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Chapter

A Transpraxis Approach to Higher Education: A Case Study on Methodological Orientations

Daniel Gutiérrez-Ujaque

Abstract

The critical pedagogy approach opens the door to exploring the Transpraxis Approach (TA) in Higher Education (HE) as a crucial element in promoting social justice through solving social and real problems in the immediate environment. In this study, methodological principles for TA implementation are described. During the academic year 2020–2021, a case study following a participatory action research method was conducted at the University of Lleida to demonstrate how TA can be implemented in the educational methodology of two subjects in two different academic disciplines. A total of 160 students participated: seventy-eight with a bachelor's degree in Social Education and eighty-two with a bachelor's degree in Industrial Engineering. The twenty-seven projects carried out cooperatively by the students were analyzed using content analysis through a system of categories. According to the research, cooperative and experiential learning between university degrees is essential to creating curricular experiences beyond disciplinary boundaries and fragmented knowledge. The paper concludes with ten methodological principles for implementing TA in HE, which present university education as an enabling, collaborative, and critical response to real problems.

Keywords: higher education, critical pedagogy, Transpraxis approach, social work, industrial engineering, innovation

1. Introduction

The COVID-19 pandemic disruptions have shown us that Higher Education institutions need to improve student learning and maintain a modern education for all [1]. Student learning is improved by reforming curricular content that considers students' lifestyles and social and cultural realities by making education more accessible and critical [2]. In addition, institutions should modernize curricula to enhance individual development and collective intelligence, as it will improve students' social and emotional skills [3, 4]. Furthermore, this improvement of institutions must also include modifying their architectural, organizational, and administrative structures to make them more flexible, mutable, and adaptable to the context of a post-industrial society [5]. The reason for this argument lies in transforming the university into an inclusive space consistent with new educational practices. Therefore, improving learning and

constructing modern institutions must respond to a context of uncertainty, change, liquidity, and complexity in the 21st-century culture [6, 7].

A significant current discussion topic concerns how to enhance the quality of HE by eliminating its rigid structure. University education is characterized by reproducing the established order and promoting uncritical individuals under standardized patterns [8]. Reproduction in Higher Education is the result of preserving the foundations of the industrial, functionalist, and control schools of the late 19th and early 20th centuries [9, 10]. As a result, students might be reduced to a body of uninformed individuals and subjected to standardized patterns serving neoliberal ideologies and the market [11]. Therefore, innovative alternative ways to encourage the development of critical thinking and creativity among students while adapting to the circumstances of complexity and uncertainty that characterize our time may be necessary to implement [12].

Understanding the various alternatives to HE indicates that it needs to be rethought based on more inclusive and critical methodological or paradigmatic shifts. As an alternative to rethinking Higher Education, transdisciplinary projects across programs (e.g., between education and engineering) may be an option [13]. Authors such as [14, 15] highlight the need to break down the disciplines between the various grades to promote divergent thinking using curricular content. Also, these authors identify the structure of different initiatives or projects committed to combining different stages of learning as a methodological strategy to improve their training [16]. Corroborating this statement, other researchers such as [17] or [18] reaffirm the gap in implementing projects across programs. Therefore, there is a clear need to generate studies that allow this methodological dimension to be explored in various training contexts.

Rethinking Higher Education also involves the implementation of critical pedagogy. It was the pedagogue Paolo Freire who developed this critical pedagogy approach in the 1970s. He developed a theoretical and practical framework for new liberating practices within educational settings through his struggle against oppression [19]. The main objective of critical pedagogy is to teach students to recognize existing relations of power and privilege instinctively. Furthermore, critical pedagogy aims to analyze the ideologies cultivated within academic institutions that ratify the existence and nature of social and capitalist relations [20]. Lastly, critical pedagogy allows university education to explore ways to create links between people based on equality and justice [21].

