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Academic Presentation 'Navigating Transdisciplinary Communication: A Graduate Student's Perspective on Collaborative Research'

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Navigating Transdisciplinary Communication: A Graduate Student's Perspective on Collaborative Research

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Abstract

This presentation explores the perspective of a graduate student newly introduced to Transdisciplinary Communication (TDC) and its applications. It addresses the central question: How can one recognize the value of TDC, and how can it be applied effectively? As an inclusive approach, TDC is crucial for solving complex challenges by integrating diverse disciplinary insights, fostering collaboration, and improving research outcomes. This inclusivity ensures that all voices are acknowledged and valued in the research process.

Using a Constructivist Approach, the presentation highlights TDC's role in research through three main frameworks: (i) co-construction of knowledge through shared language, enabling cross-disciplinary expertise integration; (ii) the role of tools, social interaction, and goal alignment in collaboration; and (iii) TDC as a dynamic, non-linear process that fosters innovation and knowledge synthesis. Together, these frameworks offer a comprehensive understanding of how TDC enhances STEM research by encouraging diverse perspectives and addressing complex issues holistically.

The presentation begins with an introduction to the significance of TDC, followed by the graduate student's evolving perspective, informed by insights from the presenters' research. The discussion then transitions to practical strategies for identifying when and how to apply TDC, focusing on collaborative co-design. The session concludes with an open discussion, allowing participants to share their insights and experiences with TDC, particularly those new to the concept.

Keywords: *Transdisciplinary Communication (TDC), Collaborative Research, STEM, Constructivist Approach, Knowledge Co-construction, Co-Design, Interdisciplinary Collaboration, Innovation, Research Integration, Broader Impacts and Participation.*

Presented at: 28th World Multi-Conference on Systemics, Cybernetics, and Informatics (WMSCI 2024)¹

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¹ Source: <https://www.iis2024.org/wmsci/website/default.asp?vc=1>



New Jersey Institute Of Technology

*Navigating Transdisciplinary
Communication: A Graduate
Student's Perspective on
Collaborative Research*

Exploring the Essential Role of TDC in Collaborative Research from a Graduate's
Perspective

SirimuvvaPathikonda(Presenter)

Dr. James Lipuma

Dr. Cristo Leon



Understanding Transdisciplinary Communication (TDC)

- TDC is a holistic framework that enhances communication and knowledge exchange across diverse disciplines and stakeholders
- Uses various tools and strategies tailored to different interaction scales, from large meetings to small working groups.
- It supports collaborative problem-solving by facilitating knowledge sharing and integrating models like collective impact and social innovation. It adapts to various contexts, including education and social projects, ensuring effective engagement with different cultures and communities

Understanding Transdisciplinary Communication

- **Holistic Approach** : TDC integrates knowledge across disciplines, addressing complex issues by connecting diverse fields for comprehensive solutions
- **Effective Knowledge Sharing** : It ensures clear and efficient communication among stakeholders, facilitating the effective exchange and understanding of information.
- **Adaptable Tools**: TDC utilizes various tools and strategies tailored to both large-scale and small-scale interactions, meeting different communication needs.
- **Collaborative Framework**: By fostering active engagement and cultural sensitivity, TDC supports collaborative solution creation, aligning diverse perspectives and enhancing project outcomes.



Guiding Questions for TDC Application: How to recognize the usefulness?

Enhanced Collaboration : The usefulness of TDC can be recognized when interdisciplinary teamwork and communication improve, leading to more innovative and integrated solutions that would not have emerged from single-discipline approaches.

Effective Knowledge Integration : TDC is most effective when it facilitates merging diverse insights and expertise. This integration enhances research and problem-solving efforts, allowing teams to draw from a broader knowledge base and arrive at more comprehensive solutions

Graduate Student (Siri) Insights on TDC



Defining TDC

- A framework that facilitates effective communication and knowledge exchange across diverse disciplines, integrating various models and methods to address complex problems collaboratively.

