

TRANSDISCIPLINARY RESEARCH - Working in Teams beyond Boundaries

By

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ABSTRACT

Transdisciplinary research has a wide impact on bringing solutions to arising societal problems. The research involves not only the collaboration of experts across various disciplines but also non-academic stakeholders, which adds to the depth of the research. Transdisciplinary research handles complex problems that are beyond the realm of traditional research. Transdisciplinary teams, even though they face multiple challenges, try to function effectively towards a common goal. Transdisciplinarity is an ingrained element of social work and social work research. Social work, being a helping profession, can be equipped with knowledge from various disciplines. The emergence of social work may be rooted in transdisciplinary efforts. Fostering transdisciplinarity in projects and initiatives can lead to producing outcomes that can be used in solving social problems. Trans-disciplinarity brings forth a new idea, in a new way of approaching problems and generating solutions through combined efforts. There exists a need for the inclusion of multiple disciplines in projects of social nature. This paper looks into transdisciplinary research, its various parameters, process and its relation with social work.

Keywords: Transdisciplinary research, transdisciplinarity, transdisciplinary teams, knowledge producing teams, social work

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1. INTRODUCTION

Transdisciplinary research is an amalgamation of academia and other disciplines, which may or may not be related. It is bringing novel ideas and innovative thoughts into the existing knowledge. Transdisciplinary research work is towards achieving a common goal through the collaboration of various disciplines. It provides a new bridge of knowledge that can be utilised for the generation of solutions to societal problems. The knowledge of various subject matters together can bring forth a new range of concepts that can be used to construct new and effective learning processes and practices. Transdisciplinary research involves working across and beyond disciplines (Choi & Pak, 2006). Transdisciplinary teams will work towards the attainment of a common goal.

The advantage of employing a transdisciplinary model of research brings together experts from many disciplines allowing them to explore the complex causes and consequences of problems or inequalities (Gehlert, et al., 2010). Ciesielski and others (2017) state that perspectives in transdisciplinarity can help in the generation of better hypotheses which unidisciplinary efforts might not achieve. They also mention that TDR can better assess and interpret evidence and help in the development and coordination of policies and interventions (Ciesielski, Aldrich, Marsit, Hiatt, & Williams, 2017)

Schaefer-Mcdaniel & Scott (2010) states that one of the most significant advantages of using a TDR strategy is that it allows investigators to explore the problem under investigation from different perspectives and viewpoints. Other advantages include having broader access to literature on research, theory, methods of data collection, techniques of analysis and through that, providing them with more instruments to study a specific phenomenon. They also mention that TD teams have the ability to boost resources for other team members (Schaefer-Mcdaniel & Scott, 2010). Despite researchers being knowledgeable by their own discipline, the transdisciplinary approach allows them to transcend and work beyond boundaries and cultures of other disciplines to explore new realities, mutually share information, and address multilevel determinants of the problem they are attempting to solve (Gehlert, et al., 2010).

II. TRANSDISCIPLINARY RESEARCH

Transdisciplinarity and transdisciplinary research (TDR) are defined at various levels depending on its context. TDR can be related to the interchange between society and science; or the reflections of societal and economic processes (Hadorn, Pohl, & Scheringer, 2009). The term Transdisciplinary was coined in the 1980s to define a method of collaboration in which investigators work fully outside of respective fields (Gehlert, et al., 2010).

According to Harvard Transdisciplinary Research in Energetics and Cancer Center (TREC, 2014), transdisciplinary research is defined as “research efforts conducted by investigators from different disciplines working jointly to create new conceptual, theoretical, methodological, and translational innovations that integrate and move beyond discipline-specific approaches to address a common problem” (Harvard T H Chan, 2014).

TDR strives to integrate and eventually extend beyond discipline-specific concepts, techniques, and methods in order to speed up innovation and progress toward solving complex real-world challenges (Hall, et al., 2012).

According to Lang and others, TDR must meet three criteria:

- i. Focus on problems with social relevance;
- ii. Facilitate mutual learning process among researchers belonging to various disciplines (from academia and other research institutions) and from outside the academia; and
- iii. Strive to develop knowledge that is solution-oriented, socially robust, and adaptable to practice at both scientific and societal levels (Lang, et al., 2012).