This paper explores how transdisciplinary and critical pedagogy can generate new practices in Higher Education that improve students' knowledge and training. So, this study aims to explore and analyze the methodological actions that will establish the basis for implementing transdisciplinary approaches through a critical perspective in Higher Education. Thus, the research approach taken in this study is qualitative, as it aims to determine the methodological principles for implementing the transdisciplinary approach and critical pedagogy in HE. Data for this study were collected using a case study at the University of Lleida (Spain) involving two university degrees (Social Work and Industrial Engineering). The experimental work presented here provides one of the first investigations into incorporating a transdisciplinary approach mixed with critical pedagogy to evidence why Higher Education may need new ways of teaching and organizational changes.

This chapter is structured in four parts. The first part refers to conceptualizing the different disciplinary approaches and emphasizing transdisciplinarity. In turn, the Transpraxis approach is explored as a critical conceptual framework for applying new forms of teaching within HE. Next, the methodology of this research is presented. Specifically, the context, the participants, the educational proposal, the procedure,

and the data collection are detailed. This section ends with the main characteristics that emerged through the categorization of the data. This data categorization shapes the following section based on the results. This section explores the different methodological, interpersonal, and teaching aspects implemented in the experience. Thirdly, the discussion of the results is presented. This section presents the main characteristics that a critical transdisciplinary project can have. Finally, the main conclusions of this research are presented.

2. Literature review

Teaching and training spaces are usually distributed through curriculum standardization and top-down governance [22]. Through this text, we are made aware of how Neoliberalism and mercantilism promote hierarchical disciplinary systems. Consequently, subjects and disciplines that do not contribute to mathematical utility or economic rationality are no longer considered necessary. Additionally, such an approach leads to conceptual and cultural ignorance through taking tests, memorizing information, and the inability to question information [22, 23]. In this context, what can be done to subvert this approach to university teaching and training?

There is a need for educational centers to become spaces for thoughtful reflection, where the societal, historical, and cultural relationships that influence educational practice are visible [24, 25]. The result is the transformation of students into active citizens committed to society [26, 27]. Moreover, students and their contexts should be provided with optimal conditions for critical learning [28]. As educators, we can facilitate learning situations by reflecting upon the social aspects of our professional practices using critical thinking and social reflection [29]. It is also possible to mediate knowledge and situate learning through this approach [30].

Higher Education has evolved knowledge by distributing curricula into specific disciplines, contributing to a deeper understanding of the field. These distinctions, however, have distanced knowledge from an interconnected perspective with other domains of knowledge [31]. According to [32], parceled and quantitative thinking structures lead to blind intelligence. This is because each discipline has become its category of knowledge, defining its linguistic, technical, and sometimes theoretical boundaries. It has been suggested by several authors that disciplines should be "greened" and contextualized by taking into account the cultural and social circumstances in which they are situated [33, 34]. The question is, what approaches were attributed to the disciplines, and which approaches are present in our classrooms today?

2.1 Disciplinary educational approaches

The literature reveals a variety of disciplinary relationships. **Table 1** provides an overview of different approaches to knowledge innovation, and their prefixes indicate the degree of porosity of the discipline. It is common to find them in a great deal of research in education and HE. However, the use of disciplinary, multidisciplinary, and interdisciplinary approaches does not facilitate the creation of a systemic approach consistent with everyday habits and lifestyles [35]. Furthermore, these approaches do not provide a holistic view of the problem. Interdisciplinary approaches are the closest to this concept, although they do not allow knowledge transfer across disciplines. Accordingly, a transdisciplinary approach is advocated by several authors [36–38] as a comprehensive and integral element that enables fields to be "crossed".

Disciplinary approach
Concentrates on a specific issue within a single discipline. Based on theoretical explanations and a positivist perspective, a methodology is developed that removes a single object from its context and rejects its connection to other elements.
Multidisciplinary approach
As a result of focusing on a common problem, several disciplines are considered. As each discipline intervenes for a different purpose, it is pertinent to consider that the objectives differ between disciplines. Consequently, it is possible to define the conclusions of such an approach separately.
Interdisciplinary approach
It is intended to investigate development problems with and from disciplines that share a common goal and problem. The research process involves all disciplines. Consequently, it enables cooperation between various disciplines, thus allowing bridges to be constructed between them.
Transdisciplinary approach
The project's scope extends beyond typical disciplinary boundaries and the fragmentation of knowledge. The solution to societal problems is based on a holistic, integral, systematic, and ontological approach.
Note. *Own elaboration.*

Table 1.
Disciplinary approaches.

