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AN INTER-, TRANS-, CROSS- AND MULTIDISCIPLINARY APPROACH TO HIGHER EDUCATION IN THE FIELD OF BUSINESS STUDIES

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Abstract

Modern academic education in economics, and especially that in the field of business, frequently tries, and rather seldom manages to combine, interfere and unify, to varying degrees, distinct disciplines with practical interests usually similar or even seemingly adverse; its concrete action is an example of the successful attempt at prompt adaptation to the entrepreneurial reality, which is constantly changing, and also to the more and more dynamic economic environment, perhaps excessively so in the last two decades. This paper attempts to clarify the conceptual differences and the relatively common parts of inter-, trans-, cross- and multidisciplinary in general, and in particular in education, focusing on business education. A brief introduction structures the inter-, trans-, cross- and multidisciplinary investigative approach within an educational context in business, and a review of the scientific literature section clarifies both the meaning of those major concepts, extending from simple paradigm of each concept to their multiple aggregative paradigm, and some modern educational trends in economics. A second section is devoted to the method of investigating opinions, based on the volume of a sample determined statistically and from a scientific methodology of observation and recording, by collecting individual data, validating the rigor of research on the diversity in business education approaches, by simply and consistently noting them by the students and graduates of faculties of economics. The study of the graduates' opinions focused on an original questionnaire, presented in the annexes of the paper, and the resulting databases were subjected to a descriptive statistical analysis, made with the software package Eviews, with emphasis on the homogeneity, symmetry, skewness and normality of distributions. The third section is a brief analysis of the research results, supplemented naturally by some clarifying discussions, which outline the current option of the graduates towards *early multidisciplinary* as a necessary goal resulting from the content analysis of opinions.

The conclusions briefly describe the expected trends of inter-, trans-, cross- and multidisciplinary education in economics, relating to business, approached as *any job well done*, from several scientific viewpoints.

Keywords: higher education, inter-, trans- cross-, and multidisciplinary, business

JEL Classification: A22, A23, C46, I23, I25, M21

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Introduction

Three major approaches dominate the history of education and knowledge over two and a half millennia, one based on *adaptation and harmonization to specific needs "here and now"*, which is also considered as the classic educational variant and having Socratic and Platonic origins, and also Kantian and Hegelian origins, and a second one, focusing on evolutionism, and usually defined as *innovative education*, both Darwinian and Spencerian, but also Schumpeterian in the sense of a genuine educational process of *"creative destruction"*, in which the structure of the prior educational process is broken to make way for another (Heilbroner, 2005; McCraw, 2007), and a third one, specific mainly to the last century, which ended a decade and a half ago, a type of *education focusing on addressing "logical atomism" or a new scientific and disciplinary realism*.

Classical education was a process widely recognized through the apparent duality of its final product, an educated generating people more informed by Socratic dialogue, and at the same time an education characterized by the written or oral course of lectures and the specific educational space, in the Platonic spirit. The origins of higher education, including the economic one, are in the classical Greek confidence (as the Greeks also coined the concept of academia itself) in reason, and in the mediaeval faith in the good order of the universe (as scholastics and its supporters brought about certainty in education and order, no less than the monotony and routine of the classic educational processes, often turning the well-ordered universe into a "paralyzed" one).

The innovative educational process was the first having a systemic nature, moving upward through four phases.

The first phase was to design an educational idea, scientifically based (generated by the creative spirit, creative imitation or inspiration, later redefined as research and development capacities).

The second phase consisted of a translation of the educational idea into a qualified partnership between entrepreneurship and the educational institution, with new forms of funding and focused on new technological processes, new functional structures, new organizational forms, new methods of management in education, naturally followed by the third stage, which was dictated by a strong, efficient and extensive protection of intellectual property elements that should be an opportunity to create new benefits, the result of a process that ensures a share of the educational value added growth.

The last phase in innovative education pursued an increased impact of the outcome of the process of innovation on the educational market (a new educational product or a new educational service, a new form of applying and integrating them, a new functional structure, a new organizational form, new methods of management and organization of education, etc.) through a network of local, regional, national and even international capitalization.

