Systems Transdisciplinarity Chair as Pathway to Fulfill Global 'Social Orders'

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Abstract

This paper shows how modern transdisciplinarity is developing into two main directions: 'transdisciplinarity for scientific research' as well as 'transdisciplinarity for education'. These orientations have individual goals and objectives. The transdisciplinarity for scientific research helps to complete the transformation of the potential for interdisciplinary interaction and the integration of disciplines. Whereas transdisciplinarity for education develops in a wide range – from the formation of tolerance and pluralism in the worldview of students to the training of master's students in a systems transdisciplinary discipline (metadiscipline) at a special university chair. The paper analyzes the reasons why the idea of a mobile transdisciplinary chair in 1997 was not widely adopted. In turn, a rationale is given that, for objective reasons, the idea of a classical transdisciplinary chair can be implemented in interested universities after 2026.

Keywords: *transdisciplinarity, higher education, transdisciplinary chair, sustainable development.*

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1. Introduction

The idea of a transdisciplinary chair was initially proposed by participants of the International Congress 'Which University for tomorrow? Towards a transdisciplinary evolution of the university' (Locarno, Switzerland, April 30 –

May 2, 1997)[1]. The subsequent discussion of this idea at the symposium 'For an international transdisciplinary chair' (March 21–22, 2024, CIRET) demonstrates the increasing responsibility of universities for the development of society. To ensure the success of the transdisciplinary chair, it is necessary to identify the reasons that have limited its effectiveness in 1997. To ensure the successful implementation of the idea of a transdisciplinary chair, it is necessary to identify the reasons that limited its effectiveness in 1997. It is also necessary to recall that in the international transdisciplinary community there was an idea of a classical transdisciplinary chair, which also received its development. In our case, the idea of a classical transdisciplinary chair at interested universities will be examined in detail. At such chairs it is planned to train master's students in a special metadiscipline – systems transdisciplinarity. By studying a new specialty, students will receive the necessary theoretical training and practical skills to solve high-threshold problems of modern society, which include problems of sustainable development.

2. Idea of a Mobile Transdisciplinary Chair in the Direction of 'Transdisciplinarity for Scientific Research'

The idea of the 1997 transdisciplinary chair emerged from the seminar 'Interdisciplinarity in Universities' (Paris, September 7–12, 1970), which raised two basic directions of transdisciplinarity[2], namely, 'transdisciplinarity in scientific research' and 'transdisciplinarity in education'.

Within the scope of 'transdisciplinarity for scientific research', as announced by Jean Piaget[3] and later actively developed by B. Nicolescu[4], it is assumed that transdisciplinarity should be the highest form of natural integration of disciplinary discourses, scientific and artistic cultures. The goals of this direction are achieved through the following activities:

- forming actively subdisciplines that provide integration and syntheses of knowledge of complementary disciplines within a platform of basic discipline (such as economics, ecology, etc.). For example, the ATLAS is working towards

[1] Declaration and recommendations (1997). *Which university for tomorrow?* Locarno, Switzerland (April 30 – May 2, 1997). https://ciret-transdisciplinarity.org/congres_de_locarno.php#en, consulted on 1.05. 2024.

[2] Apostel, L. (1972). *Terminology and concepts. Interdisciplinarity: Problems of Teaching and Research in Universities*. Paris. OECD Publ, 79–81. Retrieved from https://archive.org/details/ERIC_ED061895/page/n77.

[3] Piaget, J. (1972). *The epistemology of interdisciplinary relationships. Interdisciplinarity: Problems of teaching and research in universities*. Paris. OECD Publ. Retrieved from https:// archive.org/details/ERIC_ED061895/page/n135.

[4] Nicolescu, B. (2006). *Transdisciplinarity – Past, present and future*. In B. Haverkort & C. Reijntjes (Eds.), *Moving Worldviews – Reshaping sciences, policies and practices for endogenous sustainable development*. Holland: COMPAS Editions, pp. 142-166. Retrieved from http://basarab-nicolescu.fr/Docs_articles/Worldviews2006.htm#_ftn1.

creating a subdiscipline that provides integration and syntheses of knowledge of complementary disciplines within the platform of engineering discipline[5];

- conducting transdisciplinary research. For example, creating transdisciplinary knowledge producing teams (TDKPTs) based on team science[6];

- implementing transdisciplinary innovations (special curricula) to develop general cultural competencies in students during their education at the universities. At Clermont Graduate University (CGU), for example, graduate students must complete a T-Course (transdisciplinary course) during the first two years of their curricula[7].