2.2 Transdisciplinary approach

The prefix 'trans' indicates that a transdisciplinary approach extends beyond the discipline. There have been a variety of interpretations of the concept by different disciplines. As a result, different fields have coined this concept. This approach gives it a specific meaning and defines the term as a novel approach to creating knowledge through empirical, interpretive, and critical means [39]. Transdisciplinarity must be based on complexity and a holistic perspective to transcend mono, multi, pluri, and interdisciplinarity. Therefore, this systemic approach considers the social, cultural, and political contexts [40]. Following **Table 2**, transdisciplinary knowledge is based on three axioms.

Transdisciplinary praxis can be defined by these three [41]. Transdisciplinary praxis is defined as 1) situations where dialectical participation is a commitment, 2) experiences that allow moving beyond comfort zones through multiple perspectives, 3) investigating in formal and informal contexts, 4) valuing complexity as a factor that enhances relationships, 5) being humble and reflective, and 6) promoting collective action based on community and critique of power. As a result, this praxis concretizes transdisciplinary initiatives between society, organizations, citizens, and universities [42]. Additionally, the horizontal concretion of these elements enables the implementation of educational proposals consistent with social evolution, integrating knowledge and action in the same manner [43, 44]. According to [45], Transpraxis strengthens the concept of transdisciplinary praxis and emphasizes the reflexivity of educational approaches. [46] reflexivity is a critical self-evaluation of each individual in a particular situation [47]. Reflection differs from this in that it places the person reflecting outside of the process of reflection. Therefore, reflexivity enables us to develop strategies for questioning our actions, thoughts, and values [48]. The use of a transdisciplinary approach combines all the qualities necessary for critical training and education, which allows us to establish points of connection with critical pedagogy.

Ontological axiom
In essence, it involves recognizing that reality is composed of several levels interacting with one another (externally and internally).
Logical axiom
This axiom reconciles contradictions, and different forms of knowledge are integrated into new knowledge, utilizing tertiary logic.
Epistemological axiom
As a result, knowledge is viewed as an emergent, embodied, and always-in-flux phenomenon.
Note. *Own elaboration.*

Table 2.
Axioms of the transdisciplinary approach.

2.3 Transpraxis approach (TA)

As a conceptual current, the Transpraxis Approach is closely related to critical pedagogy in that both aim to develop attitudes that support social justice, equality, freedom, and the rights of individuals [49]. Furthermore, it allows for the definition of professional practices that create a dynamic, fluid, and change-oriented society [50]. Consequently, such practices must foster a critical and liberating consciousness [51] capable of subverting dominant approaches and exploring education from a horizontal and egalitarian standpoint. Only its transdisciplinary character allows such a response, given its practical, reflexive, and non-binary nature [52]. A critical pedagogy employs the transdisciplinary perspective to transform the school into an agent of social change for the community. Thus, rhizomatic experiences can be generated for teachers and students due to this multidimensional structure of reality [53]. Additionally, it provides them with an opportunity to contribute to the solution of problems in complex social situations. It is possible to achieve such solutions by engaging in collaborative, creative, and interactive thinking [54]. Therefore, as [55] states, understanding the world requires more than memorizing knowledge, but rather the quality of one's ethical and moral relationships with others.

Critical pedagogy and Transpraxis share a relationship. It is because both aim to help students establish relationships with the environment and themselves and provide them with a holistic vision relevant to their daily lives. Therefore, both theories interpret knowledge as global and connected to learners' everyday lives [56]. Consequently, students are active participants in the learning process and can solve real problems in their everyday lives [57]. In turn, connecting with their environments deconstructs dominant discourses and empowers social reconstruction to achieve social justice. Teachers are also encouraged to develop dialogical educational situations based on different knowledge and understandings of critical pedagogy and the Transpraxis Approach. Furthermore, they seek to create training experiences that can situate learning in and for communities to ensure that a teacher is connected to the community [58]. As a result, both approaches conceptualize learning as an emancipatory and humanizing process.