Educational evolutionism has played down, and is still rejecting to an extent difficult to accept, the logic of mathematics, physics, etc., which has had, and still has, major implications for higher education, with a focus on that of economics, transforming economics into a slightly causal philosophy, yet impossible to test in keeping with Bergsonian reasoning (Wheeler, 1922). Evolutionism, as an educational approach, has been criticized for trying to identify and the belief of allegedly having found a general law of the

universe (including the economic one). The famous economic convergence, which today ends up in group or club convergence, confirms the fact that the evolutionist educational approach, in its essence, even having had major elements, has remained a "hasty" generalization, which incoherently destroyed the boundaries in science and between disciplines, particularized university education, forming specialized skills (economic, medical, engineering, literature, etc.), focused on sciences and disciplines, not knowing, in an exaggerated evolutionary environment, where it begins or where it ends. From Aristotle's to Descartes' logic, systematization and generalization as elements of educational processes, dominated not only education, but also research and human knowledge itself, the definitive and the seemingly immutable character of the economic theories turned higher education in the economic field into an incompleteness covering all education and closing it, also blocking its dialogue with other categories of education, as well as its ability to identify future.

Logical atomism or new educational realism was considered similar to the change made by Galileo Galilei in physical thinking (Galilei, 1961), through its profound impact and the real progress recorded in the educational process "ensuring the replacement of educational generations who had apparently comprehensive knowledge, yet untested by partial, detailed and verifiable results" (Russell, 1996), with specialized generations, rigorously tested in terms of the skills acquired in narrower areas of knowledge, but more pragmatic and hence dominantly applicative.

This new approach structured skills provided both by the atomization of education and the logic of informational energy level attained in knowledge within a distinct and well-defined domain, including the professional course, corresponding to a number of practical areas, and it allowed the emergence of an integrated education thinking towards the future, which in economic education also widened the credibility of forecasts and estimates, thus extrapolations with lower margins of error also become possible in economic higher education, especially in business.

From classic to innovative, and farther up to logical atomism or educational realism, it was demonstrated that too general approaches, as well as those finally finished or standardized, are completely inadequate to the dynamics or evolution of reality and its knowledge, which includes the economy and business.

The reality of the new millennium emphasizes three general trends in education, which develop increasingly evidently and capture certain areas of the educational space, the first specific especially to the last two decades and resulting from the educational approach based on *inter-, trans-, cross- and multidisciplinary* (Nicolescu, 1996; 1999; 2002; 2008), the latter, which seems rather to represent the long-term future, predicted a phenomenon deschooling or de-institutionalization of the classical university (Hannoun, 1973), based on *self-selection and assisted self-shaping and the individualized or personalized curriculum* (Malița, 2009; 2014), and the third became a natural consequence of the more rapid pace of technology in education, and especially educational communication or dialogue; it can be defined as Internet education or dominantly virtual education (*e-education*) bringing together e-learning in the narrow sense, as well as u-learning, or online ubiquitous education (Ubiquitous Learning), customized by m-learning (mobile learning or phone), or VLE (virtual learning education) or SAT-learning (satellite education), etc. (Rajwant, 2003, Van Raaij, Schepers, 2008; Beetham, & Sharpe, 2013).

In a more detailed analysis, all these approaches, both the three major and historical ones, and the three contemporary ones, which are also connected to the future of education, can be found in the national higher education system in the field of economics, and especially in the field formative of skills in business

The main aim of the present paper is the analysis of the opinions of students and academic graduates as to the inter-, trans-, cross- and multidisciplinary approach to economic higher education in business; after this brief introduction, its structure is comprised of three main sections, one devoted to the review of literature on inter-, trans-, cross- and multidisciplinary, both as partial paradigms, and combined as the contemporary educational multiparadigm, another one focused solely on the research methodology, and the final section analyzing and discussing the main results of the investigation conducted. The conclusions do not fail to make the necessary reference to the inter-, trans-, cross- and multidisciplinary approach to education in the future, which is already intertwined with self-selection through tutorial support and assisted self-shaping, as well as individualized or personalized curriculum, creating a modern education with an increasingly dominant virtual support (e-learning, and especially VLE).