Importance

- Integrates varied perspectives to solve complex challenges.
- Enhances problem-solving by leveraging expertise from different fields.

General Overview of Papers on TDC

TDC integrates multiple frameworks (e.g., collaborative innovation and collective impact) to foster effective communication. Emphasizes the need for adaptable tools and strategies for different interaction scales (large-scale meetings, small-scale feedback sessions).

Proceedings of the 17th International Multi-Conference on Society, Cybernetics and Informatics (IMSCI 2023)

Trans-Disciplinary Communication in the ChatGPT Age: A Systems Perspective

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ABSTRACT

In recent years, Trans-Disciplinarity (TD) has become increasingly recognized as a critical concept in contemporary scholarship and practice, especially in the emerging field of the metaverse. Despite its growing importance, however, the precise origins and meanings of the term remain somewhat elusive, and its relationship to systems thinking is still poorly understood. Consequently, further research is needed to clarify the definition and application of transdisciplinarity and explore its connections with related concepts such as systems thinking. By doing so, we can gain a broader understanding of how transdisciplinary approaches can be used to address complex problems in a variety of contexts and how they can contribute to advancing knowledge and innovation across disciplinary boundaries.

Keywords: Trans-disciplinary communication, digital age, metaverses, systems thinking, ChatGPT, transformative technologies

beyond disciplinary perspectives. The authors of this paper bring diverse disciplinary lenses to the conversation. Jasmin Cowin, from the Department of TESOL/Bilingual Education at the Graduate School of Education, Touro University, NY, USA, brings insights from the field of education and the importance of considering the social sciences lens in understanding human behavior and societal structures. Birgit Oberer, founder, and board member at the ETCOP Institute for Interdisciplinary Research, Austria, contributes expertise in interdisciplinary research, entrepreneurship education, and exploring emerging technologies. Finally, Cristo Leon, from the Office of Research & Development, NJIT, Newark, NJ, USA, contributes a perspective on research and development, further enhancing the trans-disciplinary nature of this paper. In our exploration, we will also discuss the potential of transformative technologies such as ChatGPT and the metaverse in facilitating TDC and knowledge integration. These technologies offer novel opportunities for collaboration, information exchange, and problem-solving across disciplinary boundaries. First, however, addressing concerns and ethical considerations surrounding integrating artificial

[1. Trans-Disciplinary Communication in the ChatGPT Age: A Systems Perspective](#)

Cowin, J., Oberer, B., Leon, C. (2023). Trans-Disciplinary Communication in the ChatGPT Age: A Systems Perspective. In N. Callaos, J. Horne, B. Sánchez, M. Savoie (Eds.), *Proceedings of the 17th International Multi-Conference on Society, Cybernetics and Informatics: IMSCI 2023*, pp. 138-144. International Institute of Informatics and Cybernetics. <https://doi.org/10.54808/IMSCI2023.01.138>

General Overview of Papers on TDC

Collaborative Convergence: finding the language for Trans-Disciplinary

Communication to occur

Leon, C., & Lipuma, J. (2022). Collaborative Convergence: finding the language for Trans-Disciplinary Communication to occur. In N. C. Callaos, N. Lace, B. Sanchez, & M. Savoie (Eds.), *WMSCI 2022 - 26th World Multi-Conference on Systemics, Cybernetics and Informatics, Proceedings* (pp. 147-150). (Proceedings of World Multi-Conference on Systemics, Cybernetics and Informatics, WMSCI; Vol. 1). International Institute of Informatics and Cybernetics.

3. COMMUNICATION

When doing TD research you don't necessarily need TDC but when you are doing collaborative convergence you need TDC because, without innovation in your communication, it is difficult to achieve integration. As you move to integration and innovation without TDC endpoints are not achievable. Without TDC the messages are lost in translation.