TDR is capable of addressing complicated problems that are beyond the scope of traditional science. TDR addresses contentious problems with high stakes in a practical approach. It can not only expand existing scientific data but also generate new insights which promote benefits to the society by providing holistic solutions. It can have a wide range of societal consequences, both during and beyond a project's lifespan. (Organisation for Economic Co-operation and Development, 2020).

III. KEY PARAMETERS OF TDR PROJECTS

According to Organisation for Economic Co-operation and Development (2020), TDR projects have six key parameters.

- i. Breadth/diversity of interdisciplinarity – With interdisciplinarity present in all TDR initiatives and with a distance in knowledge between disciplines, there will be differences in the way each problem is addressed. The more distinct the disciplines are, the more difficult it will be to integrate them effectively. Factors involved such as different institutional/professional frameworks, working methods etc. can also add to the complexity and thus affect its effectiveness.
- ii. Depth of integration of disciplines – Interdisciplinarity, by definition, involves creating new knowledge and theory and the blending of working methods and heuristics. The degree of integration can range from shallow to deep and will depend on the degree of distance between the disciplines, the time frame, and the complexity of the problem. Greater complexity means that there are more interactions and feedback loops, which creates a bigger impact.
- iii. Degree/quality of interaction with non-academic participants – For TDR, there needs to be substantial participation beyond academia and the extent of influence of stakeholders can vary from project to project. The technical complexity of the project, available resources and time frame are among the decisive factors of TDR. Participation of non-academics needs to be more than symbolic and a mechanism without consultation with stakeholders for adopting suggestions fails to be a true TDR process.
- iv. Composition of non-academic partnerships – Non-academic partnerships from different stakeholders from the public, private, civic sectors and communities need to be promoted. They can add practical knowledge that is acquired at the field level and it can augment the depth of TDR.
- v. Timing of participatory engagement – Active and timely participation of all stakeholders in all phases can enhance the TDR project.
- vi. Types of knowledge – TDR is not restricted to a single subject of study; it is influenced by knowledge from all academic and non-academic fields. (Organisation for Economic Co-operation and Development, 2020).

IV. TRANSDISCIPLINARY TEAMS

Transdisciplinary (TD) teams are groups of researchers, scholars, practitioners, and community stakeholders who work together to solve problems at the crossroads of scientific disciplines. They generate knowledge by combining divergent sectors' tools, techniques, and/or theories that would not be attainable without collaboration (Somerville & Rapport, 2002). These are by nature knowledge-producing teams (KPT) that use a variety of resources to address social problems (Lotrecchiano & Misra, 2018).

Asteams participate in participatory techniques to generate new knowledge; collaborative learning is promoted through the development of shared conceptual frameworks and mental models (Lotrecchiano & Misra, 2018). Transdisciplinary teams can take a critical look at social problems and promote a collaborative effort to effectively formulate successful solutions for them.

Transdisciplinary teams may face challenges in their collaborations with varying views and opinions. Lotrecchiano and Misra classified these problems or challenges faced by TDKPTs as systemic complexities. Interactive systemic complexities and structural systemic complexities are forms of systemic complexity that form challenges to transdisciplinary research teams. Problems that originate from human interactions are included in interactive systemic complexity. Transdisciplinary research involving stakeholders from several fields carries a plethora of ideas and perspectives. A gap in the communication of these ideas and thoughts can result in discrepancies within the TD teams. Problems associated such as passive listening, differences in opinions etc. can affect the quality of the research and its impact of it. Structural systemic complexity refers to problems that occur as a result of team members' unique qualities. TD teams comprise members belonging to a wide range of disciplines with an equally wide range of understanding of the same problem. These may bring in challenges to providing solutions to a problem as the various team members may have various means of reaching a solution (Lotrecchiano & Misra, 2018).

As per a toolkit prepared by the Center for Development and Disability (CDD), New Mexico, for a transdisciplinary team approach, key elements which are possessed by TD teams include:

- i. Individuals from multiple disciplines
- ii. Holding regular team member meetings
- iii. Clear and common purpose
- iv. Members cross borders of disciplines
- v. A team member as a leader
- vi. Collaboration and sharing of information, skills, and resources
- vii. Shared responsibility (Center for Development and Disability, 2019)

By consulting with one another, members of a transdisciplinary team bridge professional discipline barriers to accomplish service integration. They don't abandon their discipline; instead, they combine specialised abilities with those of other team members to focus on and achieve a common goal (Center for Development and Disability, 2019).

