



PARMA SUMMER SCHOOL

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Food Safety Aspects of Integrated Food Systems

Introduction in Transdisciplinary Methodology for Integrative Food Systems and Environmental Safety

Why TRANSDISCIPLINARITY?

UNPRECEDENTIAL INCREASE IN THE NUMBER OF DISCIPLINES:

- 1300 - 7 disciplines
- 1950 - 54 disciplines
- 1975 - 1845 disciplines
- 2011 - over 8000 disciplines

(National Register of Scientific and Technical Personnel, National Science Foundation / NSF archives, USA)

The confusion of prefixes – order in terms

- **MULTIDISCIPLINARITY (MD)**: the study of an object through several disciplines at once (eg: studying a painting from the perspective of art history, the history of religions, chemistry, geometry, etc ...)
- **INTERDISCIPLINARITY (ID)**: refers to the transfer of methods from one discipline to another and there are:
 - applicative degree (eg: methods of nuclear physics transferred to medicine lead to the emergence of new treatment methods)
 - epistemological degree (eg: the transfer of the methods of formal logic in the field of law generates specific analyzes of the epistemology of law)
 - generative degree for new disciplines (eg: the transfer of mathematics in physics generated mathematical physics, etc.).

Obs. Although these two types of approaches go beyond the limits of the disciplines, their finality remains within the proper framework of the disciplinary research.

- **CROSSDISCIPLINARITY (CD)** – in my opinion, CD is a hybrid between MD and ID – so the results remain in the frame of positivism, too (finally, CD can not be an integrative method).
- **INDISCIPLINARITY** - transgressing disciplinary boundaries without adopting a methodology.

Transdisciplinarity (TD) – definition:

TD looks, as the prefix “trans” indicates, at the same time

-between disciplines,

-what passes through them and

-what is beyond any discipline.

Its finality consists in understanding the current world,
one of the imperatives being **the unity of knowledge.**

Definition of transdisciplinarity set out by Organization for Economic Co-operation and Development (O.E.C.D.)

Transdisciplinarity is a mode of research that integrates both academic researchers from unrelated disciplines including the natural sciences and the social and human sciences - and non-academic participants to achieve a common goal, involving the creation of new knowledge and theories. Drawing on the range of fields of scientific and non-scientific knowledge such as local and traditional knowledge, and cultural norms and values, it aims to complement and transform scientific knowledge for the good of society. It cuts across the traditionally separate fields of science and practice and advances both simultaneously. (OECD, 2020)

Etymology

THERE IS A CONSTANT CONFUSION BETWEEN THE TERMS:

- **METHOD** - procedure, recipe, path to follow
 - * *meta* (with, near, similar to base)
 - * *hodos* (path)
- **METHODOLOGY** – study / logos of methods
 - * *methodos* - method
 - * *logos* – study (reason, discourse)

Obs:

1. *One methodology is compatible with an infinit number of methods*
2. *An exemplary case is the methodology of modern science formulated by Galileo Galilei*

Disciplinary boundaries

- **We define disciplinary boundary as the totality of the results – past, present and future – obtained by the laws, norms, rules and practices of a given discipline.** Of course, there is a direct relation between the extent to which a given discipline has been mathematically formulated and the extent to which this discipline has assumed a boundary. In other words, the more mathematically formalized a given discipline is, the more this respective discipline has a precise boundary.
- https://ciret-transdisciplinarity.org/ARTICLES/Nicolescu_fichiers/DisciplinaryBoundaries.pdf
- Léo Apostel, Guy Berger, Asa Briggs and Guy Michaud (ed.), L'interdisciplinarité – Problèmes d'enseignement et de recherche, Centre pour la Recherche et l'Innovation dans l'Enseignement, Organisation de Coopération et de développement économique, Paris, 1972

Brief history (1)

