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Why is trans-disciplinarity so difficult?

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ABSTRACT

If trans-disciplinarity goes beyond the boundaries of various scientific fields (i.e. of interdisciplinarity) by various stakeholders, such as practitioners, citizens, policymakers, and businesses, in the knowledge production process, *why does it seem so difficult in practice*?

Why do very good theoretical models of trans-disciplinarity fail both in creating integrative solutions that are sound and relevant to real-world problems and in fostering societal innovation and learning?

This presentation will try to answer this sequence of questions by examining which **inherent problems** in academia and various societies operate as stumbling blocks:

On the one hand, in ***academia***, there is the *bias* that expressing difficult issues in an understandable language is something that is neither scientific nor profitable; it is rather time-consuming and very insecure in social practice. There is also the *academic attitude* that "what is said is the 'absolute' truth of the matter" [a snobbish attitude/hubris]; a variety of examples will be provided.

On the other hand, the ***wider society*** is very hesitant when encountering a "pure" academic discourse (which is not understandable) and sense that they are looked down upon by the academics.

Finally, the presenter will discuss the intangible aspects of trans-disciplinarity, and how these aspects, when practiced, can remove stumbling blocks of miscommunication, a fact that takes time and effort from both sides.

1. DEFINITION

Although there are extensive bibliographical references, the author of this study prefers to refer to two as mentioned in the following paragraphs.

Back to 1998 UNESCO claimed: "transdisciplinarity - working against the fragmentation of knowledge carried out in the name of the disciplines - represents a positive answer to those excesses of hyperspecialization, which have the tendency to become just sterile compartmentalization, and where intellectual obstacles reinforce institutional obstacles and vice versa" [1].

Moreover, trans-disciplinarity is claimed to be an approach that integrates knowledge systems, skills, methods, values, perspectives and fields of expertise within inclusive and innovative collaborations that bridge academia and the wider society, to develop transformative outcomes that respond to complex social and societal problems and challenges [2.]

2. POSITIVE AND TANGIBLE ASPECTS OF TRANS-DISCIPLINARITY

In this section, the writer of present article will discuss how two famous scientists popularized their discipline(s) and science locally, nationally and internationally.

Carl Sagan

Carl Sagan (1934-1996) was an American astronomer, planetary scientist, cosmologist, astrophysicist, astrobiologist, and author who is regarded as one of the most influential scientists of the 20th century, since he is best known for his ability to communicate complex scientific concepts to the general public in an engaging and accessible manner.

Sagan's most significant contribution was to popularize science to American and international public, when his landmark television series, *Cosmos: A Personal Voyage* (a 13-part series) was first aired in 1980. In those series, Sagan explored a wide range of scientific subjects, from the origin of life to the nature of the universe with an engaging narration, which was coupled with state-of-the-art visual effects, and, as result, Sagan and those series made complex scientific concepts accessible to an international audience. *Cosmos* reached hundreds of millions of viewers in over 60 countries (either in English, dubbed or with subtitles), won two Emmys and a Peabody Award, and inspired a generation of scientists and science communicators, demonstrating that science could be both rigorous and entertaining [3].

Uri Margolin
Uri Margonin (1942 -) is Professor Emeritus of Comparative Literature at the University of Alberta, Canada, and, he is the one who popularized Narratology (a sub-discipline of Humanities) to university students and wider scientific and societal community [4].

3. NEGATIVE VIEWS ON TRANSDISCIPLINARITY

In this section, the author of this paper will present negative views on trans-disciplinarity which usually underlie human perceptions and behaviors and, thus, prevent the "real" co-operation between the academic world and societal actors.

Trans-disciplinarity as *simplistic* – Various Academic and Social and Political Biases

In academia – from a young scientist/academic point of view: When a scientist speaks or delivers a lecture in simple terms and makes difficult terms understandable, s/he is considered ***simplistic*** (***not simple!***) as if s/he is not able to use highly specialized scientific discourse. This becomes evident when a scientist submits a paper in a scientific journal and s/he becomes understood by a wider readership. Most of the editors and the readers of the paper consider it ***simplistic*** and, thus, ***not publishable***! As it is understood, this kind of mentality of the wider scientific society disheartens a young scientist/academic who tries to establish himself/herself in academia, get an academic (prestigious) position through publications, and, suddenly, s/he sees his/her transdisciplinary research being rejected. Furthermore, without a quite good number of publications, a young scientist/academic cannot get any funding for his/her research, and s/he is afraid of being academically isolated.