1. Inter-, trans-, cross- and multidisciplinary literature review

Inter-, trans-, cross- and multidisciplinary means first of all and one by one partial paradigms. Unlike Thomas Kuhn (1970), whose paradigm is schematic, hierarchical and structured, or Herbert Feigl (2004), where the paradigm is rigorously layered, in an appropriate visual representation, through a genuine successive conceptual network, which is also nuanced and innovative in the processes of education and getting knowledge, the multi-paradigm of modern economic education grows on the “ground” of empirical observations, defining a distinct spectrum of experience in a particular area of reality (business area), then passing through empirical and non-homogenized concepts from entrepreneurial way of thinking, which are however subsequently defined theoretically to form the foundations of the partial paradigm of inter-, trans-, cross- and multidisciplinary combined with the nuanced coverage of logic and approached cyclically (from innovative nuanced concepts and variables to methods and models), eventually configuring a network, through a system of specific postulates, techniques, instruments and algorithms for calculating, a real metatheory about business and entrepreneurial spirit education and formation, which is still in the evolutive stage of its maturation.

Following the three stages of development of economic thinking in the business domain, a set of partial paradigms, approached as combined networks, redefine, thoroughly inter-, trans-, cross- and multidisciplinary in a new aggregative concept of meta- or multiparadigm, as a modern, phased and adequate solution of exploring a number of complex phenomena from market economies and from disparate perspectives, through methods and models with distinctly scientific and disciplinary origin, and provide help and pragmatic competencies to the young students and graduates (Figure no. 1)

The new way of education, focused on this modern multiparadigm includes “appetite” for the variation, refining and nuance, and rigorous cyclicity in contemporary economic business investigation and amplifies, by methods and models of a pure origin, the processes of inter-, trans-, cross- and multidisciplinary, contributing to the emergence of new disciplines and new curricula.

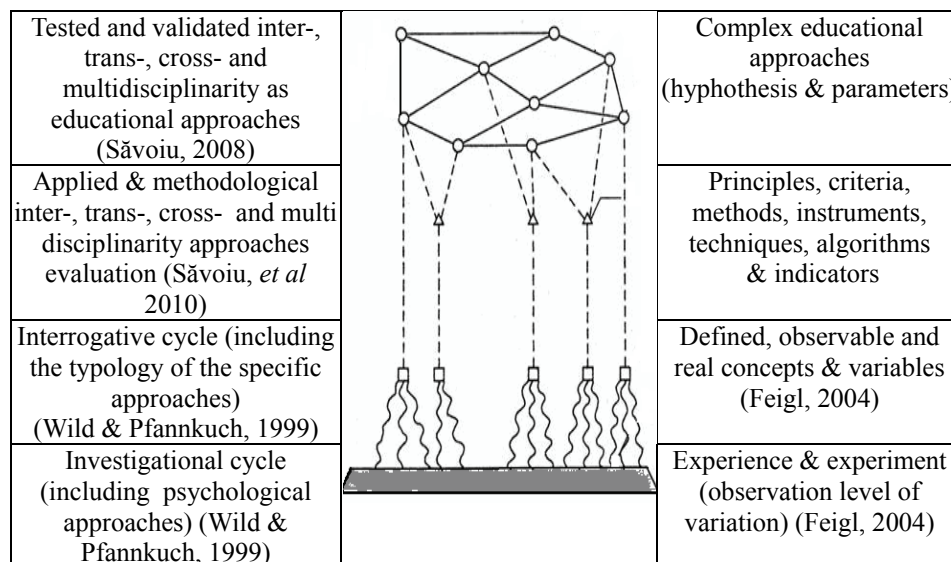


Figure no. 1: The conceptual support of modern inter-, trans-, cross- and multidisciplinary multiparadigm in a vision of the type Feigl, generalized through Wild & Pfannkuch cyclical methods and models

Source: The support of inter-, trans-, cross- and multidisciplinary approaches is rendered graphically as a result of its characteristic partial paradigms, on the right hand (Feigl, 2004), and its process cyclicity, on the left hand (Wild & Pfannkuch, 1999) and below the inter-, trans-, cross- and multidisciplinary trend towards the educational methods and models becoming universal (Săvoiu, 2008; Săvoiu, et al., 2010).

