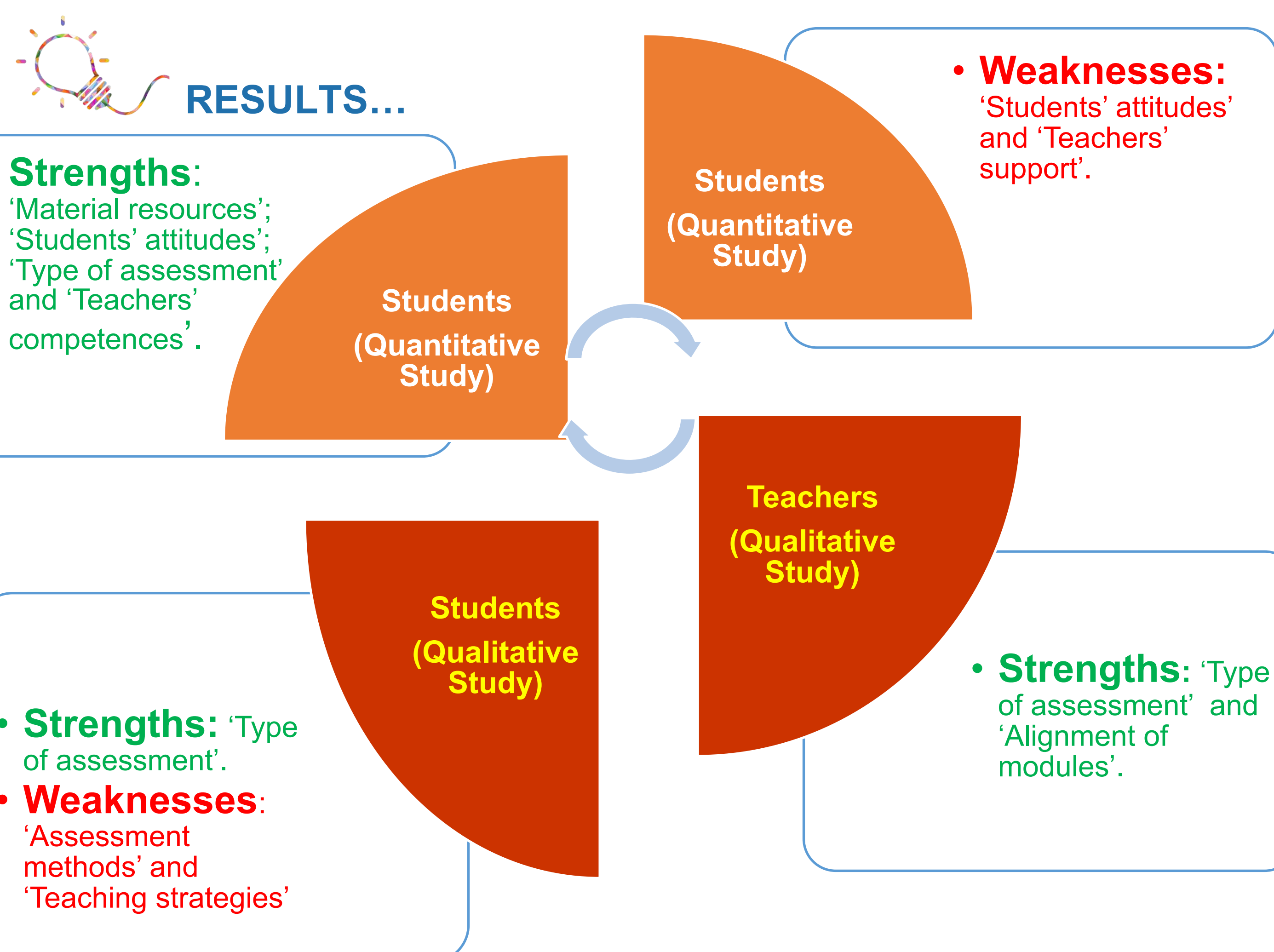


Fig. 2 – Results

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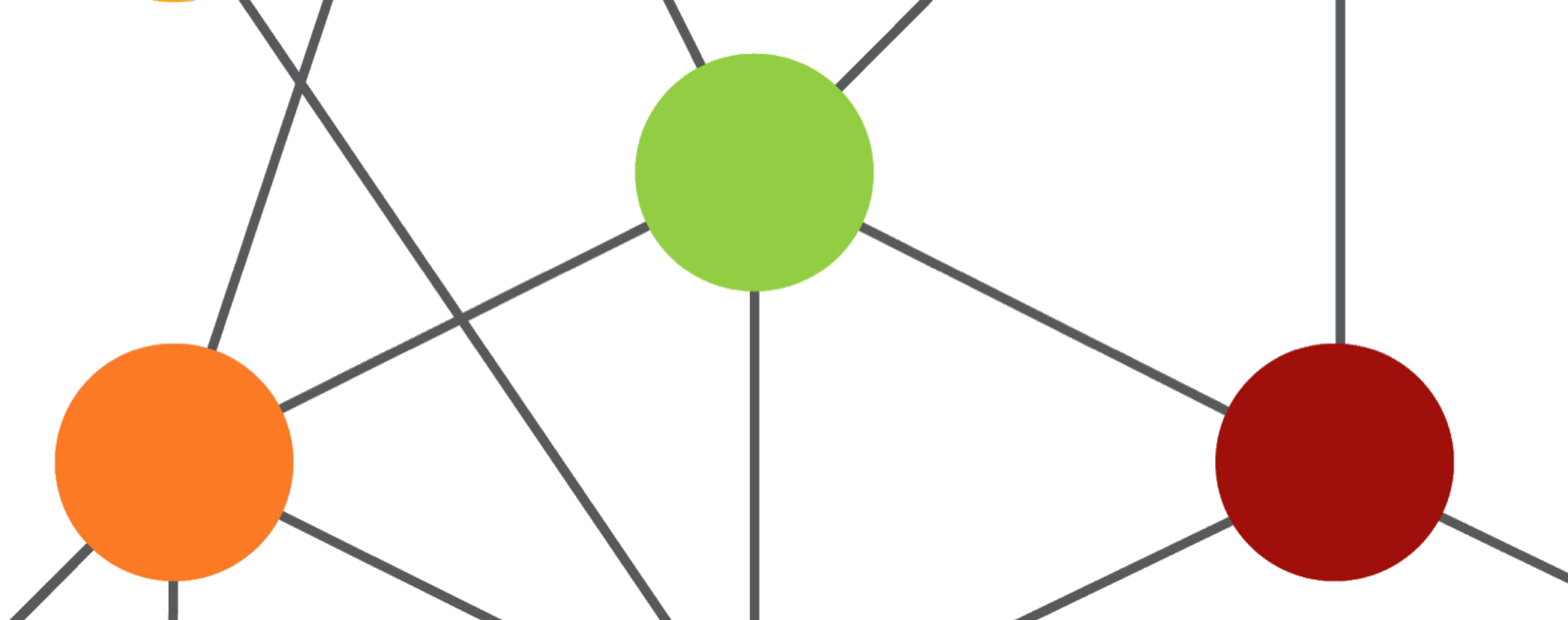




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## “Como é que”...

### Preocupações Associadas à Aprendizagem de QDAS

Fábio Freitas, Francislê Neri de Souza, António Pedro Costa  
GI3, Laboratório de Conteúdos Digitais (LCD), Universidade de Aveiro

#### Resumo

Muitos dos atuais desenvolvimentos investigativos, relacionados com práticas inovadoras no ensino superior, são suportadas por financiamentos públicos. Tal facto pode implicar dois compromissos por parte dos dos investigadores: a prática de princípios de Ciência Aberta [1], bem como a sustentabilidade da própria investigação[2]. Por seu lado, essa sustentabilidade pode levantar preocupações relacionadas com vários fatores, entre os quais, económicos, gestão do tempo ou de competências técnicas. Assim, os dados apresentados neste poster fazem parte de um questionário (desenvolvido na plataforma Google Forms®), validado por pares, e que foi desenvolvido no âmbito de um projeto de doutoramento, relacionado com o desenvolvimento de meios inovadores de apoio à autoaprendizagem de pacotes de *software* de análise de dados qualitativos (QDAS).

Pretende-se com este poster refletir sobre os níveis e dimensões de algumas das preocupações dos utilizadores relacionadas com a aprendizagem deste tipo de pacotes. Estes dados procuram estimular à reflexão relativa à forma como estes fatores podem, ou não, condicionar a sustentabilidade do nosso processo de análise de dados qualitativos.

#### Desafios dos Pacotes de Análise de Dados Qualitativos (QDAS)

As investigações de Natureza Qualitativa acarretam muitas exigências e desafios aos investigadores, essencialmente no que respeita à organização e análise dos dados recolhidos. Realiza-lo manualmente torna o processo impreciso, complexo, exigente em tempo, o que se traduz num desgaste para o investigador [3]. Porém o recurso a *software* pode proporcionar desafios com implicações seja para os investigadores como também para os orientadores [4, 5]. Tais desafios podem-se tornar desmotivadores e até mesmo insustentáveis para o investigador. Desde logo porque:

- Requerem um elevado conhecimento técnico e metodológico por parte do investigador;
- Exigem disponibilidade de tempo para a aprendizagem do *software*;
- Necessitam de ferramentas de aprendizagem adaptadas ao estilo de aprendizagem do utilizador.

#### Algumas das preocupações dos Utilizadores no processo de aprendizagem dos QDAS

No âmbito de um questionário online, aplicado a cerca de 221 utilizadores de diversos pacotes de QDAS, espalhados em várias partes do mundo, foi possível constatar os seguintes níveis de preocupação relacionado com o processo de aprendizagem de QDAS.

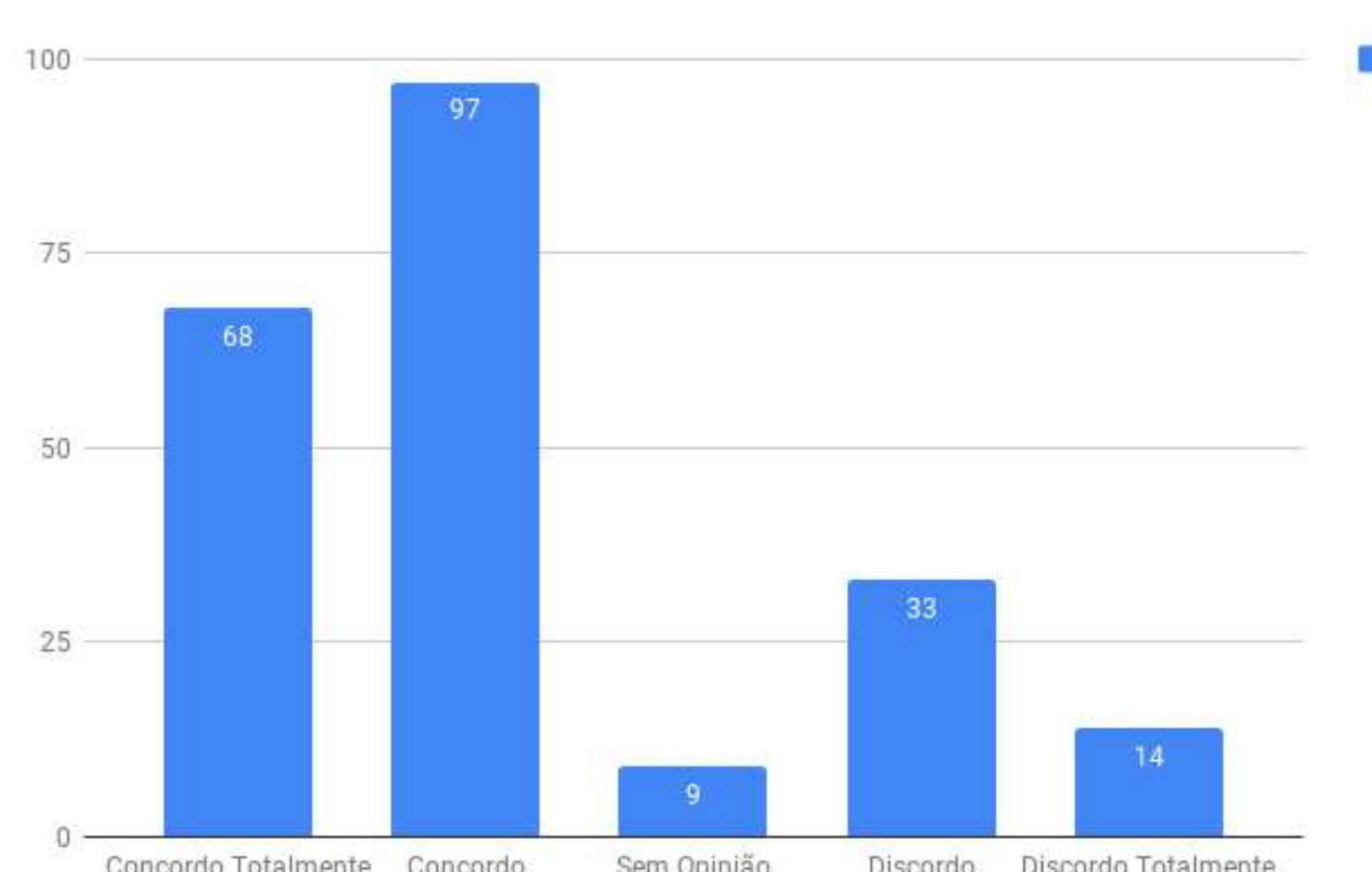


Fig. 1 – Nível de concordância relativo à preocupação do tempo necessário a despendar para a aprendizagem do QDAS