According to a literature review, transdisciplinary educational practices are lacking among university programs in diverse fields of knowledge. As a result of these

educational practices, critical pedagogy and ethical and responsible learning methods were promoted. As a result, the study's main objective is to describe the methodological principles for implementing the Transpraxis Approach (TA) in Higher Education (HE). A specific set of objectives is proposed to accomplish this: 1) Designing the methodology for HE subjects based on TA; 2) Analyzing the implementation of TA in HE subjects; 3) Determining the methodological principles for the implementation of TA in HE.

3. Method

The methodology of TA-based assignments in HE is designed and implemented through participatory action research to provide a basis for subsequent analysis. Additionally, researchers take on the role of teachers, continuously analyzing and reflecting on what occurs through direct contact with students.

3.1 Context and participants

According to **Table 3**, during the 2020–2021 academic year, a case study was conducted at the University of Lleida in two curriculums: a) "Geography and History," part of the Degree in Social Education; b) "Industrial Automation," part of the Degree in Industrial Engineering (Electronics and Mechanical).

In total, 160 students participated during their second academic year—78 students from the Social Education program and 82 from the Industrial Engineering program. Regarding the Social Education students, 80% identified themselves as females and 20% as males. They ranged in age from 19 to 25 years of age. Most of the participants were of European origin and, specifically, of Spanish nationality. There were 95% male and 5% female engineers in the engineering group. In terms of age, they ranged from 19 to 40. All students were of European descent, despite their different nationalities, including two students from Italy, one from Macedonia, and one from Ireland.

3.2 Educational proposal

Based on a literature review conducted between 2016 and 2018, the subject methodology was designed to follow the critical elements of [47, 48] as shown in the following characteristics:

Subject	Geography and History (GeH)	Industrial Automation (IA)
Grade	Social Education	Industrial Engineering
Curse	2nd	2nd
Type	Compulsory	Compulsory
Credits	8 ECTS	8 ECTS
Semester	2nd	2nd
Students	78	82
Total	160	
Note. *Own elaboration.*		

Table 3.
Characteristics of the subjects and participants.

• Co-production of knowledge through projects

Establishing groups with a maximum of six members and a 50:50 balance between the two degrees for the collaborative production of knowledge [59, 60].

• Significant learning

The project aims to develop proposals for social and technological solutions to transform the city's historical center into a space for inclusion within the university's municipality [61].

• Experiential methodology

Sensory ethnography [62] analyzes social, cultural, bodily, and sensory discourses within urban spaces [63]. This technique aims to have students interview citizens to gather information about real issues. The students' projects were aligned with the SDGs (Sustainable Development Goals) [64].

• Linking practice with theory

Key aspects include technological innovations with critical social benefits and the analysis of changes in space and time, together with how the population perceives these changes [65] in the project's development.

• The role of the teacher as a "guide"

The teacher's job is to create the learning conditions so that the students' experiences are at the heart of the learning process [66].

• Dialogic spaces

Discussion sessions are proposed among all students on the conception of solutions to promote an inclusive city and how technological innovations contribute toward an inclusive city [50].

• Critical perspective

The artist and activist Daniel Andújar will participate as a catalyst to question the status quo of the students' projects, providing a more critical vision through his artistic works based on social criticism and inequality in the information society.

• Interactive process

It is intended that the creation of the project is not linear but that the experiences contribute to its development and continuous improvement in all its theoretical and practical aspects in a cyclical way between teachers and students.

3.3 Procedure

Students and teachers of both subjects met weekly for one hour in the classroom to discuss both subjects during the fifteen weeks of teaching in the second term of the 2020–2021 academic year. A further twelve hours of autonomous work were allocated to each group to finalize the proposal or investigate their project. The three teachers who participated in the research did so voluntarily. Social Education and Industrial Engineering students signed the authorization form in which they consented to participate in the joint project and allowed their data to be used anonymously.

Figure 1.
Message found and snapshots during sensory ethnography.

3.4 Data collection instrument

A data collection instrument was developed from the student projects and their related written work. In this written document, there were six parts: 1) Approach to the problem, 2) Design of the intervention, 3) Implementation of the intervention, 4) Results and reflections on the intervention, 5) Conclusions, and 6) References. In addition, as shown in **Figure 1**, these papers included the intervention proposal, describing how the trans-disciplinary projects had been developed through sensory ethnography [67].