Such activities are expected to enhance students' cultural awareness, tolerance, and openness to knowledge from other disciplines. Consequently, in the context of the 'transdisciplinarity for scientific research', universities do not require special institutional forms such as a transdisciplinary chair. This conclusion aligns with the organizational thesis presented in the 'Document synthesis' of the International Congress 'Which university for tomorrow? Towards a transdisciplinary evolution of the University', Locarno, Switzerland, 30 April – 2 May 1997[8].

Since transdisciplinarity is not a new discipline, the creation of new 'transdisciplinary' chairs is out of the question. On the other hand, it is highly desirable to organize transdisciplinary research seminars in a few pilot universities, which would become real centers of excellence.

It should be noted also that the direction of 'transdisciplinarity for scientific research' has an *evolutionary character*. Therefore, it does not require *unambiguous results* of transdisciplinarity development to be achieved by a *certain date*. This circumstance allows us to assert that various elements of the 'transdisciplinarity in scientific research' as a direction are successfully implemented and will continue to be improved within the framework of modern universities. However, in this case, it is appropriate to ask the question whether it is reasonable to expect an economist, ecologist, or sociologist, who possesses general cultural competencies, a high level of tolerance, and openness to knowledge from other disciplines, to solve sustainable development problems within a specific timeframe. It is unlikely that they would be able to do so.

Here is a simple example. It is logical that when we need to cure a sore tooth, we seek the assistance of a dental professional. We expect that this dentist has specialized dental training and access to advanced dental technology. We are strongly opposed to having our teeth treated by a highly cultured and tolerant

[5] https://theatlas.org/index.php/transdiscipline, consulted on 1.05.2024.
[6] Lotrecchiano, G., Mallinson, T., Leblanc-Beaudoin, T., Schwartz, L., Lazar, D., & Falk-Krzesinski, H. (2016). *Motivation and threat indicators for collaboration readiness in knowledge generating teams (KPTs): A scoping review and domain analysis*. Heliyon, 2(5).
[7] https://my.cgu.edu/transdisciplinary/, consulted on 1.05.2024.
[8] Gobeil, M., & Nicolescu, B. (1997). *Le projet CIRET-UNESCO Évolution transdisciplinaire de l'université.* Retrieved from http://ciret-transdisciplinarity.org/projet_ciret_unesco.php#fr.

environmentalist or economist instead of a dentist. However, when seeking solutions to the challenges of sustainable development, we often turn to professional economists and ecologists rather than specialists in solving wicked problems. This may be due to the fact that modern universities do not provide training for such specialists.

3. Idea of a Transdisciplinary Chair in the Direction of 'Transdisciplinarity for Education'

The second direction of transdisciplinarity development, which was announced by Erich Jantsch and later actively developed by M. Sommerville (Australia, Canada)[9] and Mokiy (Russia)[10], it is called 'transdisciplinarity for education'. This direction is intended to address the problem of training such specialists (systems transdisciplinary generalists). It is supposed that within this framework 'Transdisciplinarity should provide the coordination of all disciplines and interdisciplines based on a generalized axiomatics and an emerging epistemological model'[11]. This fact indicates that the bearer of 'generalized axiomatics and emerging epistemological model' should be a special metadiscipline (systems transdisciplinarity). This metadiscipline will have all the attributes of a classical discipline that condition scientific rigor, which involves the following requirements:

- philosophical foundation (basic axioms of Unicentrism);
- theoretical concept (the image of the General order, which determines the unity of the world);
- methodology (transdisciplinary method and research procedures);
- transdisciplinary language (description of logical-geometric models of spatial, temporal, and informational units of the general order, as well as descriptions of logical-semantic models of research objects), etc.

The emergence of metadiscipline creates a need for a new institutional form, which is a systems transdisciplinary chair. It is important to note that this

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[9] Sommerville, M. (1991). *Transdisciplinarity – The Wave of the Future: Building the Foreshore*, Keynote Address, *UNESCO*, International Symposium on Interdisciplinarity, Paris, France. April 1991; Sommerville, M. (1998). *Transdisciplinarity, building a theoretical framework*, UNESCO, Division of Philosophy and Ethics, Symposium 25 to 29 May 1998. Retrieved from http://unesdoc.unesco.org/images/0011/001146/114694eo.pdf.

[10] Mokiy, V. S. (2019). „International standard of transdisciplinary education and transdisciplinary competence". *Informing Science: The International Journal of an Emerging Transdiscipline*, 22, 73–90. DOI: https://doi.org/10.28945/4480; Mokiy, V. S. (2020). *Systems transdisciplinarity as a metadiscipline.* i2Insights. https://i2insights.org/2020/10/27/systems-transdisciplinarity-metadiscipline/#more-16766.