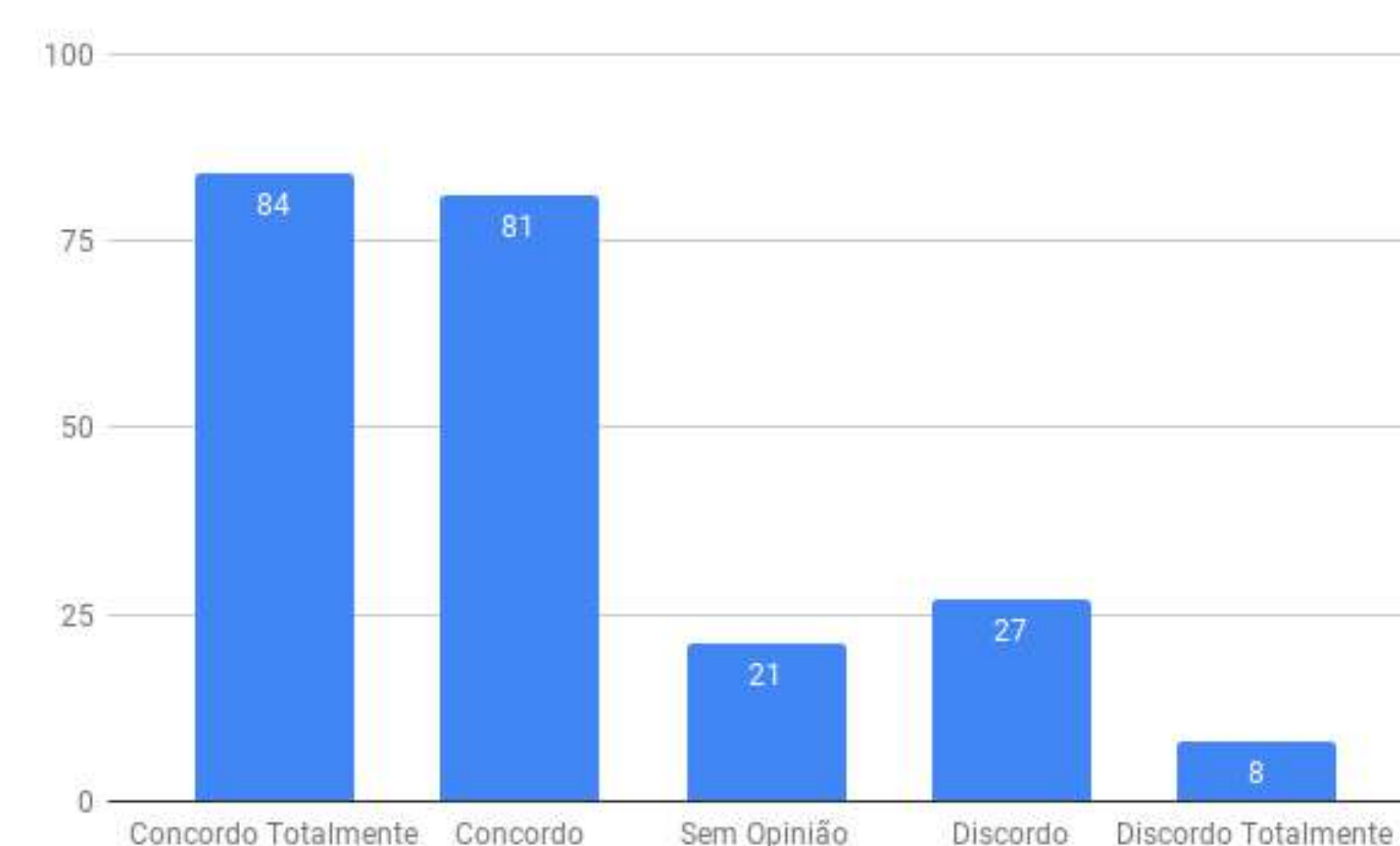


Fig. 2 – Nível de concordância relativo à preocupação com os custos de formação de QDAS

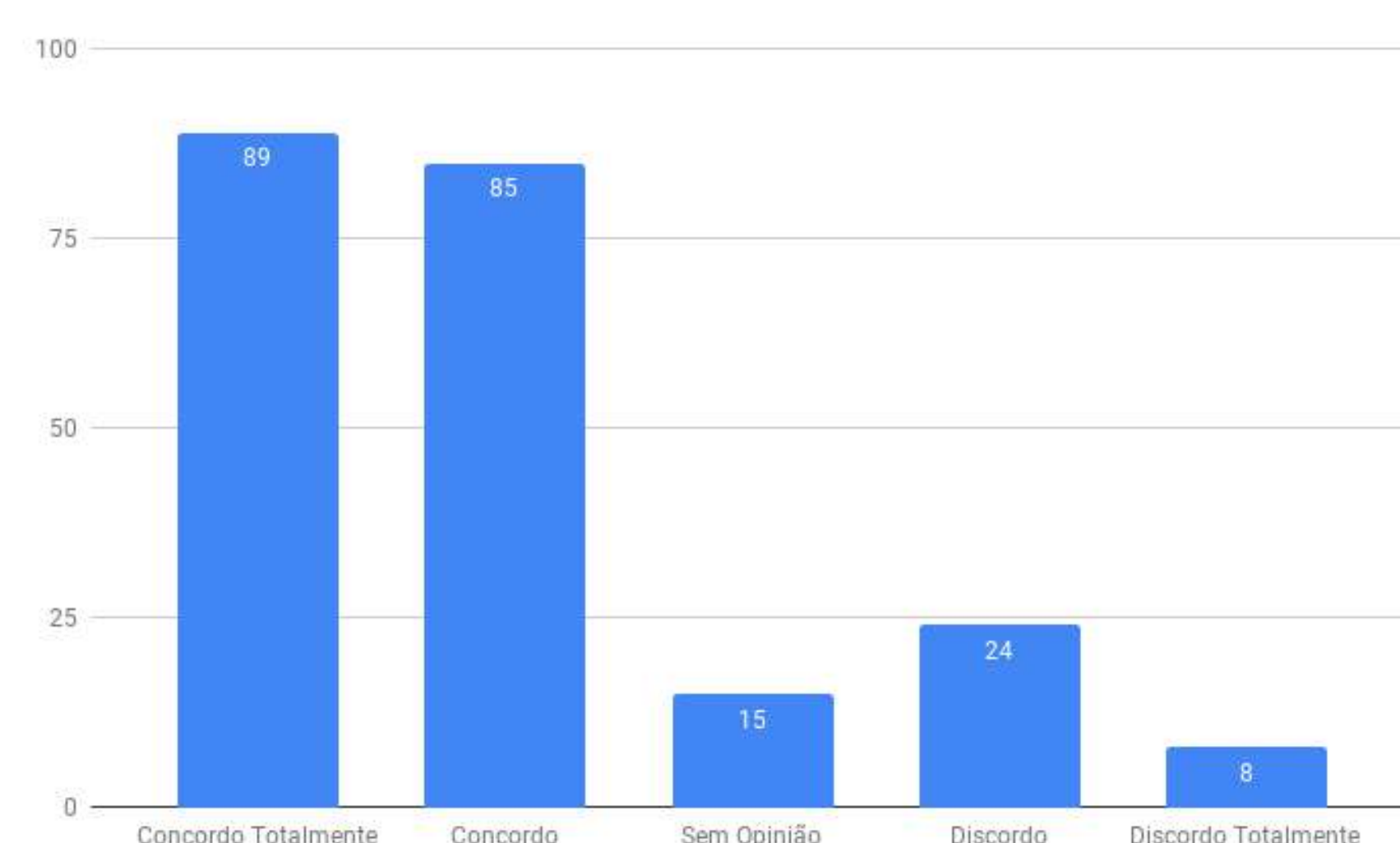


Fig. 3 – Nível de concordância relativo à preocupação na correta compreensão das instruções dos QDAS

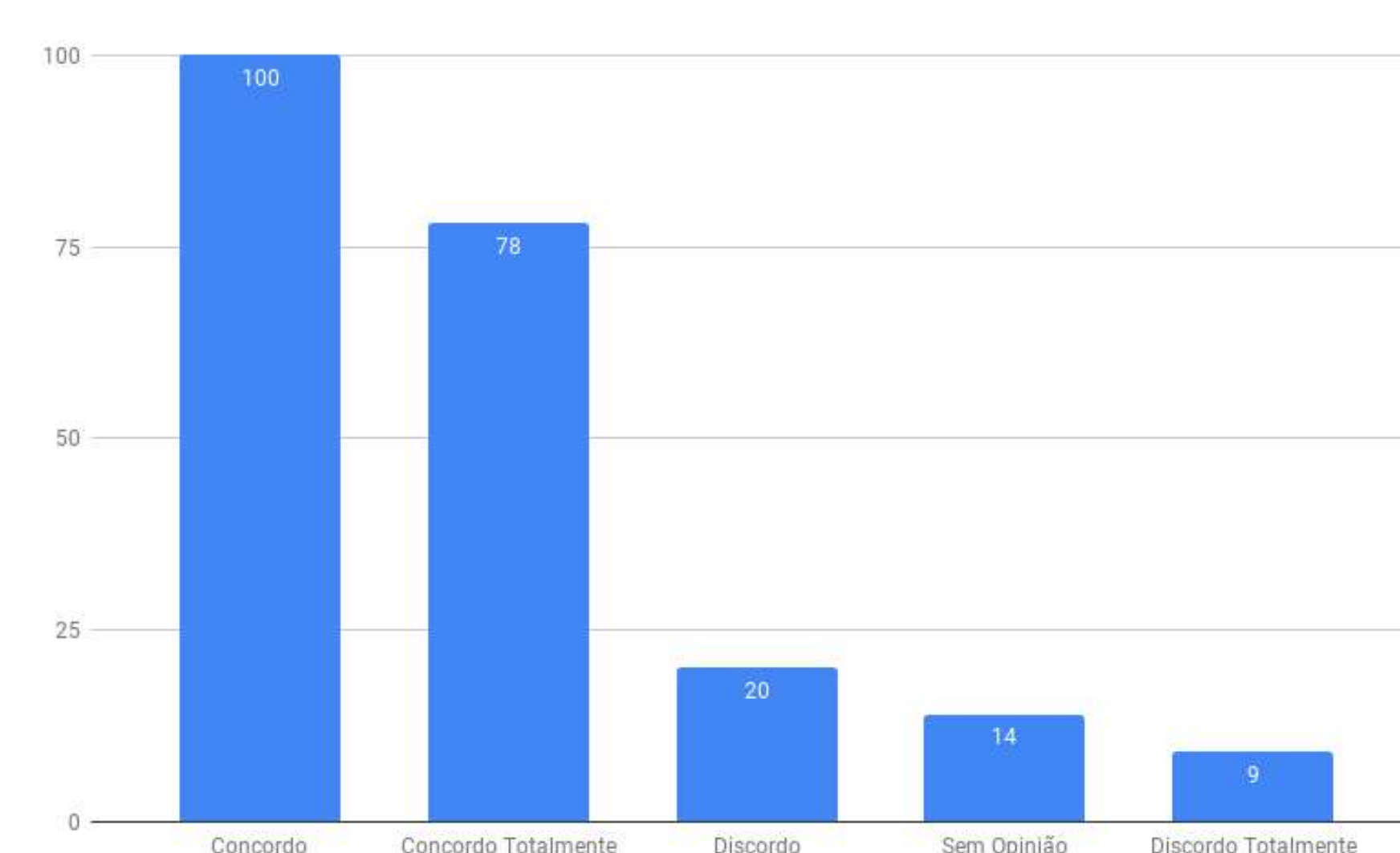


Fig. 4 – Nível de concordância relativo à preocupação em encontrar facilmente as ferramentas de apoio à aprendizagem dos QDAS

#### Considerações Finais

Apesar de não existir uma grande discrepância entre os vários tipos de preocupações dos utilizadores de QDAS, é possível constatar que a sua maior preocupação incide sobre a facilidade de procura das ferramentas de apoio à aprendizagem de QDAS.