Collaborative convergence: finding the language for trans-disciplinary communication to occur

Convergência colaborativa: encontrar a linguagem para que a comunicação transdisciplinar ocorra

Convergencia colaborativa: encontrar el lenguaje para que se produzca la comunicación transdisciplinar

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ABSTRACT

The proper study of communication from existing models opens the doors to scientific research that allows exploring language and coding as an integral part of effective communication to generate new models that include Trans-Disciplinary Collaboration. The authors analyze the communication factors to describe the application of Trans-Disciplinary Communication.

This paper aims to define communication processes and their relationship with language, considering their impact on trans-disciplinary collaboration and innovation.

After conducting a systematic literature review, the article explored the concepts of communication, functions, language, and Trans-Disciplinary Communication. This led to its application in the convergence research approach presented in the Collaborative Convergence Pyramid.

Keywords: scenario, collaboration, communication, trans-disciplinary communication (TDC), idiolect, factors, convergence, SDG4 education.



Challenges and Learning Experience

Encountering and overcoming the barriers of varying disciplinary languages can be daunting.

- Leveraged TDC strategies to improve communication and collaboration in projects.
- Applied knowledge on effective tools and methodologies to enhance project outcomes.

TDC Questions as a Graduate Student

1. How does TDC influence **decision-making** processes in engineering management, especially in complex, multi-stakeholder projects?
2. How does TDC contribute to **fostering innovation** in engineering management, and what are the potential downsides of over-reliance on these disciplinary approaches?
3. What role does **cultural diversity** play in TDC within global engineering management projects, and how can I, as a manager, navigate these differences?
4. How can TDC be tailored to different **cultural contexts** to ensure effective communication and collaboration in international projects?

Engaging with Experts: When to Apply TDC

Overview

- Identify Complex Problems
- Share Experiences and Strategies
- Engage Diverse Stakeholders

Dr. James Lipuma

Dr. Cristo Leon



Effective TDC Applications



When to Apply TDC in Research

- **Complex Problems:** Use TDC when addressing multifaceted problems that require inputs from various disciplines, such as STEM education initiatives or social innovation projects.
- **Diverse Stakeholders:** Apply TDC when collaborating with stakeholders from different fields, including educational institutions, government bodies, and community organizations.

Effective *TDC Application*



TDC in Research Collaboration

- **Engage Early:** Initiate TDC strategies early in the project to build a shared understanding and align goals from the outset
- **Use Varied Communication Tools:** Tailor communication methods to the scale and needs of the interaction, whether through large-scale meetings or small working groups
- **Foster Open Dialogue:** Encourage continuous, open dialogue to share perspectives, address misunderstandings, and refine collaborative efforts.

Effective *TDC Application*

Example of Collaborative Co -Design

- **Newark STEM Project:** This project utilized TDC to co-design solutions with various stakeholders, incorporating feedback from educators, students, and community members to develop a STEM learning ecosystem tailored to local needs.

Importance of Aligning Goals and Fostering Social Interaction

- **Goal Alignment:** Ensuring all participants share common objectives helps unify efforts and enhance collaborative efficiency, **Social Interaction:**

Collaborative Convergent Pyramid (CCP)

- **Apply:** the CCP model to integrate diverse disciplinary insights and facilitate structured discussions, ensuring that collaborative efforts align and converge towards a cohesive research outcome.

Conclusion:

TDC Key Values For Students

Enhanced Collaboration

- TDC facilitates effective communication across disciplines, crucial for tackling complex, interdisciplinary challenges in both academic and professional settings.

Improved Problem -Solving

- By integrating diverse insights, TDC helps in ~~cre~~ating innovative solutions and addressing multifaceted issues more comprehensively.



Empowerment and Engagement

- It empowers participants by giving them a voice and fostering active involvement, leading to more meaningful contributions and outcomes.

Foster Ongoing Communication

- Maintain regular dialogue to promptly address challenges and enhance group dynamics.

Adaptability and Flexibility

- TDC provides tools and strategies that can be adapted to various research and project contexts, making it valuable for diverse and evolving needs.



Thank You

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