As discussed in the section on the characteristics of the subjects, sensory ethnography allowed the exploration of urban environments. As a result, it was possible to identify which issues could be addressed from a social and technical standpoint. The research included 27 projects in total (see **Table 4**). The connection between projects and SDGs is based on two perspectives: SDGs created by citizens who will benefit from a project and SDGs incorporated into the project during its development.

Project	Thematic	The proposal and SDGs involved
1, 3, 19, 24	Leisure areas	Create leisure spaces in the historic center to enhance the social relations of the people there.
7, 8, 13, 26	Domotics	Installation of sensors in different urban facilities to improve the way of life of the people living in these spaces
11, 12	Parking	Manage and provide parking spaces in the historic city center.
4, 17, 23	Urban lighting	Install light and presence sensor lighting in poorly lit streets and urban spaces in the city.
2, 6, 14, 25	Sustainable energies	Improve the energy efficiency of dwellings and other public or private spaces of the historic city center.
5, 6, 9, 15, 16	Attention to diversity	Create technological facilities in public spaces that enable the inclusion of all people.
18, 21, 22	Software applications	Design of applications to manage and improve social communication in public and private spaces
10, 20, 27	Recycling	Installation of recycling mechanisms in public spaces with low environmental impact and economic cost.

Table 4.
Characteristics of the subjects and participants.

3.5 Data collection instrument

Based on the steps shown in **Figure 2**, we used content analysis for analyzing student work.

Based on the written projects generated by the students, the data analysis provides a wealth of qualitative - narrative - information showing both the positive and negative aspects of their experiences. According to [50, 67, 68] study of transdisciplinarity and transpraxis, we could extract dimensions consistent with lived experiences and improve the categorization of the data. [69] have identified categories in the results through a reflective critique of the validity of the instruments. Below is a **Table 5** that illustrates the categorization system used.
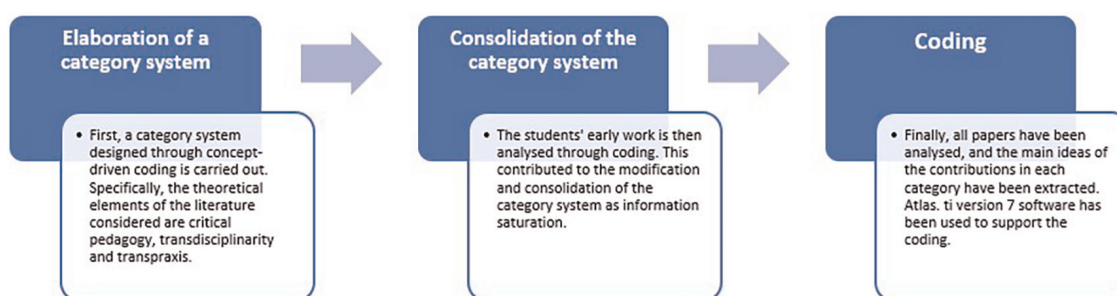
Figure 2.
Content analysis process.

Dimension	Category	Definition
Methodological aspects	Deconstructing discourses	It reveals and examines the discourses of power embedded in everyday practices in society.
	Revealing truths	It is making visible social minorities and approaches that exclude vulnerable people based on race, gender, sexuality or culture.
	Interaction during the process	Complex problem-solving is understood as changing, provisional, and movable elements. Therefore, so is their process.
Interpersonal aspects	Reflexivity approach	Becoming aware of and proposing questions based on a person's internal positioning while interacting with another person influences the experience's process and outcome.
	Deconstruction of binaries	It deconstructs the binary components that exist in society, to society, in order to intermingle them to define an inclusive space.
Teaching aspects	Dialogic communication	They are attentive to people's dialogs, regardless of their differences, recognizing and generating open, flexible, and inclusive forms of communication.
	Transcendent spaces of transformation	They are designing spaces of power resistance, reflection, and reflexivity in the experiences that are identified in everyday life.

Note. *Own elaboration based on [50].*

Table 5.
Characteristics of the subjects and participants.