Members of a transdisciplinary team can offer their knowledge and skills but need to work together to choose the best ideas or methods (Kokemuller, 2021).

V. PROCESS OF TRANSDISCIPLINARY RESEARCH

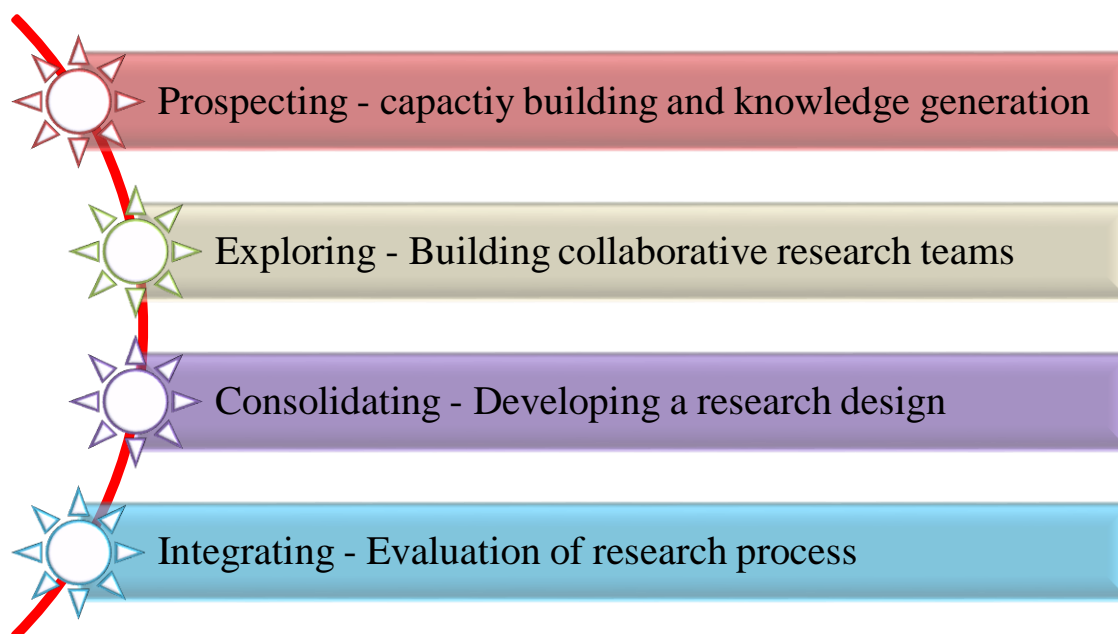
Lang et al. constituted an ideal-typical model to narrate the process of transdisciplinary research. Transdisciplinary studies are seen as a "interface practise" in this paradigm since they emerge from socially relevant concerns and are based on a collaborative learning process.

Transdisciplinary research combines two approaches to addressing real-world problems: problem-solving (which involves exploring novel solutions to problems) and scientific innovation (creating interdisciplinary techniques, methodologies and general insights linked to the area of the problem (Lang, et al., 2012).

The ideal-typical conceptual model in an RDR process consists of three phases – problem framing and team building; cocreation of solution-oriented transferable knowledge and reintegration and application of created knowledge (Lang, et al., 2012). Cockburn et al., contributes to this model by adding in a new step – “prospecting” (Cockburn, et al., 2016). Cockburn’s model looks into this as the initial phase of TDR. In this stage, a series of experiments are conducted to evaluate alternative ways to capacity building and knowledge generation, as well as to form mutually beneficial collaborations and establish trust (Cockburn, et al., 2016). So, the ideal-typical process of TDR can be shown as depicted in Chart 1.

Chart 1

Ideal-Typical TDR Process



Lang’s TDR process consists of three phases:

- i. Phase A: Framing of problem and creation of a research team
- ii. Phase B: Adoption of research methodologies for co-creation of solution-focussed and transferrable knowledge
- iii. Phase C: Application and implementation of research results (Lang, et al., 2012).