- **1970, NICE: INTERNATIONAL COLLOQUIUM: “INTERDISCIPLINARITY - EDUCATIONAL AND RESEARCH PROBLEMS IN UNIVERSITIES”**
 - **O.E.C.D. and French Ministry of National Education;**
 - Jean Piaget: proposes **the term “transdisciplinarity”**, aiming at the transition to a higher stage of interdisciplinarity, through which to cross the boundaries between disciplines
- **1987 - Establishment of the International Center for Transdisciplinary Studies and Research (C.I.R.E.T. – Paris);** - starting from this center, there is a multiplication of transdisciplinary research and institutional activities worldwide
- **1991 - Establishment of the Reflection Group on Transdisciplinarity under UNESCO** - a strategic center directing transdisciplinary activity at the international level and - a link between different groups, transdisciplinary associations and international bodies
- **1994 - First World Congress of Transdisciplinarity,** - Convento de Arrabida, Portugal, November 2-7

Brief history (2)

- **Charter of Transdisciplinarity** (B. Nicolescu, E. Morin and Lima de Freitas, Ed. Du Rocher, Monaco – 1994)
- **International congresses:**
 - 1997 – „**The university of tomorrow? Towards a transdisciplinary evolution of the University**”, Locarno, Switzerland
 - 2000 – „**Transdisciplinarity: Joint Problem Solving among Science, Technology and Society - an Effective Way for Managing Complexity**”, Zurrich
- 1997-2002: establishment of various transdisciplinary bodies, important actions in Brazil, Switzerland, Spain, Venezuela, Argentina, Canada, Romania, France
- 2004: „**Perspectives on Higher Education in the 21st Century**”, Turkey
- 2005: **Transdisciplinary workshop at the University of Stellenbosch**, South Africa
- 2005: **Second World Transdisciplinarity Congress** Vitoria / Vela Velha, Brazil, September 6-12

Brief history (3)

- Ongoing book collections - "Transdisciplinarity", Editions du Rocher, Monaco
- 38th International Congress of the Romanian-American Academy, Los Angeles, USA, 24 July 2014: **The Need for Transdisciplinarity in Higher Education**
- 10th World Congress "The Human Being: its Nature and Functions", International Society for Universal Dialogue, Craiova, Romania, 4 July 2014: How Can We Enter in Dialogue? Transdisciplinary Methodology of the Dialogue Between People, Cultures, and Spiritualities
- European Week of Astronomy and Space Science, Geneva, Switzerland, 2 July 2014: **The Transdisciplinary Education and the Challenges of the XXIst Century**
- The ATLAS 2014 International Conference "**The Science - Applications and Transdisciplinary Education**", Asia University, Taichung, Taiwan, 9 June 2014: Transdisciplinary Bridges between Science, Culture, Spirituality, and Society
- International Congress "**The Ethics of Business and Leadership in a Transdisciplinary Context**", 5th Annual Griffiths School of Management International Conference, Oradea, Romania, 15 May 2014: **Necessity of Transdisciplinarity for Facing the Challenges of the 21st Century**

Brief history (4)

- European Meetings on Cybernetics and Systems Research "Civilization at the Crossroads? Response and Responsibility of the Systems Sciences", Vienna, Austria, 22-25 April 2014: **Methodology of Transdisciplinarity: Its Importance for Building Sustainable Futures**
- Charter College of Education, California State University of Los Angeles, Los Angeles, USA, February 27, 2014: **Transdisciplinarity and Its Approaches to Education**
- International Congress "Teachers for the Knowledge Society", Sinaia, Romania, October 25, 2013: **Transdisciplinary Education for the 21st Century**
- International Workshop "Thinking Europe / Penser l'Europe", National Foundation for Science and Arts, Romanian Academy, Bucharest, Romania, October 4, 2013: **Transdisciplinarity and Indisciplinarity**
- International Workshop "Studying the Environment - Working Across Disciplines", Rachel Carson Center for Environment and Society, Lake Kochel, Germany, July 19, 2013: **Multidisciplinarity, Interdisciplinarity, and Transdisciplinarity - Similarities and Differences**

Brief history (5)

- The Academy of Transdisciplinary Learning and Advanced Studies (ATLAS)
- Transdisciplinary School – at University of Technology Sydney - *“By bringing together different perspectives, data, information, tools, concepts, techniques and theories from multiple disciplines, we can evolve our thinking and discover new ways to tackle problems together.”* (<https://www.uts.edu.au/about/td-school>)
- The Third World Congress of Transdisciplinarity – *virtual modality* – 2020-2021
- The Third World Congress of Transdisciplinarity – *face-to-face modality* – Mexico City, nov. 2022
- **Constitution of the world transdisciplinary organism – in working now** (many groups from all continents, from all domains are working together to establish the functional framework responsible for generating new methods for sustainability and for other current issues which confirm the need of a new type of responsibility/ approach)