4. Results

The results are presented in **Table 5** according to the category system. The students are not identified for ethical reasons but rather for the projects to which the quotations pertain. This section presents written transcripts of the physical projects and corresponds to a verbatim copy with possible grammatical errors.

4.1 Methodological aspects

Based on the results concerning the methodological aspect, it is evident that the students are aware of the connection between their professional practice and what happens on the streets. The 27 projects demonstrate the importance of deconstructing dominant discourses in society.

> *It is common for us to focus on the product rather than the discourses behind the product. As engineers, we should, however, consider the people who will be using the product, and because of the social gaze, we are now more aware of the discourses of power in society.*

> *The purpose of this project was to allow both grades to break out of their routines. As a result, they can develop their creative abilities and apply what they have learned.*

The results demonstrate how the participation of artist Daniel Andújar enhanced the deconstruction of discourses. It is evident from the results that his works have contributed to the reflection of social minorities and excluded groups. As a result of the projects, the university is not engaging in formative practices that reveal marginality and exclusion.

> *We became aware of how our upbringing influenced our view of society. We were forced to rethink our understanding of urban space after seeing Andujar's work and realizing that elements were invisible to us.*

> *Marginality, Social exclusion or Segregation. These terms were studied in the classroom, but this is the first time we have encountered them during training. As a result of Andujar's look and experience, we became aware of how hypocritical we can be with other members of society at times.*

This section demonstrates how the students' experience revealed that the project was not rigid and static but changed over time as their research progressed. Furthermore, the results show how the SDGs have made such transformations possible for students.

> *We have to reflect on our reality because of the SDGs. Our practices and approaches emerged as we discovered projects related to the SDGs.*

> *Our research used the SDG approach extensively because it helped us tackle real-life issues. As a result, the project was alive because the problems were alive.*

These results demonstrate a correlation between the arguments expressed by the students and other faculty members. Specifically, it illustrates that students perceive the university as a linear space, disconnected from reality. The challenge of this approach provided the opportunity for a change of perspective.

> *At university, we are used to solving cases on paper and in papers that do not make sense to us. These projects are being developed for the first time based on our experiences and realities in social and cultural contexts. We believe this is very significant.*

> *Our engineers are responsible for taking a realistic view of society and starting with reality. There is a strong presence of this approach in this project; therefore, it makes sense to apply it. It would benefit the university to have more projects of this nature.*

The following extracts from the written documents illustrate the main results of the methodological aspects of training, which were reflected in the results of the interpersonal aspects.

4.2 Interpersonal aspects

An essential aspect of interpersonal aspects is how this research project engaged two universities with different knowledge fields to collaborate on a single project. As a result of this approach, the students' prejudices and stereotypes about the other degree and the students taking it were broken down.

> *The first impression of the other degree was very damaging because we did not find any relation between social educators and engineering, as they are opposite careers. This adverse reaction was caused by the prejudices that exist in society.*

> *Collaborative work has been vital in this process. In the beginning, it was not very easy, as we thought it would not work because of the differences. However, finally, we realized that we must work collaboratively and understand all perspectives as professionals.*

It is evident from the written fragments that students deconstructed the fragmentation of disciplines that affected their understanding of the university. This was done to break away from the academic fragmentation of the curriculum. The following example illustrates this situation.

> *It is incredibly enlightening that the university uses a methodology that combines different disciplines; this teaches us that we should not work separately but collaboratively without prejudices or stereotypes.*

It is also significant to note that this aspect facilitates students' ability to reflect on their learning experiences. As students in both grades worked on deconstructing binary aspects, they demonstrated reflexivity. It is narrated in the following manner:

> *The experience has been gratifying, as it has provided us with different knowledge and points of view. Furthermore, this experience has made us realize that there is not just one truth but that we can create new things with these unions.*

> *We consider that the proposal shows us how we will need the collaboration of different professionals to carry out specific projects in the future. Therefore, this experience will be essential to respect and broaden our vision and knowledge.*

In the selected fragments, stereotypes and prejudices about their peers are deconstructed. Additionally, this resulted in self-criticism of their social and personal positions. As a result, these lively interactions impacted the workshop's methodological, interpersonal, and teaching aspects.