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## Árvores Monumentais de Portugal: da compreensão pública a uma literacia científica

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\*GI2, CIDTFF, Universidade de Aveiro

\*\*Centro de Ecologia Funcional, Universidade de Coimbra

### Resumo

Sendo a falta de informação e a subvalorização do potencial que as árvores monumentais e/ou classificadas de Arvoredo de Interesse Público (i.e. particular porte, desenho, idade, raridade ou elevado valor natural, histórico, cultural ou paisagístico) apresentam dois aspetos a colmatar, o desenvolvimento de ações de comunicação em ciência contribuirá para aumentar a literacia científica dos cidadãos. Neste sentido, o projeto de investigação pretende contrariar o fenómeno *plant blindness*, pelo envolvimento do público-alvo em projetos de ciência para despertar o seu interesse, conhecimento, e atitude sobre a botânica, em geral, e sobre as árvores monumentais, em particular. Os resultados preliminares obtidos evidenciam que os projetos desenvolvidos têm sido eficazes na sensibilização e envolvimento do público na temática. O projeto de investigação alcançou vários setores da comunidade (e.g., político, académico, sociedade), ao merecer destaque, em diversos órgãos de comunicação social (imprensa, televisão e rádio). A convite de instituições nacionais foram dinamizadas várias sessões que incluíram palestras, seminários, workshops e roteiros botânicos.

### Introdução

Da revisão da literatura emergiram várias linhas orientadoras do trabalho de investigação [1-7]:

Árvore Monumentais:

Valor	Ameaças
Legislação nacional	Difusão da cultura científica
Exploração/Brincar ao ar livre	<i>Plant blindness</i>

### Objetivos Gerais

- Contrariar o fenómeno de *plant blindness*;
- Promover a literacia científica;
- Desenvolver e avaliar o impacto de metodologias para o envolvimento de públicos-alvo, em projetos de ciência, em contexto de educação não formal.

### Projetos desenvolvidos e/ou em curso

Dados qualitativos e quantitativos (e.g., revisão sistemática e crítica de pesquisa, observações, entrevistas, desenho, questionário) foram recolhidos para identificar as conceções do público-alvo sobre as árvores monumentais, antes e após o desenvolvimento das atividades.

### Informação institucional:

- Análise de legislação (nacional e europeia);
- Análise do Registo Nacional do Arvoredo de Interesse Público do Instituto de Conservação da Natureza e das Florestas (processos classificados de 1939-2012);
- Questionários aos municípios da área regional de Turismo do Centro de Portugal Continental (n=100);

### Perceção do público:

- *Ciência Viva* (n=59);
- *Da bolota à árvore* (n=273 crianças do 1º CEB);
- *Ciência cidadã & seniores* (n=61);

### Envolvimento do público com ciência:

- Sessões públicas (n > 1000) / divulgação nos *Media* (e.g., DiCYT, RTP, Antena 1, JN, Observador, *Wilder*).



Fig. 1 – Exemplo de sessões dinamizadas por convite e algumas das notícias divulgadas nos *media* sobre o projeto de investigação.

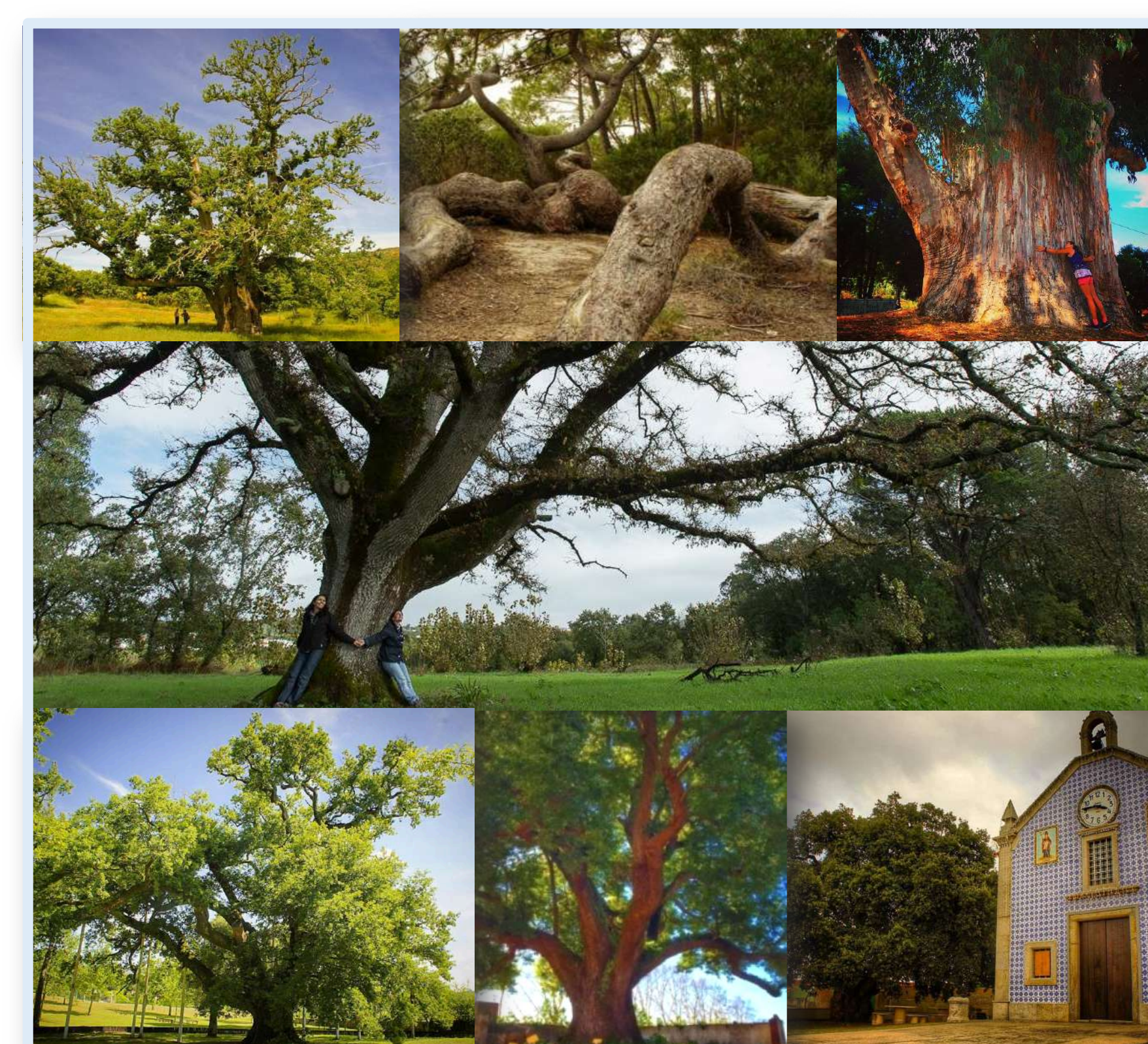


Fig. 2 – Árvores monumentais e/ou classificadas de Arvoredo de Interesse Público.



Fig. 3 – Exploração botânica realizada durante as atividades científicas de carácter *indoor* e *outdoor*.

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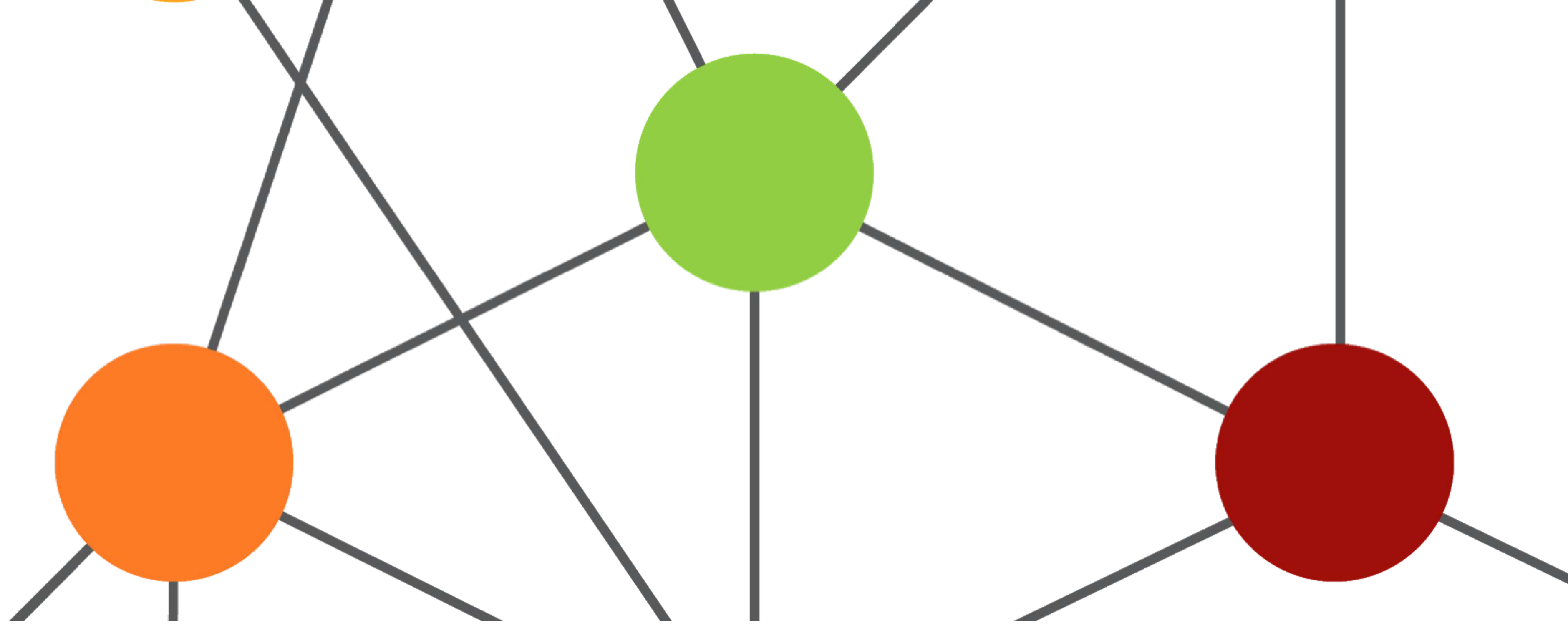




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## Educating teachers for global citizenship: Exploring the potential of “third space”

**Mónica Lourenço & Ana Isabel Andrade**  
University of Aveiro, CIDTFF (Portugal)

### Abstract

This project aims to understand the transformative potential of “third space” in the professional development of teachers and teacher educators, namely in building their confidence to integrate global citizenship into their professional knowledge and identity. To address this aim, a case study will be conducted with volunteer pre-service teachers, who are attending Master’s Programs in Teaching at the University of Aveiro and their supervisors. A hybrid (physical and virtual) space will be created to allow these teachers to connect, learn and work together either face-to-face in community environments (e.g., libraries, museums, parks) or online through open source learning platforms. Data will be collected from pre-service teachers’ portfolios and reflective journals, constructed throughout an academic year, and focus group sessions with all the participants. Data will be submitted to content analysis and will focus on teachers’ discourses as indicators of their professional development. Results of this project are expected to shed more light on the possibilities and constraints of designing teacher education programs that are more “international” and more capable of responding to societal challenges.

