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Transdisciplinary niches fostering Lifelong Learning

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Abstract

"The theory of transdisciplinarity is fully developed. Now the time for action has arrived."
Basarab Nicolescu

The purpose of this paper is to outline a new approach of lifelong learning in the light of transdisciplinarity niches. Considering the issues education is currently confronting, a way to find solutions to these problems could be transdisciplinary research, consisting in transdisciplinary niches. The paper continues some previous research made in "Lucian Blaga" University of Sibiu in order to adapt engineering education to lifelong learning. It also provides two examples of transdiciplinary niches presented in two doctoral theses, which are now developed by "EU 2020 research cluster" in the aforesaid university. Both theses require a transdisciplinary approach and involve fields from engineering to education psychology, dealing with problems concerning education and lifelong learning. Transdisciplinary niches create an enriched research environment and can solve a part of the problems of today's education. Even if transdisciplinary research is more complex and time consuming, it is more suitable because it provides real solutions. It fosters lifelong learning through emphasis on teamwork; it creates new stimulating ideas, develops concepts and tools in order to solve real world issues.

Keywords: *transdisciplinary niches, lifelong learning, transdisciplinary research*, *education*.

1. Introduction

One of the four strategic objectives for the ET 2020 framework is making lifelong learning and mobility a reality. "The concept of lifelong learning is essential to the competitiveness of the knowledge economy."[1]. Lifelong learning aims to provide citizens with tools for personal development, social integration and participation in the knowledge economy**.** The concept must be applied to all levels of education and training and concerns all stages of life. In UNESCO - Medium-term strategy 2008–2013 it is mentioned that "….there is an immediate need to make lifelong learning an integral part of the whole educational system, indeed of the entire social and economic fabric."[2]

There are some major issues in putting life long learning into practice. One of them is the educational system of each country, which is not yet prepared to develop lifelong learning competences. How can educational systems deal with this, because "life-long competence development has become a major challenge to our educational systems that have not changed their educational policies and pedagogical models to support life-long learning."? [3] Another issue is the 'temporal contradiction' meaning "how to organize institutional teaching, clearly limited in both

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time (corresponding to the Bologna degree framework) and objectives (corresponding to the focused curricula) to meet the expectation of a dynamic and indistinct environment, as implied by the concept of lifelong learning."[4] So it is obvious that a change in education is required.

2. Why transdisciplinary niches?

Education and research are means for building a type of society. In view of changes in education in Romania, in January 2007 a Presidential Commission for the Analysis and Development of educational and research policies was founded, a commission of experts which presented in a report issued on 12 July 2007 and entitled "România educaţiei, România cercetării" a diagnosis of the system, as well as some solutions to the identified problems. Based on the report, a National Pact for Education was developed in March 2008 and signed by all education stakeholders.

A strategy was developed which aims at the development of education and research in the period 2009-2015. But when we talk about education and research development we must take into account that Education is clearly connected to the contemporary world issues, and the problems the contemporary world faces are not easy to solve. Part of the solutions to the problems education faces in the context of "open, heterogeneous, dynamic and uncertain environments (OHDUE)" [5] could be provided by transdisciplinary research.

The term "transdisciplinarity" dates back to 1970, from a conference that the OECD had in France, the first international conference on the problems of teaching and research in universities. Transdisciplinarity "was defined as a kind of comprehensive framework that tries to go beyond combining existing disciplinary approaches in an interdisciplinary fashion to create new frameworks, new overarching syntheses." [6]

As Nicolescu points out, "As the prefix 'trans' indicates, transdisciplinarity concerns that which is at once between the disciplines, across the different disciplines, and beyond all discipline. Its goal is the understanding of the present world, of which one of the imperatives is the unity of knowledge". [7] It is clear that we must search for "educational processes that will strive for the capability of adapting, and even thriving in areas of new problems and new opportunities" requiring schools to "look across disciplines, across the knowledge base of the sciences, across the wisdom of the humanities, the verities and explorations of the arts, for the ingredients that will enable our students to continually interact with a world in change, with the imminence of changes bringing essentially unforeseeable consequences."[8]

A definition of transdisciplinary research is given by Ertas "The Transdisciplinary Research Process can be defined as collaboration among scholars from diverse disciplines to develop and use integrated conceptual frameworks, tools, techniques and methodologies to solve common unstructured research problems. Transdisciplinary research leads to a creation of new paradigms and provides pathways to new frontiers." [9]

Wiesmann et al. wrote about transdisciplinary research that it "has arisen from a growing number of complex problems in the life-world for which knowledgebase solutions are sought but for which knowledge of a single scientific discipline or societal field is insufficient." [10]. It also "grasps the complexity of problems" and "takes into account the diversity of life-world and scientific perceptions of problems" [11], aspects that are very important in education and lifelong learning.