4.3 Teaching aspects

These results demonstrate the relevance of defining dialogic teaching as active listening and criticizing traditional university curricula. This result, in turn, led to self-criticism on the part of the students of both degrees.

> *As a result of these projects, we believe we are engaged in learning. Furthermore, as future professionals in this liquid society, all of us must have the opportunity to learn from everyday life and real-life experiences.*
>
> *Our project reflects on how the university operates within a Neoliberal framework in many instances. Therefore, it is impossible to overstate the importance of training and learning.*

As a result, the joint project has been influenced by the social and historical contexts. It is evident from these results that curriculum content should be linked to these contexts. In addition, this situation shows how one of the project's competencies has been social responsibility and civic engagement.

> *Linking our project with what we experienced in the space made us come up with a more coherent and inclusive proposal. In addition, we have gotten to know the realities around us.*
>
> *We have learned from the territory and the city for the first time. We have related curricular content to the realities that people live in their territories.*

As the students explain, culture and heritage play an essential role in education. Moreover, the students describe how the classroom should be a place of fundamental transformation, in which students can leave behind their experiences of memorizing and replicating industrial systems.

> *We have been able to work on the contents of these two subjects in a very dynamic, lively, and enriching manner as a result of the joint project. At the university, proposals are generated that goes beyond the traditional because the traditional does not work.*
>
> *This project has allowed us to understand how university education needs a change in the learning process, as these experiences make us think and go beyond.*

These examples demonstrate the importance of promoting university training that creates transformational learning environments. Here is an example of one of the transformation projects that aimed to generate self-sustaining modules for seasonal workers in the city of Lleida. As shown in **Figure 1**, these students also conducted sensory ethnography in the historic center of Lleida, exploring the streets and finding this message: "Shelter for seasonal workers, now!"

Based on this message from the historic city center, the students developed a proposal to provide sustainable and easy-to-maintain spaces for people who do not have access to housing for various reasons. As a result of approaching this social issue from a transdisciplinary perspective, this group gained a thorough understanding of subsidy legislation. Furthermore, they proposed how it should be implemented in the city. As a result, the opportunity to work closely with Daniel Andujar on sensory ethnography became a reality. According to the members of this group, the approach is as follows:

> *We had done the sensory ethnography, and the street told us it wanted to. From there,*
> *we decided to carry out this proposal; we thought about institutional power and the*
> *power relations that it generates. The street itself showed us a reality ignored by the*
> *organs of power.*

As a result of research conducted by the two training groups, social educators and industrial engineers, the following proposal has been developed for the generation of temporary worker housing spaces in Lleida, in which different sensors are installed to enable the modules to be self-sufficient. The modules consist of a kitchen, a dining room, a laundry room, three bedrooms, and two bathrooms. The students developed a prototype of a self-sustaining facility based on the social needs they identified during their ethnographic research. A vital goal of this approach was to ensure one of the principles of the Universal Declaration of Human Rights: everyone has a right to well-being, including access to food, shelter, health care, clothing, and other essential social services. The emergency caused by Covid-19 has exacerbated the situation in Lleida's historic center. In addition, the fruit-picking campaign has exacerbated the problem of day laborers in the city, which is already recurrent. These workers often slept on the streets or were housed in tiny, poorly ventilated apartments. The extreme situation experienced during the pandemic is also an indication of social rejection and exclusion. The lack of coherent social policies and structures highlights the students' good reading of the city's problems.

This project illustrates an intervention in HE made possible through community involvement and the involvement of individuals who contribute to everyday life. Based on the study results, it is evident that higher education needs to rethink its methodological, interpersonal, and teaching aspects critically. From a critical perspective, this entails defining a Transpraxis Approach that is consistent with the evolution of society.

5. Discussion and conclusions

Using the research findings, it has been possible to describe which methodological aspects should be considered when designing an educational proposal in higher education. This is due to the teaching assistant. These methodological aspects have been delineated through principles by analyzing the content of joint projects involving students from different disciplines.