### Background

**Global citizenship education** has emerged in recent years as a pedagogical possibility to prepare teachers for a globalized and multicultural world. Still, several studies [1, 2] suggest that global citizenship is a vague and complex notion for teachers and teacher educators, who feel they need specific guidance on appropriate teaching methods and better subject knowledge to be able to integrate it into their skillset and mind-set. Considering these challenges, this project draws on the theoretical construct of “third space” [3,4] to create a hybrid (physical and virtual) space where academic and practitioner knowledge, and knowledge that exists in the community, come together in new and less hierarchical ways in the service of teacher education for global citizenship (Fig. 1).

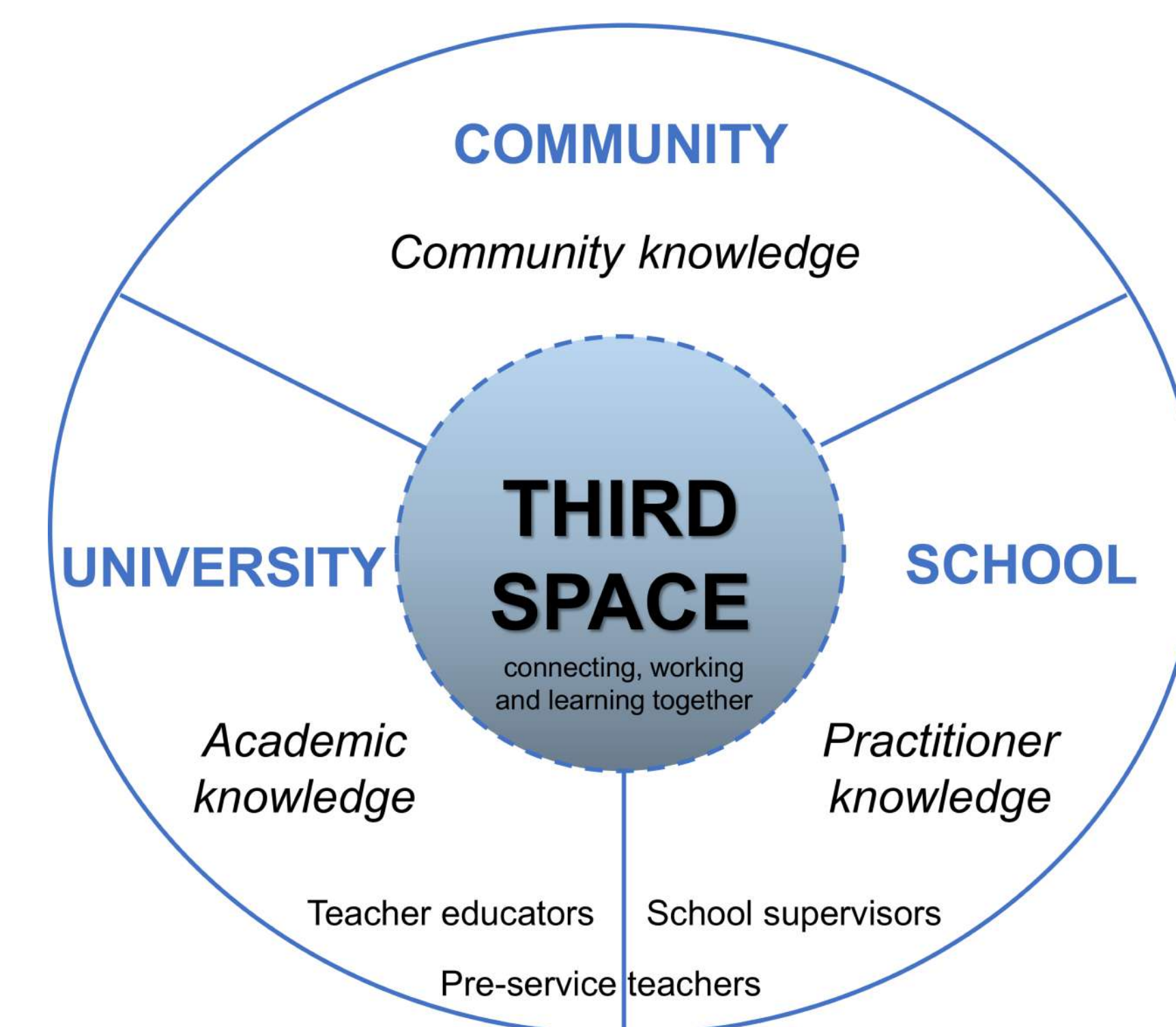


Fig. 1 – A “third space” for teacher education.

### Research question and objectives

**RQ:** *What is the transformative potential of “third space” in the development of teachers’ professional identity as “worldminded” educators?*

01. Understand the beliefs, assumptions and knowledge that pre-service teachers and teacher educators have of global issues and global citizenship education;
02. Design and conduct a teacher education program for global citizenship, sustained on a hybrid space of learning, and built around plural and multimodal discursive practices;
03. Evaluate the impact of the program on the professional development of teachers and teacher educators.

03. Evaluate the impact of the program on the professional development of teachers and teacher educators.

### Methodology

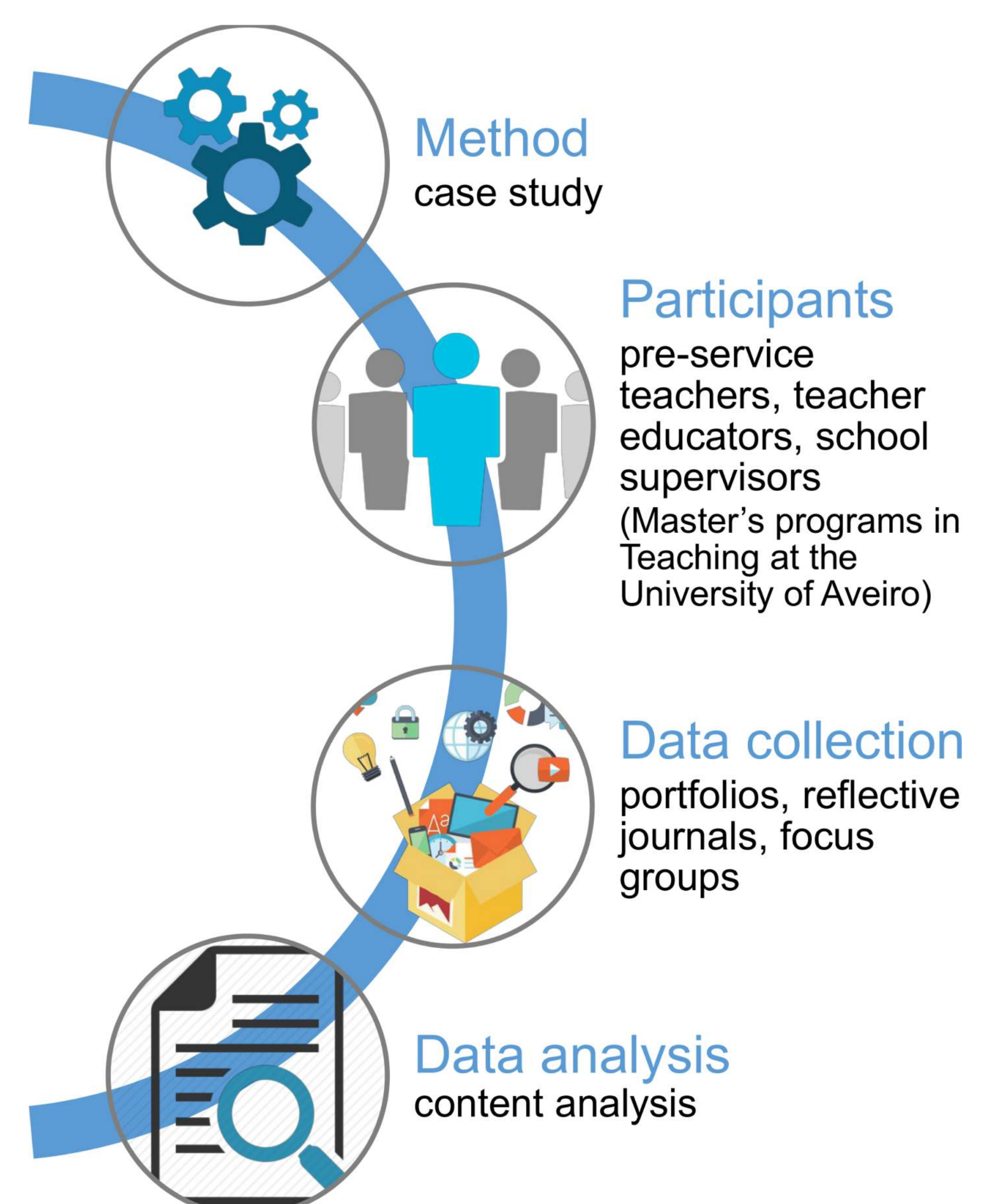


Fig. 2 – Research methodology.

### Expected outcomes

- Teacher education modules on topics related with global citizenship education.
- Recommendations for teacher educators on how to integrate global citizenship in teacher education programs, using “third spaces” and community knowledge to address “glocal” issues.

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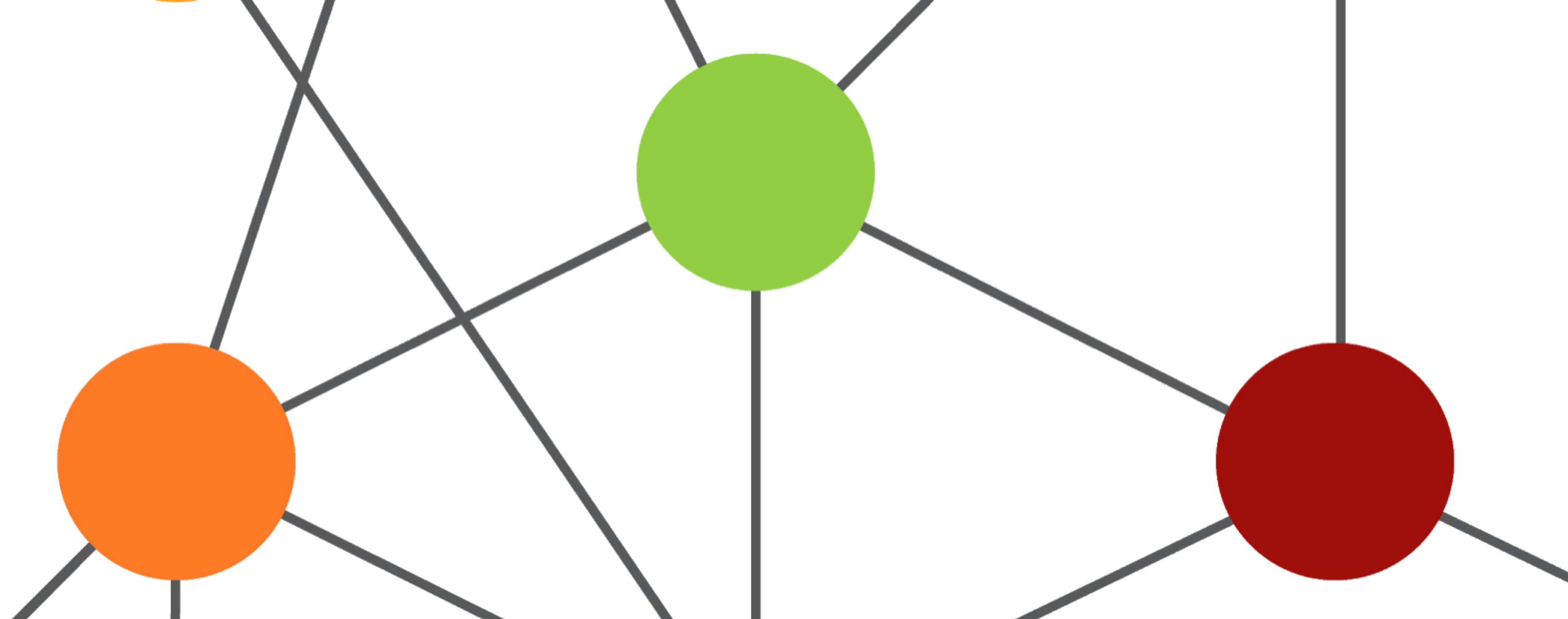




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## Investigação e supervisão intercultural nos Programas Doutorais da UA

Susana Pinto & Maria Helena Araújo e Sá  
CIDTFF, Universidade de Aveiro (Portugal)

### Resumo

A problemática da *investigação e supervisão intercultural* começa a adquirir um relevo importante nas IES portuguesas, designadamente no âmbito da sua estratégia de internacionalização. Esta problemática adquire destaque no contexto dos Programas Doutorais que, crescentemente, recebem estudantes internacionais, essencialmente da CPLP.