Each phase encompasses various activities involving the various stakeholders of the research. The problem looked onto in Phase A may be societal or scientific in nature. Each problem

will be dealt on focusing on its various entailing aspects and factors. Finally, by the end of the process, the problem and the solutions attained will be evaluated based on its scientific or societal impact.

VI. SOCIAL WORK AND TRANSDISCIPLINARITY

Transdisciplinary research integrates and transcends the natural, social and health sciences in a humanities context from their traditional boundaries (Soskolne, 2000). The initial transdisciplinary attempt from the disciplines of social sciences was from Public Administration and Anthropology (Singh, 2019).

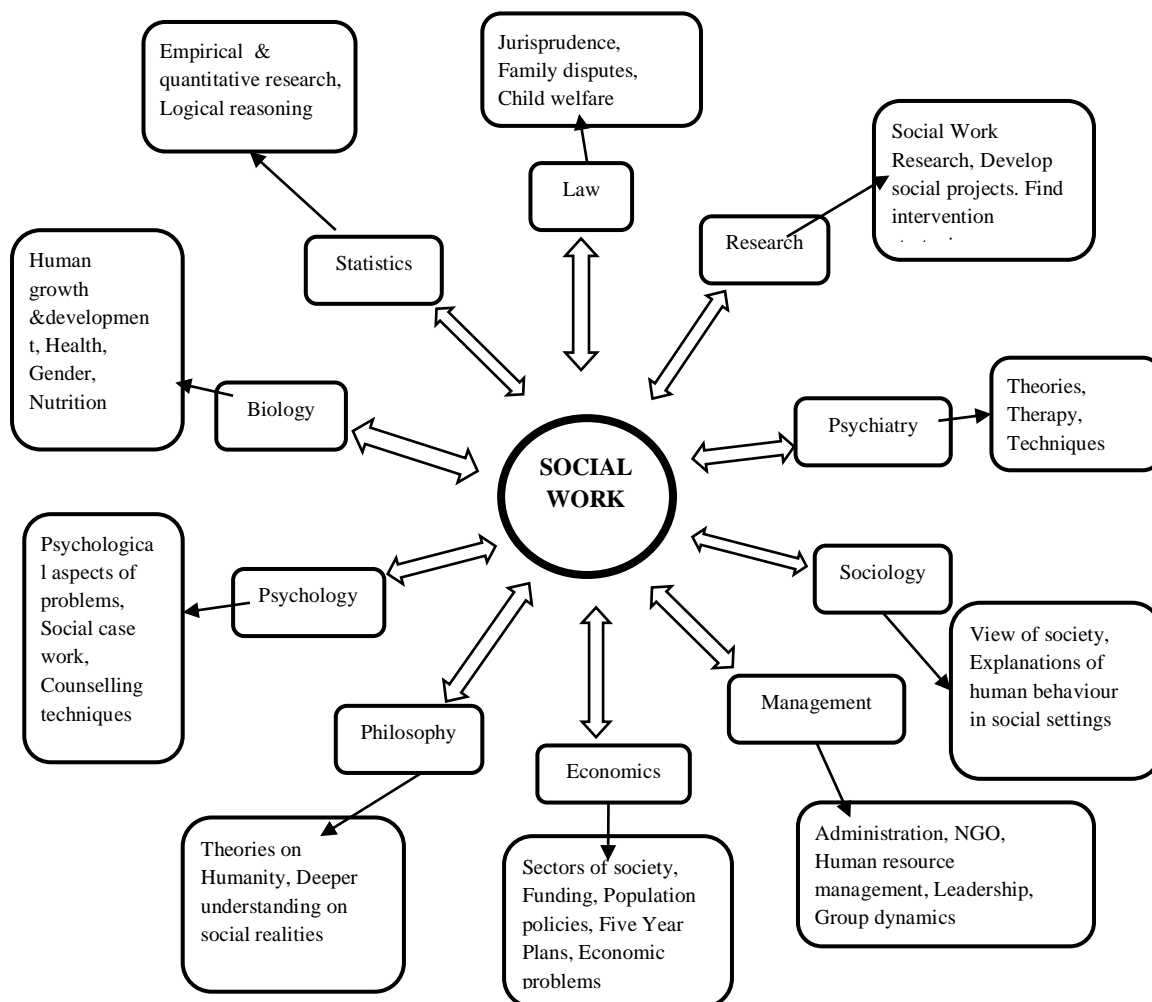
Social Work is closely associated with the concept of transdisciplinarity and transdisciplinary research. Social work is a discipline that imbibes knowledge from multiple disciplines such as Sociology, Psychology, Law, Psychiatry, Management, Economics, Biology and so on. Social work evolves through the adaption and integration of knowledge from these disciplines. Knowledge and skill sets received through this interconnectedness equip social workers with competence. A collaborative effort using various disciplines is used in solving societal problems.