Transdisciplinary Doctoral Research Programs in the World

- **Full transdisciplinary studies – in all domains**
 - Babeş-Bolyai University Cluj-Napoca, Romania, Faculty of European Studies, European Paradigm Doctoral School
- **Transdisciplinary doctoral program - sustainable development studies (food safety, agriculture, biodiversity, environment)**
 - Stellenbosch University, South Africa
- **Transdisciplinary doctoral program - engineering, technical systems**
 - Texas Technical University, USA

Transdisciplinary doctoral program – sustainability Stellenbosch University, South Africa (example)

- “This new Doctoral Program is offered by **Stellenbosch University, South Africa** in partnership with its strategic partners **the Council for Scientific and Industrial Research (CSIR), Human Sciences Research Council (HSRC) and Sustainability Institute (SI)**. This transdisciplinary PhD Program has emerged in response to the global challenge of sustainability and the need for knowledge of complex inter-related social-ecological systems. In order to understand and be able to respond to such a challenge, we need new ways of knowing and producing knowledge that will make it possible to develop an integrated understanding of such systems. Complex global sustainability challenges relating, for example, to poverty, energy, water, waste, food security, biodiversity, urbanization, conflict, gender, values and identity cannot be understood and addressed using mono-disciplinary approaches. **Sustainability is a transdisciplinary challenge.** Engaging with this challenge, the Doctoral Program provides participants with a unique experience of learning beyond disciplinary boundaries. (https://ciret-transdisciplinarity.org/doctorat/PhD-Prog_SouthAfrica.pdf)

TSAMA Hub (example)

- Stellenbosch University support a proposal to establish a **new ‘hub’ for transdisciplinary and sustainability studies** that was jointly developed by the Sustainability Institute, the CSIR and the School of Public Management and Planning.
- The proposal for the so-called TSAMA Hub emerged out of discussions initiated in 2005 by the then Dean of Science, Prof. Albert Van Jaarsveld. Academics from various Departments at the University and researchers from the CSIR came together to discuss **the need to develop high level analytical, methodological and modeling skills for transdisciplinary research into the major sustainability challenges we face.**
- The TSAMA acronym emerged from these discussions and stands for **‘transdisciplinary, sustainability, assessment, modeling and analysis’**.
- <https://www.sustainabilityinstitute.net/5033-transdisciplinarity-and-sustainability-new-partnerships/>

TD school / programs in every university / institution (desirable / purpose)

UTS example (<https://www.uts.edu.au/about/td-school>)

- In line with the university's goal of **developing a distinctive capability around transdisciplinarity by 2027**, the Faculty of Transdisciplinary Innovation (FTDi) has become a central, pan university unit under a new name, the TD School.
- The first of its kind in Australia, the TD School is on a mission to instigate **a revolutionary change in education and research through transdisciplinary innovation.**
- People with passion will make an impact on the great social challenges of our time. They're collaborative, open-minded and eager to learn. Building on rich ways of knowing across the disciplines, TD thinkers challenge the status-quo and prove to the world that anything is possible when we work together. With world-class educators and expert local and international industry, government and community partners at the helm, our school is full of ample opportunities for those involved to evolve their thinking, harness the power of creativity and find solutions to complex problems, big and small.