Esta questão tem vindo a ser abordada no CIDTFF, em particular no quadro dos projetos *Euromec* e *Competência intercultural como dimensão central na internacionalização do ensino superior em Portugal*. Os resultados mostram que docentes e estudantes vivenciam esta situação com alguma tensão, nomeadamente no que diz respeito ao reconhecimento e gestão de diferentes repertórios linguístico-culturais e académicos.

Neste quadro, este estudo propõe-se compreender de que forma a supervisão de estudantes de doutoramento da CPLP na UA se pode consubstanciar enquanto zona de contacto intercultural que contribua para o desenvolvimento pessoal e profissional de supervisores e estudantes e para a co-construção de conhecimento científico.

### Quadro Concetual

#### *Intercultural Supervision*

"...a zone of mutual learning in which student and supervisors keep exchanging the role of supervising and scaffolding and the supervisory relationship becomes more dynamic and reciprocal." [1]

"...the complex art of encouraging students to incorporate their own cultural knowledges, that adapts to their cultural interaction styles, that acknowledges the places they come from." [2]

### Objetivos de Investigação

- Compreender de que forma a supervisão de estudantes de doutoramento da CPLP na UA pode consubstanciar-se enquanto zona de contacto intercultural.
- Compreender como é que a diversidade linguístico-cultural é valorizada enquanto possibilidade de desenvolvimento pessoal e profissional.
- Analisar como é o conhecimento científico co-construído nessa zona de contacto intercultural.
- Propor recomendações para uma supervisão intercultural que possibilite o desenvolvimento pessoal e profissional de estudantes e supervisores e o desenvolvimento de processos investigativos em ambientes interculturais.

### Metodologia

- Estudo de caso (1ª fase em curso: estudo exploratório no DEP; 2ª fase: alargamento do estudo a toda a UA).
- Recolha de dados: entrevistas semiestruturadas a estudantes e supervisores; relatos de encontros de supervisão.

### Contexto da Investigação

UA - 52 PD: 1757 estudantes (1221 Portugueses; 536 estrangeiros, dos quais **307 da CPLP**).

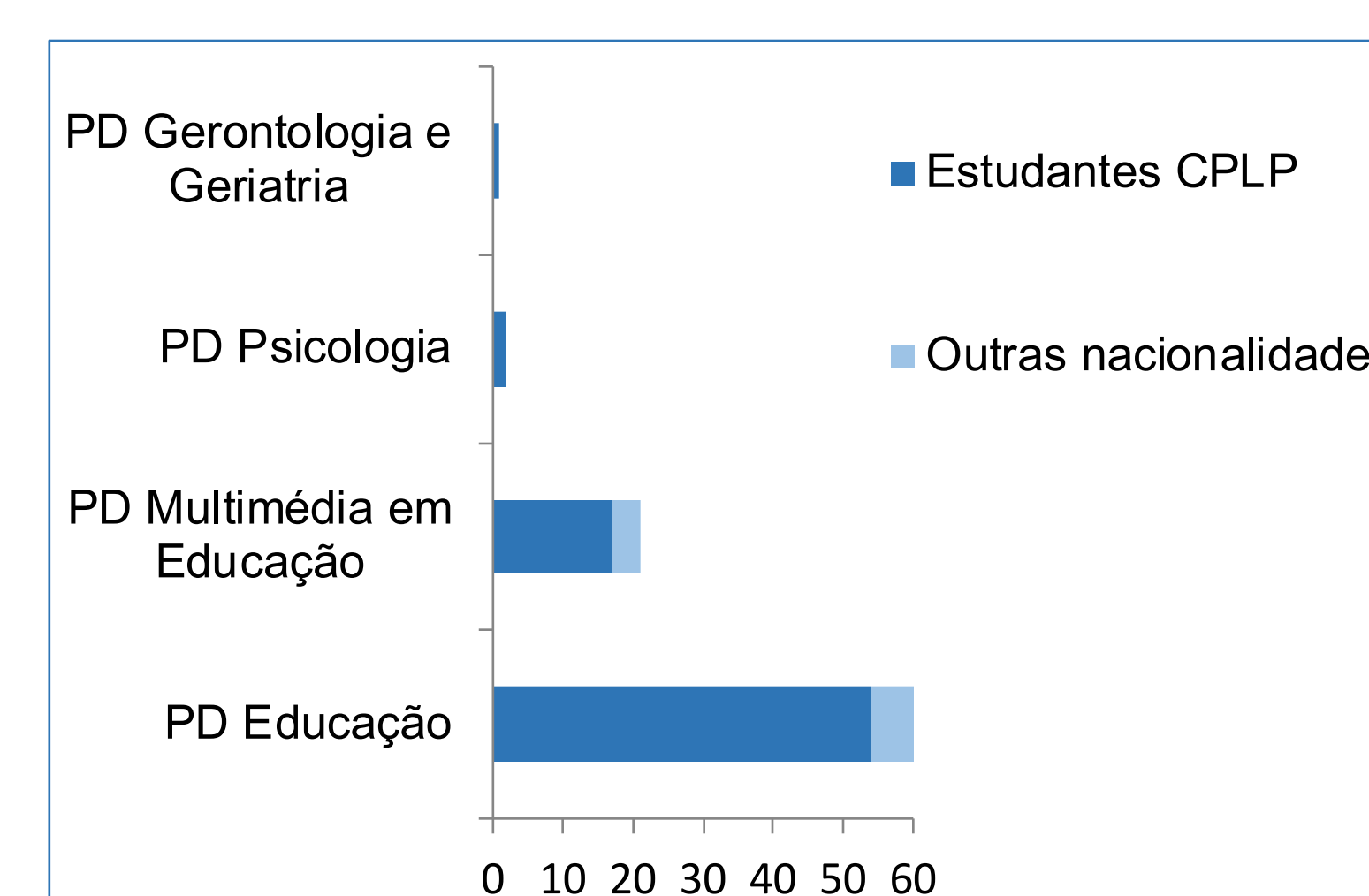
Nacionalidade	N.º de estudantes
Brasil	202
Angola	43
Cabo Verde	27
Moçambique	24
Timor-Leste	8
São Tomé e Príncipe	2
Guiné-Bissau	1

Fig. 1 – Nacionalidade dos estudantes da CPLP/UA  
Fonte: Gabinete de Planeamento Estratégico, UA

DEP - 4 PD (Educação, Multimédia em Educação, Psicologia, Gerontologia e Geriatria): 220 estudantes (134 Portugueses; 86 estrangeiros, dos quais **74 da CPLP**).

Nacionalidade	N.º de estudantes
Brasil	39
Angola	24
Moçambique	8
Cabo Verde	1
São Tomé e Príncipe	1
Timor-Leste	1

Fig. 2 – Nacionalidade dos estudantes CPLP/DEP  
Fonte: Gabinete de Planeamento Estratégico, UA



Graf. 1 – Estudantes estrangeiros nos PD do DEP  
Fonte: Secretaria do DEP, UA

### Resultados esperados

- MOOC dirigido a supervisores do 3.º Ciclo.
- Recomendações para uma supervisão intercultural no 3.º Ciclo.

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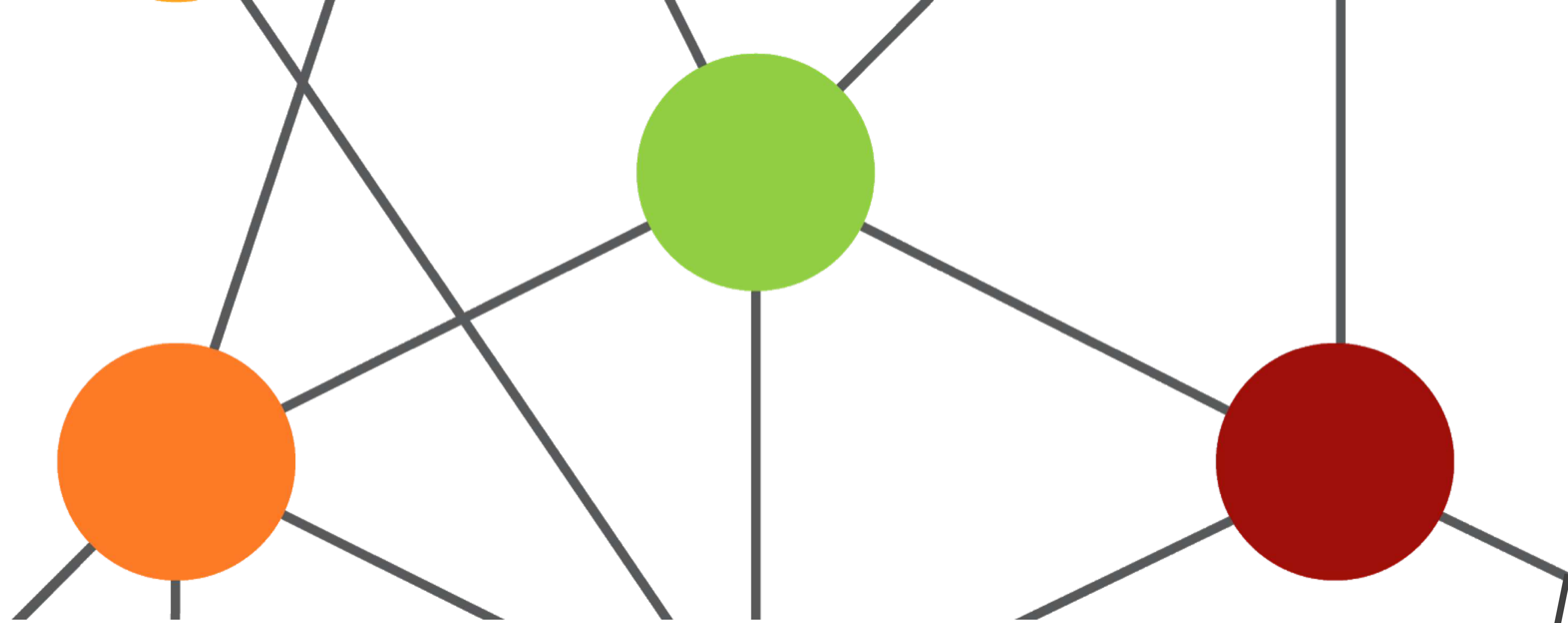




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## Inclusão no Ensino Superior: processos que visam intervir para potenciar a inclusão de estudantes com NEE

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### Resumo

Numa perspetiva de educação para todos e de equidade de oportunidades, o presente estudo, um recorte da investigação de doutoramento em curso, objetiva perceber os aspectos referidos como essenciais para a transição e adaptação de estudantes com Necessidades Educativas Especiais (NEE) e seus familiares e visa potenciar a inclusão destes estudantes no ensino superior, a partir do desenvolvimento e implementação de um Programa de Intervenção Psicossocioeducativo (PIP).