[11] Jantsch, E. (1972). *Towards interdisciplinarity and transdisciplinarity in education and innovation. Interdisciplinarity: Problems of teaching and research in universities*. Paris. OECD Publ, 99, 105–106. https://archive.org/details/ERIC_ED061895/page/n101.

circumstance gives the direction of 'transdisciplinarity for education' a *revolutionary character*. Wicked problems (problems of Sustainable Development) are existential (essential to life) problems of modern society. Therefore, such problems must be solved *with certain results by a certain date*.

However, this does not mean that all universities in all countries should start training systems generalists at systems transdisciplinarity chairs. The main task of universities remains unchanged – to provide the life and activity processes of society with disciplinary specialists capable of solving people's everyday problems. But the global 'social order' to solve the problems of Sustainable Development can be fulfilled if the training of systems transdisciplinary generalists will be realized at the systems transdisciplinarity chairs only in the leading universities of different countries.

The limited number of generalists is conditioned by the peculiarity of their practical activity. Such specialists will:

- successfully play the role of transdisciplinary facilitators in teams carrying out transdisciplinary research;
- reinterpret sustainable development issues and propose ways to effectively address them based on acquired knowledge and competencies;
- and finally, they will be successful negotiators in international expert teams of similar generalists from other countries; this will allow international expert teams to offer effective solutions to sustainable development problems based on a common (international) level of professional training, but at the same time taking into account national interests.

The creation of systems transdisciplinarity chairs as a response to the need to train a limited number of students at the master's or postgraduate level in a framework of scientific discipline traditional for the university will allow removing the stigma of 'marginal direction' from transdisciplinarity.

4. Stages of recognition of transdisciplinarity as a metadiscipline

Endowing transdisciplinarity with the traditional attributes of scientific discipline – philosophical substantiation, concept, methodology, technological solutions, it is possible to organically integrate it into the existing classification of scientific directions and scientific approaches. In turn, the creation of textbooks, manuals, training programs, as well as the organization of special training and retraining of teachers will allow us to organically integrate this transdisciplinary metadiscipline into the educational process of universities. Thus, this will make it possible to change the attitude towards the transdisciplinarity of academic researchers and practitioners as a marginal experience not integrated into the structure of universities. Furthermore, it will also help to complete the evolutionary stage of higher education.

By combining the events described in this paper with the systems transdisciplinary model of the temporary unit of order, it was possible to determine

the important development parameters of the transdisciplinary metadiscipline (see **Figure 1**).

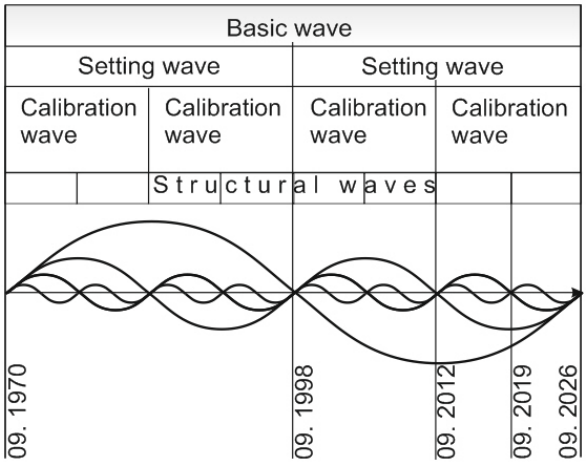

Figure 1. *Systems transdisciplinary model for the development of Idea of a transdisciplinary chair in the direction of 'transdisciplinarity for education'.*

For a proper understanding of the model, it is necessary to give short explanations. A Basic wave is a depiction of complete duration of development of objects or functional ensemble of objects. A Setting wave is a depiction of duration of inevitable stages of development of object or functional ensemble of objects. A Calibration wave is a depiction of periods, which differentiates logical combination of basic stages (moments) of development of the object or functional ensemble of objects. A Structural wave is a depiction of periods, which differentiates logical combination of current events of development of the object or functional ensemble of objects. Basic wave and Setting waves are carriers of a hard development program. Calibration waves and Structural waves are carriers of a soft development program[12]. Within the framework of a soft development program, current events that are associated with the real-life are formed and take place. Within the framework of a rigid development program, significant events are formed and occur that synchronize the goals and results of the events of the soft programs. Seminar on Interdisciplinarity in Universities, Paris, September 7^{th} – 12^{th}, 1970 is an event that lays down the potency, goals, and meanings of all four types of waves – the hard and soft programs of development of transdisciplinarity in education (metadiscipline), the meaning of which was laid down by