In this way an innovative multiparadigm of inter-, trans-, cross and multidisciplinary is delimited in the modern economic scientific education, under the impact of today's paradigmatically thinking, which leads to a third-degree variation, nuance and cyclicity, which results in an economic business multiverse composed of distinct universes, exposed to principles characteristic of an increasingly holistic modern thinking.

The terms inter-, trans-, cross- and multidisciplinary have a common origin, as noted in the conceptualization of the discipline and science, defining forms of antinomy of a multiverse of disciplines and sciences (the former category already exceeding 8000 disciplines as distinct entities according to bibliometric classifications, and the latter approaching, in keeping with relatively recent surveys, more than 1000 well delimited sciences) in relation to unidisciplinarity, addressed in a limited, closed and slightly derogatory sense, as a unique, isolating discipline.

Unidisciplinarity, in an open sense, without the claim or intention to know everything related to one disciplinary field, is and will remain a natural and creative early stage of scientific knowledge or epistemology. This general aspect is subject to a natural law of studying diversity in a homogeneous manner, or to the fact that the heterogeneity in the reality investigated in a scientific or disciplinary manner must be theoretically explained by homogeneity. The premises of the more and more intense development of this process are

related to both the ontological nature of the sciences and disciplines separated from various areas of reality or specific universes composing their multiverse as a coherent set of a logical nature, and also of a general gnoseological essence, or, more specifically, strongly epistemological and educational.

Interdisciplinarity designates establishing relationships between several disciplines and, beyond its aim, nuanced and diversified compared to unidisciplinarity, be it open, it involves phenomena, concepts and general laws that are common to several disciplines, investigated with common methods and models, it analyses and highlights, in a varied context, multifaceted issues and diverse opportunities for knowledge of reality but also for educational purpose. As a first conclusion, interdisciplinarity favours horizontal transfer of knowledge from one discipline to another, from one formal type of education to another (e.g. from mathematics to economics) which reshapes, permanently and by extension, the limits of a map tending towards completeness of knowledge and education, and requires cooperation with other disciplines.

All the above aspects engender a process of specialization that constantly gives rise to new subdisciplines, and another one, of fusion, which anticipates the potential rebuilding of new disciplines. In modern educational thinking, interdisciplinary is simultaneously disaggregative and aggregative, within completely different areas of scientific knowledge and education. Basarab Nicolescu reconceptualises interdisciplinarity as a three-grade transfer of methods from one discipline to another, ontologically, logically and epistemologically, finally allowing to determine the epistemological isomorphisms and homomorphisms of a discipline into another, with a major impact on their development, and thus describes an extended typology of interdisciplinarity, from interdisciplinary fields to interdisciplinary areas of reality and interdisciplinary methods, models, concepts and even interdisciplinary education (Nicolescu, 1999).

Among the transfers of methods and models specific to interdisciplinarity from one science to another, apart from the *applicative* and *epistemological* (cognitive) transfer, the transfer *generating new disciplines and new educational modalities* is becoming increasingly significant and important (dominated by the transfer of methods and models), also caused by the high complexity of the problems investigated.

An illustration of the fact that this type of transfer is practical and continuous, can start with a first interdisciplinary transfer, that of statistical thinking in biology, defining biostatistics, and can continue with a transfer of the methods of the statistical-mathematical type in economics, configuring econometrics, the first science born at the intersection of three scientific ways of thinking, and can finally conclude with a third transfer, this time fluent and complex, that of the econometric model, within the space of financial economy, saturated with uncertainty, which generated, by the probability theory, the science of financial econometrics and the econometric financial model (Săvoiu, Manea, 2013), bringing together a large family of models, and selecting only those of the ARCH and GARCH type, which represents an important proof of the specific approach of modelling interdisciplinarity.

Interdisciplinarity is simultaneously a process of focusing or concentration on issues that are not only complex and global, as education itself, but also placed at intersection points, at the border or in the interstitial spaces of several sciences or disciplines, but in this case, too, the interlocking of the methods and models, as well as the coordination of the research and education may end in adopting a common and general body of theory, methods and

models, that is delineating a new field of knowledge, a new science or a new type of specialized education (e.g. economic education, inside business field).