Interested parties engagement (UTS example)

- **Industry engagement is central to collaborative, participatory - transdisciplinary education.**
- **Teaching and learning practices that draw knowledge from all disciplines**, both in and outside traditional academic institutions, to generate creative and novel approaches to complex problems. **Work integrated project-based learning** is at the centre of the teaching and learning engagement with industry. For research, TD School explores emergent practices and knowledge with industry across the focus themes.
- A TD School looks to engage with a wide range of industry partners to consider challenges and innovation across the sectors. There are welcomed **industry, government and community partners in this transdisciplinary ecosystem.**

International Center for Transdisciplinary- Integrative Application and Research (CIACTI)

- **The intention of CIACTI** is to re-establish the fields of work of the current rule of law through integrative processes of re-instrumentalization of the respective fields of activity, in the perspective of a new epistemological paradigm - the transdisciplinary-integrative one; the processes will be trans-institutional, trans-political and trans-partinical.
- **The main lines of activity:**
 - Establishment of trans-institutional working networks with professionals from all areas of the rule of law - with the support of scientific conferences, round tables, debates (sponsorship)
 - Implementation of the new paradigm at the level of working areas (ministerial, legislative, judicial), with training of trainers including workshops with the acquisition of know-how in the new perspective (non-financial);
 - Integrative transdisciplinary projects (non-refundable funding).

Transdisciplinarity – generalities and applicability in public institutions / administrations (adaptable course / formation for diverse areas) - CIACTI proposal (1)

Professional new competences / new skills /new abilities:

- Integrative approach of all disciplines and activities in the respective working area; optimal interconnection of key factors in the activity;
- Coordination capacity in multidisciplinary areas of interest, avoiding overlaps and gaps in the management of administrative-institutional / inter-institutional processes;
- Ensuring an optimal management of decisions within the administrative-institutional act;
- Learning the "transdisciplinary attitude";

Integrative dynamic understanding of the administrative phenomenon, with the creation of transdisciplinary concepts and working tools in the field.

Transversal new competences CIACTI proposals (2)

- Professional development combined with other competencies of interest: from social, legal and legislative domains, language and communication, international and European relationship, sustainable development, areas related to natural and human sciences;
- Increased affordability of related areas: law, economics, sociology, education sciences, European studies, technical and environmental news, health, arts and personal development, etc .;
- Openness to a professional "cross-disciplinary" path and continuous education, of creative type; understanding the deontology of culture as a whole;
- Adequate management of professional risks in activity at local, regional and global administrative-institutional context;
- Promoting programs and projects in the sense of integrating the administrative act with the latest cultural approaches that can develop the administrative-institutional systems;
- The effective generation of strategies in the public administration, improving the administrative act and its relation with the concrete community to which it is addressed.

TD workshop on concrete situation /fields CIACTI proposals (3)

- **General objectives**

1. Theoretical aspect: acquiring basic transdisciplinary knowledge
2. Practical aspect: learning the practical features in the field of the new approach
3. Development of TD type attitude – the connection between TD theory and practice.