The concept of „transdisciplinary niches" was introduced by Bărbat in 2007 in connection with academic research, which is "confined to find "Prigogine niches"; they can be found mainly through innovative, emerging technologies […]. That means transdisciplinary niches." [12]

In his ensuing articles he developed on the topic of engineering education: "researchers are encouraged to investigate transdisciplinary niches, holistic approaches, and right-brain tactics."[13], "besides being promising and affordable the third reason for "Prigogine niches" is the synergy reachable thought transdisciplinary". [14]

It is obvious that this type of research is the proper one to be used in solving the problems which education from all over the world is confronting. It is also obvious that we need a new direction in educational policy and practice.

Universities all over the world are working to change their vision about research and education. Such a change in this research area started two years ago, in Lucian Blaga University from Sibiu, in a research cluster, made up of three PhD theses on CSITAO (Computer Science and Information Technology – focused on Agent-Orientation). As concerns the Transdisciplinary perspective, it can be said that "Although being found frequently in exploratory

research it is not mandatory as such. However, for CSITAO anthropocentrism (as target) and transdisciplinarity (as means to achieve it) are sine qua non requirements entailed by the very nature of services. The prefix "trans" insinuates – if not an opposition to "cross", "multi" etc. – which modern complex service providers have to cooperate seamlessly." [15]

Do transdisciplinary niches offer solutions for lifelong learning? The answer is yes, and I will give two such examples, two PhD theses begun one year ago.

The first thesis is: Nondeterministic e-Teaching for Sustainable Development in Rapidly Changing Environments.

"As target:

1. Identifying the most relevant coordinates of permanent education processes to ensure Sustainable Development

2. Propose a new approach to permanent education involved by the temporal gap separating the Teaching and Learning process: conventional e-Learning ◊ nondeterministic e-Teaching

3. Outlining an e-Teaching strategy focused on replacing a classic knowledge (rigid and ineffective) with a coherent set of educational (meta) procedures

These educational procedures must be able to catalyze the process of Learning in an uncertain and distant future (i.e., highly dynamic environments, open and uncertain spaces – OHDUE)

4. Experimental model to illustrate the above objective: Making a model of agent instructor [Teacher Agent] based on nondeterministic software, bounded rationality [BR] and generic architecture." [16]

The thesis focused on a new approach of "e-teaching" as imposed by the temporal hiatus between teaching and learning which is unavoidable in lifelong learning and points out that any metamodel of teaching should be based on psychosomatic features [BR]. It is a problem that concerns education nowadays and transdisciplinarity is required to offer the solution.

The second PhD thesis is: Holistic Heutagogy for E-maieutics based – Lifelong Learning

„Its main objectives are:

1. Innovating the concept of Heutagogy in view of adapting it to the temporal hiatus, which is inherent to Lifelong Learning.

2. Outlining a new approach to LLL that substantiates the assertion that heutagogy involves holism as perspective, premise and roadmap.

3. Sketching a strategy according to the objectives above, based on three trends:

a) from teacher to trainer / coach to catalyst;

b) from outdated knowledge to skills /competences to (meta) skills;

c) from pedagogy to andragogy to heutagogy.

4. Developing an experimental agent model which should catalyze in the future learner, in a Rapidly Changing Environment, (meta) learning processes via the e-learner agent

5. As agent orientation trends prove and E2020 strategy requires, the strong agency characteristics should focus upon nondeterministic right brain behavior aspects." [17]

The strategy that the second thesis proposes is necessary now, because in the context of lifelong learning the teacher must become a catalyst, the knowledge must be turned into metaskills. As concerns heutagogy, it "is appropriate to the needs of learners in the twenty-first century, particularly in the development of individual capability, individualized learning and independent learning."[18]

Both research themes deal with problems concerning education and lifelong learning, both require a transdisciplinary approach and involve fields from engineering to education psychology. They are examples of transdisciplinary niches that can foster lifelong learning.

3. Conclusions

The connection between education, lifelong learning and academic research is real and desirable. In our days we must find solutions not only for education but for "Just in time" education. Transdisciplinary niches create an enriched research environment and can solve a part of the problems of today's education. Even if transdisciplinary research is more complex and time consuming, it is more suitable because it provides real solutions. It fosters

lifelong learning through emphasis on teamwork; it creates new stimulating ideas, develops concepts and tools in order to solve real world issues.

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