Tal como corroboram diversos investigadores, existe uma correlação entre o suporte familiar eficaz e o que ele providencia para o ajustamento académico e a inclusão do estudante com NEE ao nível do ensino secundário. Neste sentido, espera-se que o PIP possa ser uma ferramenta que potencie esta transição também para o ensino superior.

**Palavras chave:** Inclusão no Ensino Superior; Necessidades Educativas Especiais; Intervenção Psicossocioeducativa

### Introdução

A literatura científica tem vindo a reiterar que a participação dos pais em ações no meio escolar apresenta resultados académicos e sociais positivos para estudantes do ensino secundário [1]. Na perspetiva de estudantes universitários com NEE, o apoio familiar é essencial para o ingresso e a permanência no ensino superior [2]. Este suporte promove a resolução das necessidades de equilíbrio físico e emocional [3], bem como educacional, pois são os familiares que possuem maior conhecimento sobre as fragilidades e potencialidades destes estudantes [4]. A inclusão centra-se em responder a estas NEE, já que estes estudantes apresentam maior risco de adaptação e dificuldades académicas [5].

### Metodologia

A presente investigação conta com dois estudos em curso. Num primeiro momento, são verificadas as percepções de estudantes com NEE e seus familiares sobre a trajetória de inclusão, de entre os obstáculos e os aspectos satisfatórios destas vivências. Num segundo momento, todas estas experiências, juntamente com o aporte teórico, serão convertidos em 5 sessões de intervenção nos âmbitos psico, socio e educativos.

### Considerações Finais

Tal como referenciado, espera-se que o PIP possa ser uma ferramenta satisfatória para potenciar a transição e a inclusão de estudantes com NEE, de forma a clarificar os benefícios do suporte familiar neste nível de ensino e verificar o impacto deste suporte, quer nos aspetos sociais, psicológicos e educativos, além de poder ser aplicado em outras realidades, ampliando os contributos nesta área de investigação.

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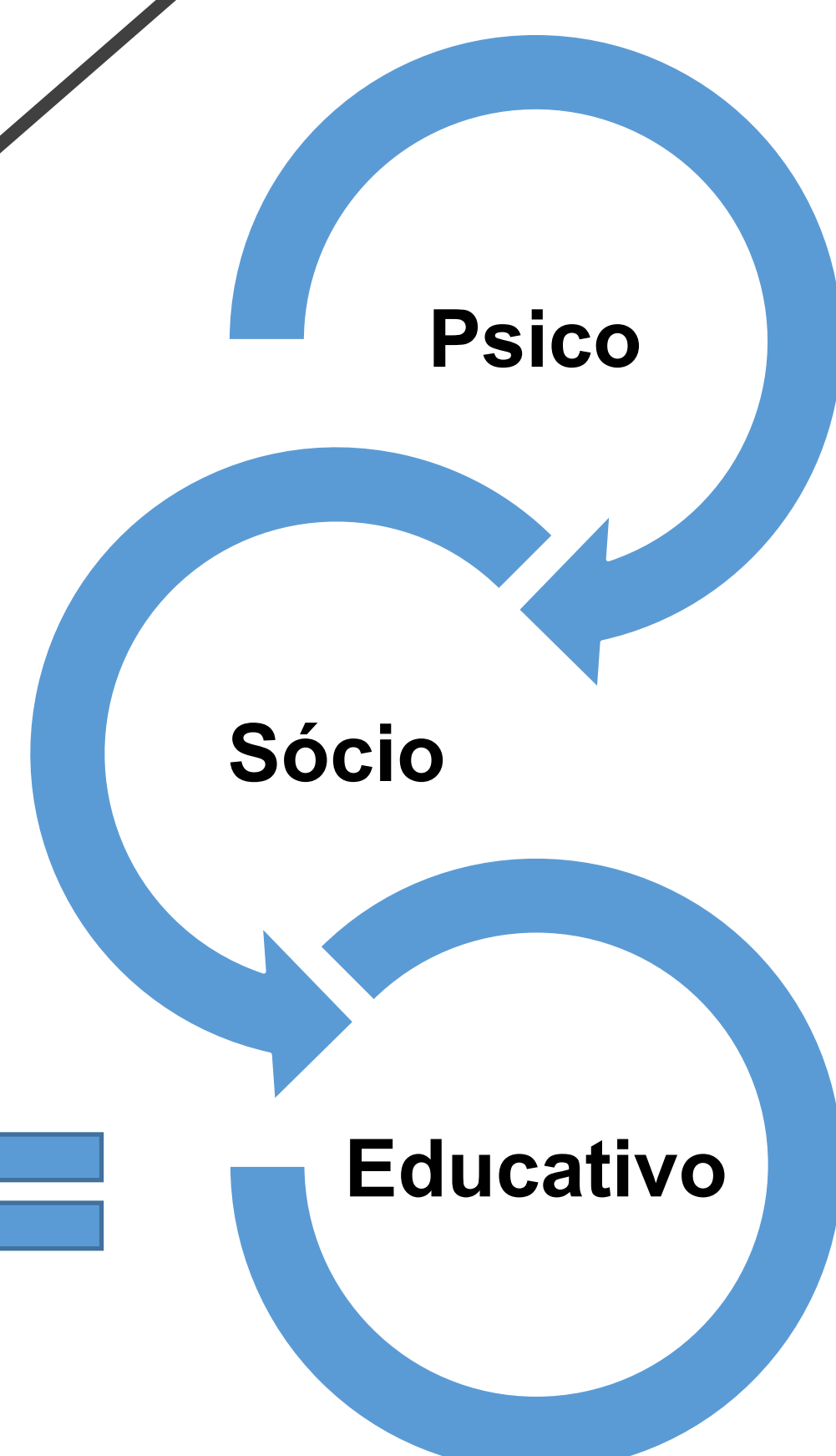
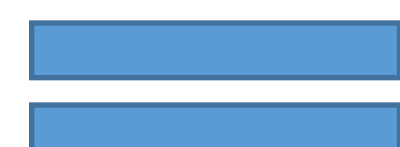
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### O PIP

O Programa de Intervenção Psicossocioeducativo (PIP) é uma iniciativa inovadora ao nível nacional, que contará com a participação presencial de familiares de estudantes com NEE do último semestre do 12º ano, de Aveiro e de familiares de estudantes caloiros da Universidade de Aveiro, de forma a aferirmos o impacto e associação desta intervenção no ajustamento dos estudantes.

**INCLUSÃO**



Este trabalho é financiado por Fundos Nacionais através da FCT – Fundação para a Ciência e a Tecnologia, I.P., no âmbito do projeto UID/CED/00194/2013.

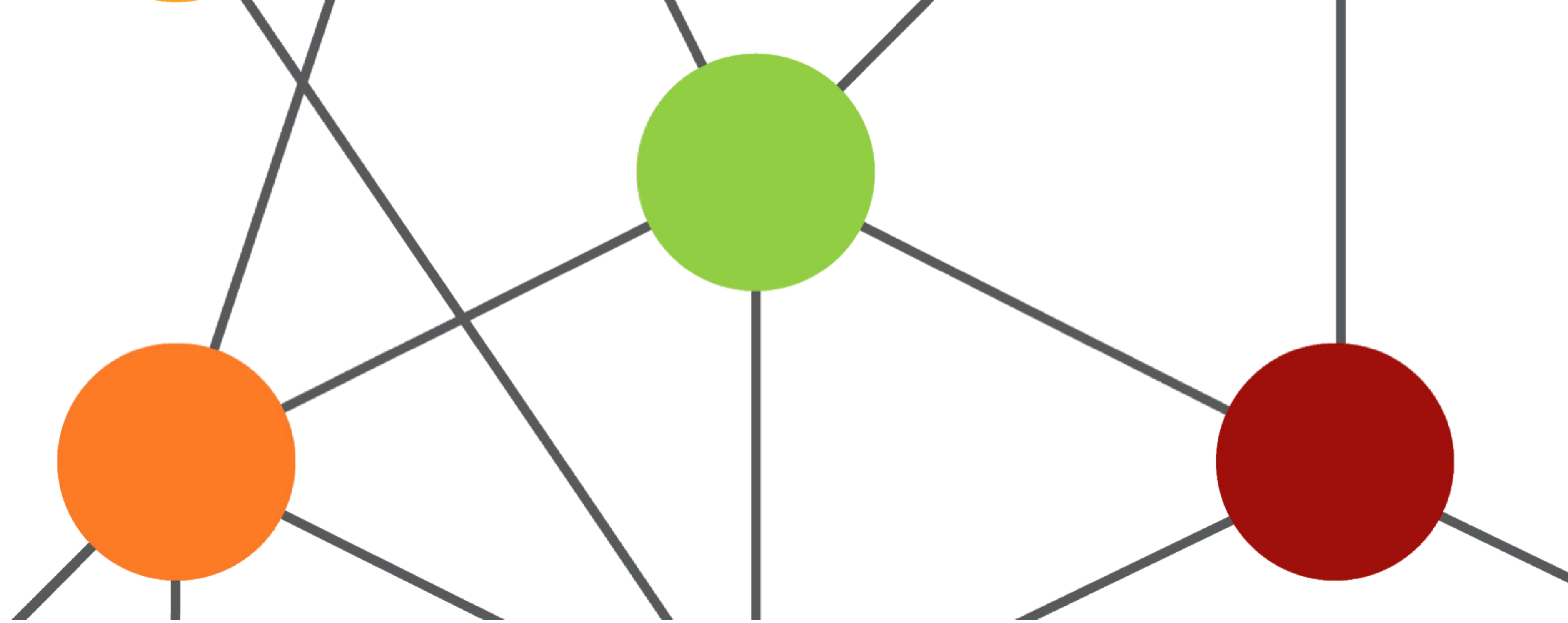




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## Cenários Ubíquos e a Ciência participativa : para ensinar e aprender

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### Resumo.

O presente projeto tem como ponto de partida: Quais as contribuições dos processos ubíquos no contexto da ciência participativa? Em busca de respostas temos como objetivo geral: analisar os cenários ubíquos na ciência participativa na formação de professores. Tem como método a investigação-ação por meio da implementação de uma formação ubíqua para fortalecer a ciência participativa, por meio de webconferências. O público envolve alunos/ professores de uma pós-graduação da Universidade Estadual do Ceará (UECE-Brasil) e pesquisadores de universidade internacionais, além da comunidade não-acadêmica. Tem como instrumento de pesquisa: a observação participante, inquérito por questionários, utilização de ferramentas de mapeamento para identificar as percepções dos sujeitos sobre a temática. Como resultados espera-se a produção organizada de saberes em cenários ubíquos, além da promoção do engajamento participativo com a comunidade acadêmica e não-acadêmica, fortalecendo o tripé ensino-pesquisa-extensão.

### Problematização

Diante da ampliação de espaços formativos e de uma sociedade marcada por novas práticas didáticas e na busca por novas formas de aprender na/com a rede. Esse projeto ancora-se ao articular a teoria e a prática docente por meio de uma investigação-ação. Com isso, buscamos nortear nossos estudos na seguinte questão : Quais as contribuições dos processos ubíquos no contexto da ciência participativa ?

#### Objetivo Geral :

Analisar os cenários ubíquos na ciência participativa na formação de professores.

#### Objetivo Específicos :

Identificar os conhecimentos que os professores possuem sobre cenários ubíquos.

Implementar uma formação ubíqua para fortalecer a ciência participativa.