Hyun (2011) states that the transdisciplinary project focuses on the various possibilities in the natural and social ecology of human living in a socially responsible manner to respond to and cope with emergent human and natural challenges and problems. TDR necessitates socially responsible human interaction. The transdisciplinary approach is typically used to handle comprehensive and multifaceted socio-ecological problems, such as those involving the interaction of humans, their society, and the natural systems in which they live. (Hyun, 2011). Social work encompasses all these interactions and addresses the multifaceted problems faced by society. It can be interpreted from Hyun, how closely associated transdisciplinarity is with social work and vice versa.

Figure 1 depicts a simplified representation of the transdisciplinarity involved in social work.

Figure 1

Transdisciplinarity in Social Work



Note. Figure 1 demonstrates the transdisciplinarity which is deeply rooted in social work. Social work as an art, a discipline, and a practice cannot function alone. It draws inspiration from all the disciplines and simultaneously it provides inferences to other disciplines also.

A survey of fifty top-ranked social work schools' assistant professors indicated that a substantial majority of the participants agreed that transdisciplinary research is essential, that more training is needed, and that they are relatively well equipped in relevant skill sets. The study also discovered that 23 per cent of the assistant professors had never heard the term "transdisciplinary research" before taking the survey but a large majority (98%) believed it was important to social work (Moore, Martinson, Nurius, & Kemp, 2018). The knowledge on transdisciplinarity and working on it can contribute to the existing social work pedagogy.

In an article by Carol Broersma, she concludes that infusing a transdisciplinary approach into traditional social work education can address professional bias and interdisciplinary awareness. She states that this can improve a student's ability to effectively function in collaboration across disciplines and also suggests further research into this subject (Broersma, 2014).

Taking into consideration the various settings of social work practice such as medical, institutional or even management, everything involves a transdisciplinary aspect. But the research that goes into the thought still needs to be developed. For instance, working with children is one of the important fields of social work. Many early intervention programmes

employ some type of transdisciplinary approach, which has been recognised as a best practice for early intervention (King, et al., 2009).

Lena Dominelli (2018) defines green social work as “a transdisciplinary, holistic approach to environmental crises that have challenged the social work profession to incorporate its principles, values and concern over environmental degradation, and the disasters associated with this into daily, routine, mainstream practice”(Dominelli, 2018). According to Hadorn et al. (2008), transdisciplinary research generally shows four characteristics:

- i. Focus on life-world problems
- ii. Transcending and integrating disciplinary paradigms
- iv. Research that is participatory in nature
- v. Search for unanimity of knowledge beyond disciplines (Hadorn, et al., 2008)

These characteristics are at the heart of green social work theory and practice (Sammonds, 2018).

Social workers working in medical settings work with a transdisciplinary team consisting of medical providers, physical therapists, psychiatrists and other professionals. Transdisciplinary care encompasses a team of experts working together to exchange knowledge and abilities across disciplines. Members of diverse disciplines in a transdisciplinary team are not only proficient in their own speciality but also become educated in other specialisations through cross-training and teamwork, causing team members' talents to overlap (Margaret Dawson Hobbs, 2005). The Indian Council of Medical Research (ICMR) seeks the services of social work discipline and social workers in the development of various community-related projects.

The interconnectedness of social work with other disciplines is what distinguishes it. Law is one of the settings in which social work can make a difference and vice versa. The legal system forms an essential aspect of a client's social environment. Social work is also involved in legal systems such as child welfare, criminal justice, women's rights, and so on (Barsky, 2011).