[12] Vladimir S. Mokiy, Tatiana A. Lukyanova. (2019) „Imperatives of Sustainable Development from the Perspective of Systems Transdisciplinary Approach", *Transdisciplinary Journal of Engineering & Science*, vol. 10. https://doi.org/10.22545/2019/0127; Mokiy, V. S. (2021). „Information on the time. Systems transdisciplinary aspect". *Universum: Social Sciences*, 1–2 (71). https://doi.org/10.32743/UniSoc.2021.71.1-2.30-39.

G. Michaud and E. Jantsch.

The symposium 'Transdisciplinarity: Stimulating synergies, integrating knowledge' took place in Royaumont Abbey (France) in May 1998 – it was no ordinary event. This event characterized the end of the first rigid development program (Setting wave). Therefore, it was proclaimed at this symposium that transdisciplinarity is conceived as 'meta-methodology'. This definition of transdisciplinarity has given meaning to the second Setting wave (hard program). In addition, it occurred in October 1998, when the World conference was held in France – Higher Education in the Twenty-First Century: Vision and Action. At the conference, the need to use transdisciplinarity in the training of university students was officially announced.

September 2012 is the critical point for the second wave of the hard program. Thus, it was in September 2012 that the initiative and editorial groups in the United States entered the final phase of the work in preparation for the publication of the report 'ARISE 2' (Advancing Research in Science and Engineering). This report already provides practical recommendations for adapting transdisciplinarity to the structure of higher education as a new discipline. The last Supporting wave was launched in September 2019. The peculiarity of this wave is that it completes the action of all long-term rigid and soft programs of transdisciplinarity development as metadiscipline. Therefore, the meaning, content, and results of real-life events in this seven-year wave, related to the development of transdisciplinarity, as meta-disciplines are predetermined. In this context, the appearance of this article is a predetermined event of a hard program (Basic wave). According to this model it can be assumed that the urgency to solve the multifactorial problems of modern society will contribute to the fact that transdisciplinarity by September 2026 will be adopted in the structure of higher education as a metadiscipline.

5. Conclusion

In conclusion, it can be argued that both main directions of transdisciplinarity development serve important but distinct roles in modern universities.

The direction of *'transdisciplinarity for scientific research'* does not require the creation of transdisciplinary chairs to fulfill its activities. This direction has already been successfully implemented in the structure of higher education in various forms of transdisciplinarity institutionalization. These forms are able to self-develop and accumulate experience of transdisciplinary research and transdisciplinary innovations during the academic activity of universities.

The direction of *'transdisciplinarity for education'* requires the creation of a systems transdisciplinarity chair as a form of institutionalization, traditional for the disciplinary structure of universities.

Establishing this form requires a significant amount of organizational work ranging:

- from convincing higher education organizers, university rectors, and funding organizations of the urgent necessity of establishing a specialized chair into the disciplinary structure of universities, to the creation of a full-scale textbook on systems transdisciplinarity;

- from forming an international standard of higher education in the specialty of 'systems transdisciplinary generalist' to the training of teachers in the new metadiscipline;

- from creating positive attitudes towards the new metadiscipline among university faculty members to sensitizing disciplinary specialists, policy, and government officials to its practical capabilities.

Starting from 2023, this organizational work is being carried out through two international transdisciplinary projects in higher education and sustainable development (2023–2030). These projects are carried out by the Institute of Transdisciplinary Technologies (ITT) in collaboration with International Center for Transdisciplinary Research (CIRET), as well as by teachers, academics, and researchers from different countries, who have provided the necessary informational and other support[13]:

- forming a systems transdisciplinary worldview in higher education (2023–2026)[14].

- developing philosophical and conceptual methodologies for planning, predicting, and managing sustainable development of liberal stage society (2023–2030)[15].

Successful implementation of these projects will enable interested universities in different countries to start training systems transdisciplinary generalists as early as in 2026. Further, by 2030, these specialists will be able to utilize the methods and technologies necessary to effectively address sustainable development challenges.

Acknowledgment and conflicts of interest

The author declare that he has no conflicts of interest with respect to the research, authorship, and/or publication of this article.

Any errors or omissions are his own.

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[14] http://www.td-science.ru/images/kart/passport_of_the_education_project_2026.pdf, consulted on 1.05.2024.

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