Mapear espaços formativos com a integração das tecnologias digitais que potencializam a ciência participativa.

### Revisão de Literatura

A Ciência é um instrumento social de extremo valor histórico, tendo em vista suas dimensões críticas e questionando o limite da sua neutralidade. Com isso, esse projeto tem o foco de buscar as novas formas de produção de conhecimento, com o engajamento dos cidadãos, por meio da ciência participativa, como uma forma de fazer ciência ao envolver os agentes *pari passu* com os cientistas, evidenciando um estudo colaborativo. (SOUZA, SILVA, FERRAZ DE ABREU, 2018). Diante desse contexto, o desafio é reconhecer essa colaboração em cenários ubíquos em que os participantes estão em espaços desterritorializantes, rompendo fronteiras de espaço e tempo, demarcados pela instantaneidade impostas pela mobilidade, com uma mente disruptiva, emergindo um novo processo de ensinar e aprender, marcado por esta ubiquidade. ( Santaella, 2013).

### Metodologia

O projeto tem como foco a abordagem da Responsabilidade e Inovação na Pesquisa – RRI, por meio de uma investigação-ação. Com 20 professores ( alunos/ professores da especialização em Tecnologias Digitais (UECE), 7 pesquisadores das Universidades nacionais ( Brasil ) e internacionais - *Open University* – UK e Universidade de Aveiro) e comunidade não acadêmica. Com as seguintes etapas: 1. Diagnóstico inicial ( observação de campo e questionários semi-estruturados); 2. Processo formativo ( 4 webconferências - Jornadas Virtuais (SOUZA *et al*, 2016) ); 3. Coleta e análise dos dados com a categorização ( análise de conteúdo). A investigação assume a forma cíclica, num processo de ação-reflexão-ação, dando voz a questões que nascem da prática.



Fig. 1 – Jornada Virtuais. Fonte: Adaptado (Souza *et al*, 2016)

### Recolha e Análise de dados

Ferramentas de mapeamento das Webconferências e análise de conteúdo ( Bardin, 2016).

### Resultados Esperados

- \_ Produção organizada de saberes em cenários ubíquos.
- Promoção de engajamento participativo com a comunidade acadêmica e não acadêmica, fortalecendo o tripé ensino-pesquisa- extensão.

### Bibliografia

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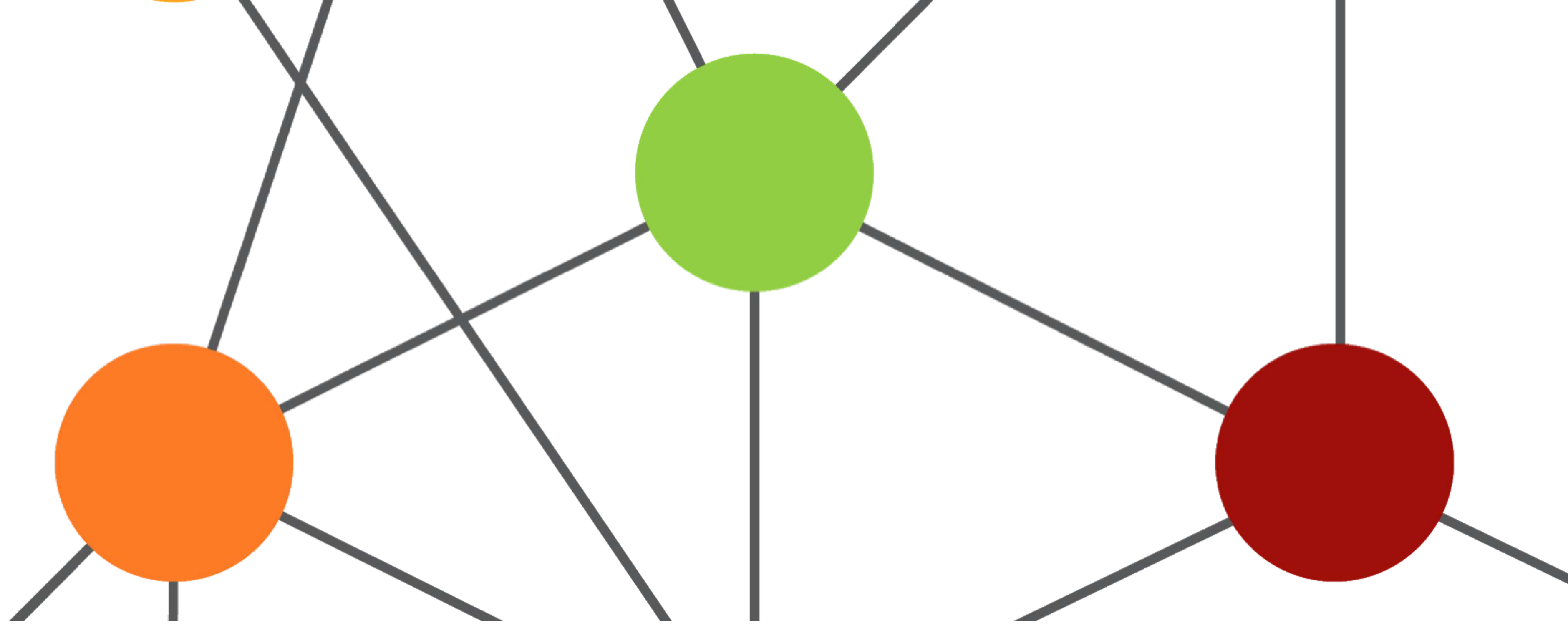




# IAPHE'18

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## Towards Excellence in Engineering Education

Alignment of expectations about the profile of Teachers

**António Andrade-Campos, Bárbara Gabriel, Gillian Owen Moreira,  
João Dias-de-Oliveira, Robertt Valente, Victor Neto**  
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### Abstract

This work presents a project that aimed to give voice to the main stakeholders in Higher Education Institutions (HEI) – and their engineering programs – helping to understand the involved teaching/learning processes and focused on the first year of engineering courses at the University of Aveiro.

The overall mission behind the E3@UA project is to work towards the excellence in engineering education, working on and promoting the optimal teacher profile, particularly at this stage focused on the teachers involved in the first years of engineering education degrees at University of Aveiro.

The adopted approach relied on a set of meetings and discussion forums that provided the required context for identifying the most relevant attributes of what is the “perceived quality” of the teaching/learning process itself, as coming from the point of view of the relevant stakeholders.

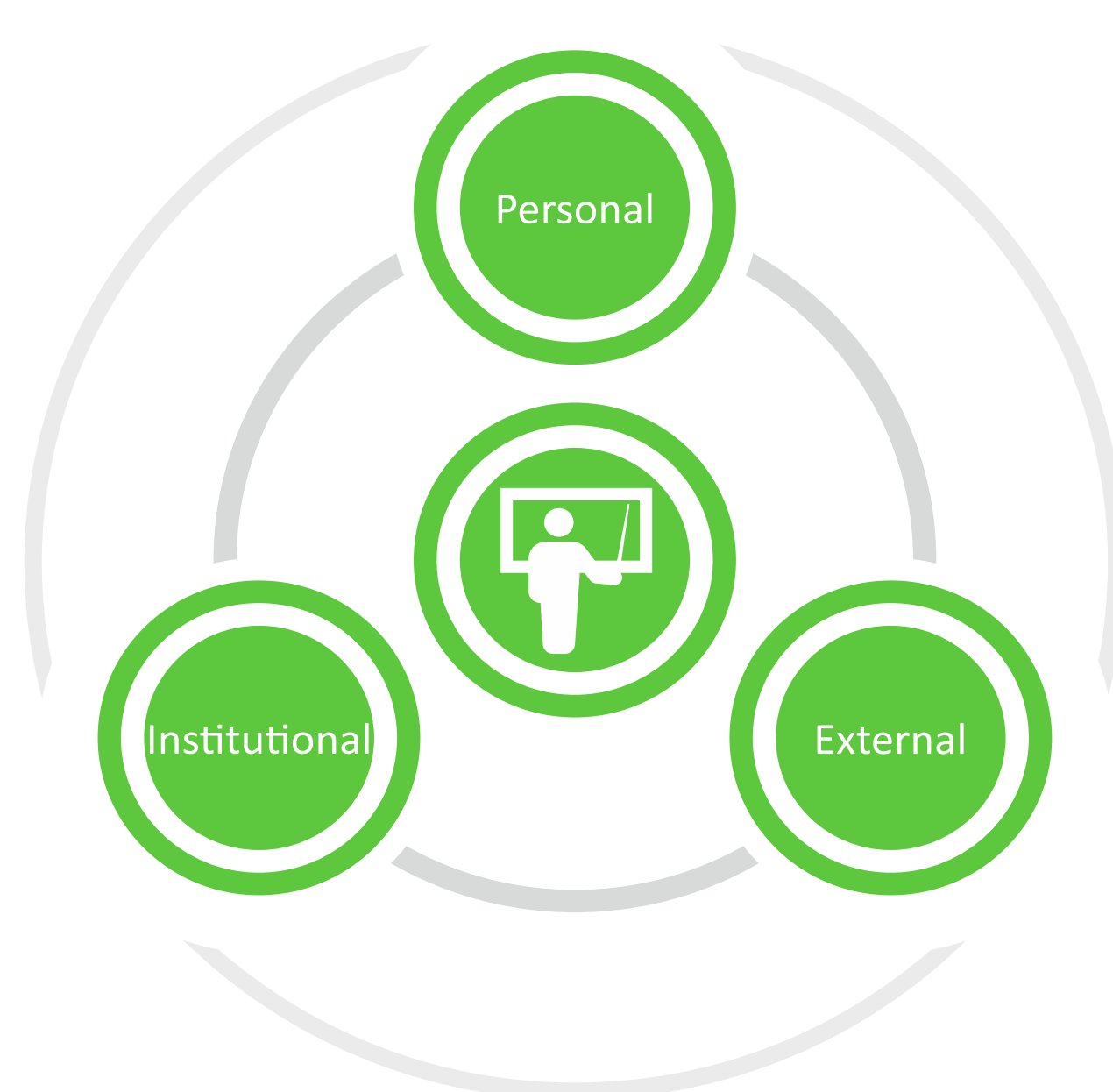
The analysis of those different perceptions helped on the definition of the optimum profile of Higher Education Teachers, especially for those in contact with first year engineering students. However, the project’s methodology can also be applied on thinking and defining new (or improved) engineering courses, as well as on identifying relevant areas to be developed within a Higher Education Institution when aiming to fill the gap between expectations of students, teachers and the society.

### The E3@UA project: Excellence in Engineering Education at UA

The E3@UA project, carried out between January and July 2017, relied on assuming that excellence in teaching and learning of/in/for engineering is one of the quality marks of the University of Aveiro.

Based on a previous work on how to promote an **effective engagement of different stakeholders in the engineering education process** [1], focusing on the **first year of engineering curricula** and assuming **teachers as the key element** of the teaching/learning process, E3@UA provided space for discussion on different relational dimensions of each teacher in HEI: personal; institutional; and external.

Doing so, the project was able to provide information about the different perceptions on what are the most important quality factors for excellence in engineering education, when seen from different point of view (teachers, students, faculty management representatives).