One of the core processes of community practice, as stated by Marie Weil (2005), is development that encompasses models of community, social, economic and sustainable development (Pradeep & Sathyamurthi, 2021). For effective community social work, it requires a holistic approach involving contributions from transdisciplinary teams, including academic as well as non-academic experts. The transdisciplinary approach can lead to novel perspectives and ideas which can enhance the quality of practice.

With the shifting roles of social workers, it has become necessary to be well-versed in theories and learnings beyond the discipline. Each role requires contributions from social work as well as from other subjects. This shows the need to develop a transdisciplinary-infused social work curriculum in educational institutions.

Corporate social responsibility (CSR) is a field where social workers are employed. CSR denotes a company's contribution to societal development (Gotea & Roşculeţ, 2019). Professionals from a variety of disciplines work in this sector, including specialists in

social, economic, demographic, and environmental dimensions; human resources; legal experts; community leaders, and other stakeholders. CSR can only be carried out effectively with a transdisciplinary team supporting the notion and working towards it.

There is a need for conducting transdisciplinary meetings to promote collaborations towards a new research idea and solve societal problems. Transdisciplinary research may be of help in developing social work methods and techniques and helping a wider population of society.

Disaster management is yet another field where social workers play a huge role. During the Kerala Floods of 2018, a transdisciplinary effort was able to assist those who were affected. Voluntary teams consisting of social workers, psychologists, healthcare professionals, law enforcement authorities, community members (particularly youth), members of religious organisations, non-governmental organisations and mainly fisherfolk were all involved in the rescue and rehabilitation of the flood-affected. The transdisciplinary approach and efforts made by these members aided in the rapid rehabilitation of the flood-affected. Transdisciplinary research is an inevitable part of disaster management. A study by Amita Singh and others (2018) show that accountability for the cause of floods in Kerala in 2018 could only be rectified by the integration of transdisciplinary information (Singh, Reddy, Kamthan, & Chugh, 2018). Disaster management tools have been developed through the collaboration of various disciplines and knowledge of ground reality. The UN General Assembly adopted the Hyogo Framework for Action (2005-2015) and its following Declaration on Building the Resilience of Nations and Communities to Disasters in its resolution. This shifted the focus of disaster research away from mere scientific research on physical earth phenomena and towards communities, governance and decision-making structures. This has led to the development of the Disaster Management Act in 2005 by India (Singh, 2019).

Various departments and research institutions are seeking collaborative efforts from multiple disciplines, including social work to produce initiatives and projects that will have a valuable impact on communities and societies. These projects also incorporate non-academic stakeholders who can provide enriching knowledge that is valuable in the field level of work and the overall impact of the project. There is a huge gap in transdisciplinary efforts involving social work research in India. This can be fulfilled by developing transdisciplinary teams across various departments and institutions.

VII. CONCLUSION

Transdisciplinary research encompasses not only the collaboration of disciplinary approaches but also extending approaches for producing fundamentally new conceptual frameworks, theories and models, hypotheses and methods. The goal of TDR is to boost innovation and scientific knowledge (Hall, et al., 2012). It is a new paradigm in the existing research methodologies. The TDR process entails the distribution of new information as well as the application of new knowledge in practice and research in general (Pohl, Klein, Hoffmann, Mitchell, & FAM, 2021). Although not a new technique of study, the transdisciplinary approach feeds on disciplinary (topic) research, which is therefore illuminated in a new and constructive way formed by the dialectic relationships between them (Todorova, 2013).

Because of the complexity of emerging societal challenges, transdisciplinary research is

becoming increasingly relevant. There is a need to foster transdisciplinarity in both education and research. Social work is a field with a broad scope that may contribute to work at the micro, meso, and macro levels. When transdisciplinary research is combined with social work, it can have a bigger impact and aid in the production of new ideas, thoughts, and information. Current social work research and education remain vital, but the key concern is its evolution to meet the needs of transdisciplinary work culture of today (Jebaseelan & Fonceca, 2021).

Institutions specialising in transdisciplinary research and studies should be promoted, and there should be more aware of the process of carrying out transdisciplinary projects and studies. It can extend one's perspective towards a problem. Qualitative transdisciplinary research may give a more in-depth understanding of problems and is an approach that can be used in socially relevant projects and studies. Transdisciplinary research can bridge the gap between academia and field level work.

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