Moreover, there are some (hidden) sides of translatability that have not been tackled upon by theoreticians and practitioners of translatability. A scientist/academic who wants to practice translatability, s/he should: (1) have very good knowledge of his/her own field; (2) love his/her own field and wants to make it known to a wider public; and (3) have developed very good linguistic skills – that is, how to use and explain difficult at times terminology, avoiding heavy jargon [5].

In academia – from university students' point of view: University students, when encountering a scientist/academic (i.e. their teacher) who communicates difficult scientific terms in a very comprehensible way, consider him/her ***simplistic*** (***not simple!***), and think that s/he does not know his/her field. In this sense, the scientist's prestige is lost, and s/he is thought of as ***mediocrity!*** In this case, the scientist loses his/her students' respect.

In society – from stakeholders' or social actors' point of view: Sometimes, people of a local society, when encountering a scientist/academic who tries to communicate with them about a problem in "simple words", think of him/her ***simplistic*** (***not simple!***), and that s/he does not know his/her field. Having been exposed to scientists/academics who have repeatedly used ***jargon*** either to claim their academic prestige or to intimidate them (a case of ***hubris***), stakeholders or societal actors[1] or businesspeople are usually hesitant to participate in a trans-disciplinary project [5].

In politics – from politicians' point of view: Politicians (as project evaluation members), when encountering a scientist/academic who communicates difficult scientific terms in a very comprehensible way, consider him/her ***simplistic*** (***not simple!***), and think that s/he does not know his/her field. In this sense, the scientist's prestige is lost, s/he is thought of as ***mediocrity!***, and, finally, s/he does not get the funding that s/he expects.

[1] Within the present context stakeholders and societal actors are used interchangeably.

4. INTANGIBLE ASPECTS OF TRANS-DISCIPLINARITY

The author of this study will refer to some intangible aspects that underlie trans-disciplinarity, which are not referred to any international publications, to the best of her knowledge.

From an educational and a societal perspective, trans-disciplinarity requires the following five aspects that unmeasurable and intangible, and some of them become evident only in time.

Effort and Linguistic skills
A scientist/academic who wants to co-operate with stakeholders or societal actors in a trans-disciplinary project should make a mental and a linguistic effort to communicate how his/her scientific knowledge should be practiced in a specific trans-disciplinary project. He or she should not look down upon stakeholders as if they know nothing about the issue/problem at hand.

Time
(a) For ***a scientist/academic*** to communicate his/her scientific knowledge to people who are not specialists can be **time consuming**, because s/he should study what and how to communicate it to non-specialists. Of course, the time a scientist/academic spends to find a way to communicate in simple terms and words his/her knowledge is directly related to the aforementioned "effort and linguistic skills", because it takes time, effort and very good linguistic skills for a scientist/academic to communicate complex (scientific) issues that they may be involved in solving an environmental and/or social problem.
(b) Time is required by stakeholders or societal actors to understand and absorbed the trans-disciplinary information they get from a scientist/academic, no matter how simply this information is communicated, unless the information is visualized as in Sagan's *Cosmos*; see Section 3 above.

Experience in / Exposure to different (social) situations
This concerns primarily scientists/academics who, if they are connected with the local or greater community, cannot understand which problems the locals face and should solve.

Very good listening skills … and understanding
Both scientists/academics and stakeholders, when co-operating in a trans-disciplinary project, should have very good listening skills (i.e. they should listen carefully their interlocutors) and then try to understand what they are said or advised. In order for a trans-disciplinary project to be successful, all the participants are required to have the human trait as described below.

Humility
(a) A ***scientist/academic*** should not think that s/he knows everything and that s/he is ready to listen to and understand what stakeholders or societal actors tell him/her. If s/he does not understand something, s/he should ask a question; s/he should not pretend to know everything.
(b) ***Stakeholders or societal actors*** should not be intimidated by the expertise of a scientist/academic, and, if they do not understand something; they should ask a question so to understand what a scientist/academic means.

5. CONCLUSIONS

Going beyond the boundaries of various scientific fields and relating to various stakeholders and societal actors, trans-disciplinarity seems difficult in practice because there are inherent problems or biases in academia and various societies operate as stumbling blocks, as discussed in Section 3 “Negative Views on Trans-disciplinarity”. Nevertheless, as the author of the present study claims in Section 4, the “Intangible aspects of Trans-disciplinarity”, when practiced appropriately from both sides (i.e. scientists/academics and stakeholders/societal actors) can remove stumbling blocks of miscommunication, a fact that takes time and effort from both sides.

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