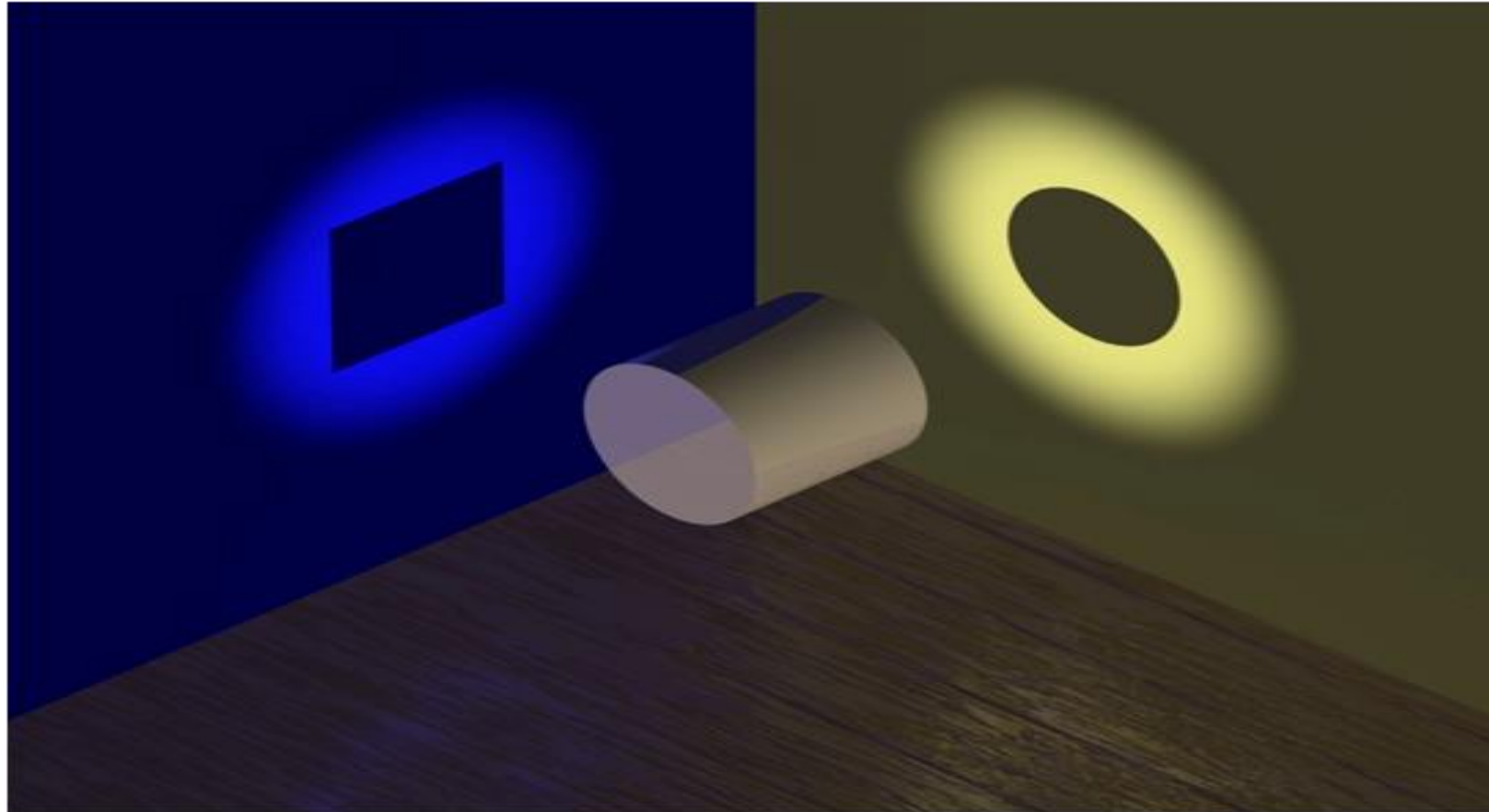
- **Specific objectives**

1. Understanding-learning the possibility of transgressing the artificial limits of disciplines and disciplinary activities, in the sense of obtaining an integral vision on the issues within the multidisciplinary areas of work that make the field of activity and interest of any specialist;
2. Understanding the possibility of transgressing the institutional and inter-institutional artificial departmental structures;
3. Creating dynamic, integrative personal professional models regarding the future administrative activity (dynamic sketches / benchmarks).

Formation items CIACTI proposals (4)

- 1. General presentation of the course, introductory notions
- 2. The contextual and methodological history of the emergence of the transdisciplinary approach
- 3. The fundamental pillars of transdisciplinarity / basic notions of TD
- 4. Attitude, between theory and practice: the foundation of a new development paradigm
- 5. Positivist and anti-positivist principles of culture; creative networking as a dynamic, integrative principle
- 6. Integration - fundamental notions
- 7. Integrative-transdisciplinary research method for establishing a „model”; outlining of an integralist-transdisciplinary model of activity - with integrative re-instrumentation of activities (avoiding gaps and overlaps in terminology / activities).

Transdisciplinarity (suggestion) “ternary methodology”



Conclusive ideas

- The role of networks in the creative implementation of TD
- Through TD networking – we generate new instruments for institutional / trans-institutional activity
- Complexity and Transdisciplinarity are strongly related to the importance of an integrative language for coherent semantics / terminology in the system
- For the complex involvement of TD in the field of Food Safety - Biodiversity - Environment it is necessary to create coordinated networks with TD formation (training of trainers) with the consensual development of new tools / trans-institutional instruments
- The development of TD Research (TDR) networks implies all interested parties and it is under the exigencies of „TD attitude“: rigor (rigor of language), tolerance (TD does not fight against any thinking but acts in the sense of its own “ternary” options) and openness (non-dogmatic approach of theories and new scientific experiences – integrative type science).

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