On the methodological front, joint projects have played a significant role in developing the TA to promote relevant professional practice in each degree through exchanging and disseminating knowledge between the two disciplines. According to the EHEA, this approach corresponds to specific and transversal competencies [70]. One of the objectives of this research included the ability to identify, pose, and solve problems in real-world situations. Using sensory ethnography, students identified and provided solutions to urban social problems. They deconstructed different social and dominant discourses, betting on real projects rooted in their communities [71] and realizing situated learning [72, 73]. In turn, the work with the artist Daniel Andújar and SDG emphasized critical thinking about the lived reality of the historic center and its community [74].

It is evident that the importance of exploring collaborative work in university education cannot be overstated [75]. Therefore, students can identify self-criticisms of their processes and analyze their positions regarding other degrees, creating a sense of re-flexibility. Additionally, the various excerpts emphasize the importance of collaboration between different grades to exchange knowledge across disciplines. As a

result, learning can be democratized [76], and various social boundaries can be deconstructed. Therefore, it is not significant where the discipline comes from, but rather understanding differences to propose educational practices that contribute novel knowledge and methodologies to university education.

In teaching, working with sensory ethnography enabled students to relate the research to their everyday lives. By examining the fragments, it was easier to see how the curricular content was shaped by the experience of living in the territory and the historical context. As a result of understanding the context's social relations, they gained a more comprehensive understanding of the power relations experienced in these spaces (gentrification, regeneration, or social exclusion). As a result of these observations, it was possible to investigate the competency of engagement with the socio-cultural environment within university education. It is possible to understand teaching as a space that fosters critical thinking and social responsibility using a teaching model based on dialogical communication.

As a result of these findings, the inclusion of content from practice and personal experience is further supported. Students approached their projects with an awareness of the potential impact they might have on the everyday lives of those living in the historic center. This was because they brought their subjects closer to the lived realities of the historic center. Nevertheless, the results demonstrate the importance of working within a heritage context. As a result, we can define real projects that align with society's needs today. It is possible that dealing with the heritage context results in more open and enabling situations. It is connected to the way of life of the residents of these areas.

Based on this combination of findings, it appears that HE should be transformed into a space for debate, critical knowledge production, and the connection of training to relevant social issues. Accordingly, based on the research objectives and the analysis of the main results, ten principles are outlined as a dialog representing an interpretation of the data. Using critical pedagogy in HE, the Transpraxis Approach is built on the following principles to implement a transdisciplinary methodology.

1. Start from a specific problem, issue, or situation rather than from a discipline or area of knowledge.

2. Determine the problem to be solved to determine the diagnosis, research methods and strategies for action.

3. Identify the main dimensions of the problem by creating an order of priority.

4. Find out who are the people interested or affected by the problem or situation you want to address.

5. Convene stakeholders to be part of the research group from the beginning.

6. Establish relationships or connections between existing dimensions of the problem.

7. Analyze the effects of each of the dimensions of the problem.

8. Establish the connections between the various effects and dimensions of the problem.

9. Agree on the priorities of the work, the timetable, and the responsibilities of each of the research participants.

10. Propose solutions based on networking in order to continue researching and improving.

This self-developed decalogue has been developed based on the experience gained during this project. However, these findings cannot be generalized, and the case study may limit their applicability. Therefore, it is necessary to conduct further research in order to gain a complete understanding of the role of teaching assistants in university education. Consequently, this research will continue during the academic year 2022–2023 by proposing a Transpraxis Approach between the Degrees in Primary Education and Digital Design and Digital Technology at the University of Lleida. Through this continuation, these principles can be verified. By doing so, we can transform university centers into learning environments. These centers will be critical of society and in harmony with the way of life of its citizens.

Higher Education has not explored a novel conceptual and practical framework due to this research. Instead, this study illustrates the importance of using critical pedagogy conceptual frameworks to implement the Transpraxis Approach. As well as offering innovation in curricular understanding, it commits to a view that moves away from mercantilist concepts that are disconnected from current reality. Therefore, this research provides a window into understanding university education as an enabling and transdisciplinary element that responds critically and inclusively to real-world issues.

Conflict of interest

The author declares no conflict of interest.

Author details

Daniel Gutiérrez-Ujaque
University of Lleida, Lleida, Spain

*Address all correspondence to: daniel.gutierrez@udl.cat

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