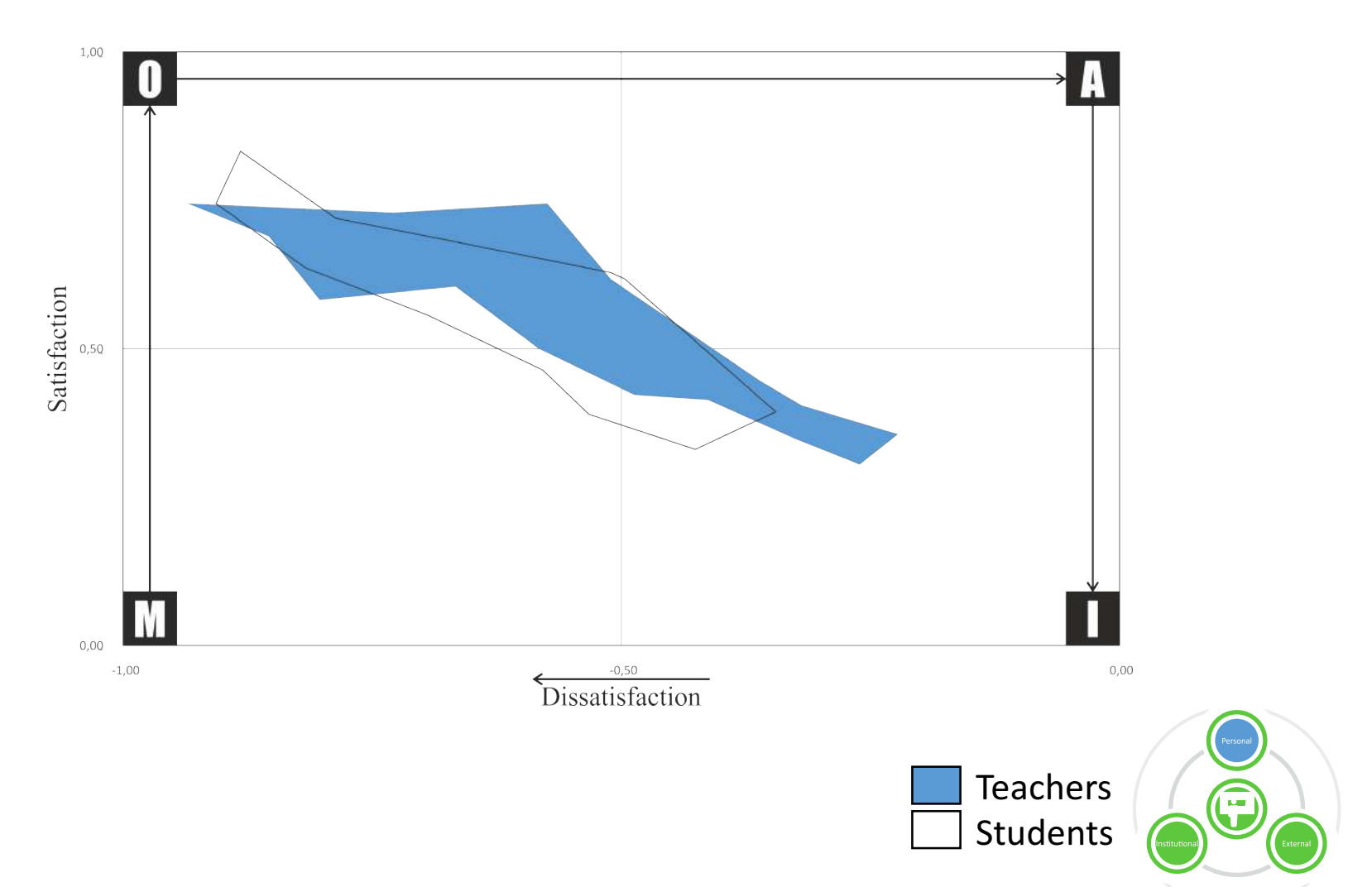


### Using a Kano model for quality perceptions

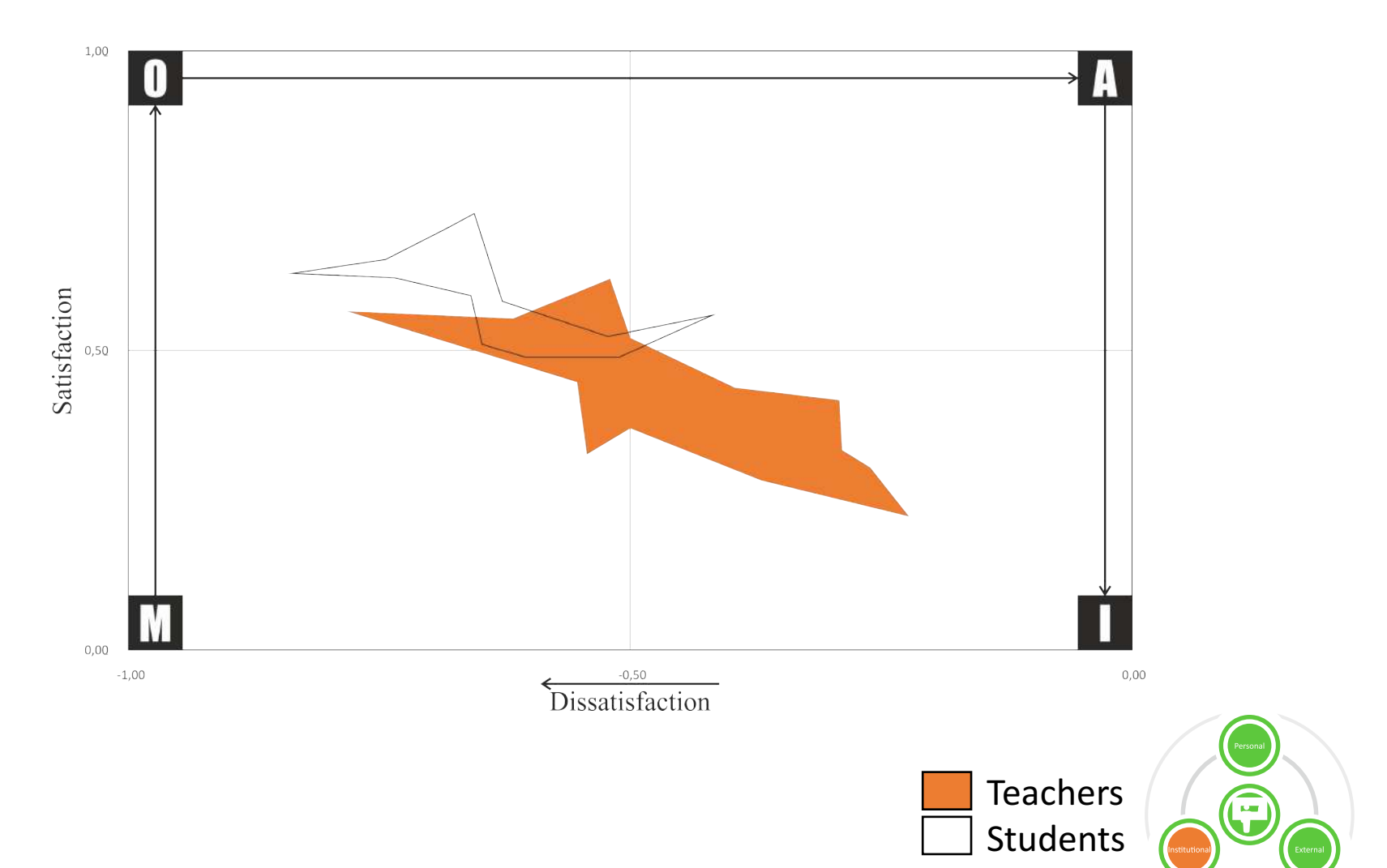
The concept behind the Kano model proposes that a quality feature of a product can be seen as a measure of: (i) the importance a customer expresses; (ii) different categories of customer requirements; and (iii) the overall characteristics of a product within its market. The model typically divides the customer requirements into three main categories: Must-be (M), One-dimensional (O) and Attractive (A). Each category has a different meaning for both satisfaction and dissatisfaction, according to its existence or level of performance.

The results coming from the E3@UA project showed that there are different levels of alignment between the main groups from the academy (teachers and students), and particularly those dimensions where the misalignment (or gap) of perceptions is higher. In a summary, while students tend to see most of the characteristics as performance factors, leading to satisfaction (or dissatisfaction, if underperforming), teachers tend to show that this is only viewed as true for the personal dimension, with the highest misalignment being seen for the external dimension (and its importance or not) for the excellence in the teaching/learning process. This subject can be further explored in the near future with the inclusion of perceptions from the Society about the engineering education programs themselves.

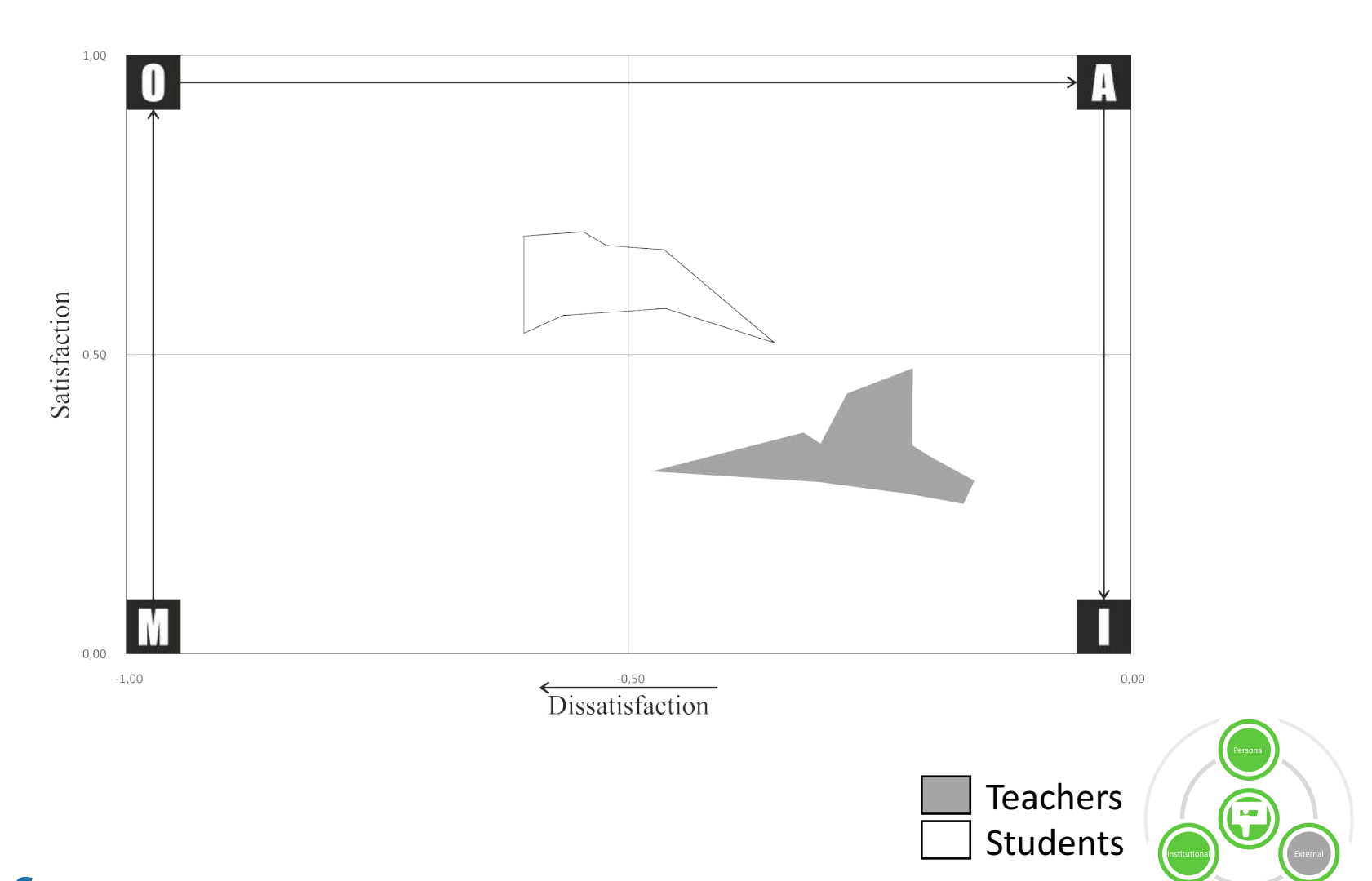
Personal dimension



Institutional dimension



External dimension



### Reference

[1] Bárbara Gabriel, Robertt Valente, João Oliveira, Victor Neto, António Gil Andrade-Campos (2018): A model for the effective engagement of all stakeholders in engineering education and its pilot implementation, *European Journal of Engineering Education*

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