Interdisciplinarity proves relatively more innovative, heterogeneous, auxiliary, complementary and dissipative, but also unifying, apparently linear, but frequently structured and even restrictive, preserving the originality and creativity of *sui generis* scientific and educational interrelation.

Transdisciplinarity appears between disciplines (sciences), along them, and sometimes even over them, and is considered a superior final form of interdisciplinarity (Nicolescu, 1996), which involves concepts, principles, language and finally even theory, in parallel with methods, methodology and models, which tend to become universal, dynamically generated by the action of the many levels of reality (systems theory, information theory, theory of scientific modelling, etc.). Basarab Nicolescu uses the following methodological postulates in defining transdisciplinarity, not only in research fields but also in the educational areas: a) the existence of levels of reality; b) the logic of the included middle; c) and complexity (Nicolescu, 2008).

In the opinion of the authors Săvoiu and Iorga-Simăn (2011), transdisciplinarity represents maximized interdisciplinarity, but finally and ideally identifies itself with the *to-the-extreme* form of complex multidisciplinarity, defined as educational (academic) purposefulness, in the explosive sense of an ample dissolution of all disciplines or sciences into one, a complex fusion into a huge scientific universe (epistemological multiverse).

Multidisciplinarity involves simultaneous application of the thinking of several sciences and disciplines, and also involves the study and research of a domain of reality being achieved from several angles, descended from the multiplied thinking of several sciences or types of education simultaneously. Both the researcher and the teacher, and the researched area or the area of reality under multidisciplinary scrutiny and the applied competencies for students and graduates, will ultimately be richer, depending on the outcome of the research. Multidisciplinarity, as a form of intertwining disciplines, consisting in the juxtaposition and additioning of certain elements of various disciplines, highlights their common issues, and entails a symmetrical communication between various specialists coming from different disciplines, who bring together their different way of thinking and turning to good account, their concepts or languages, methods or models, in their own axiometry.

Simple or complex multidisciplinarity does not mean mere juxtaposition or coexistence of several disciplines in the same area of reality, but rather a passage, through interdisciplinarity (permanent informational and methodological transfer from one discipline to another) to transdisciplinarity. Maximizing or *to-the-extreme* development of the trend of multidisciplinarity aims at the complete and complex dilatation of scientific knowledge, meaning a vast dissolving of sciences into a single one, a complex fusion into a huge single science or discipline.

Inter-, trans-, cross- and multidisciplinarity as ways of interaction of modern sciences, and especially of their specific way of thinking, are able to induce formation trends and generate new sciences and new modalities of education, with varying degrees of coverage with respect to the source or sciences origin or to the classical educational methods (Figure no. 2).

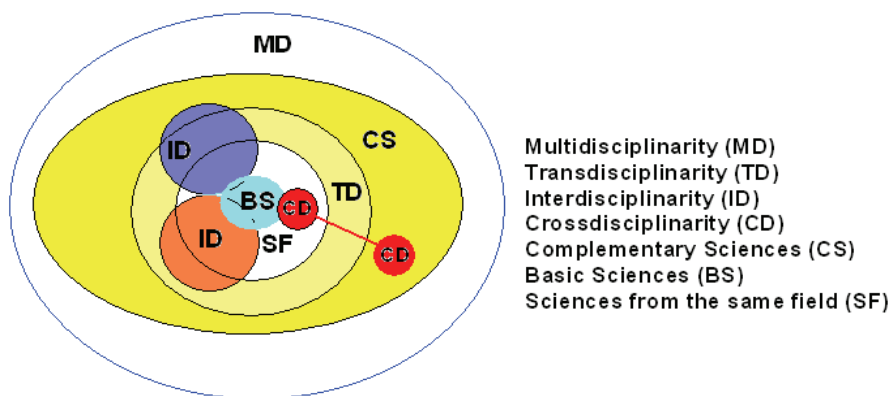


Figure no. 2: Inter-, trans-, cross- and multidisciplinary in the contemporary universe of sciences, disciplines and educational approaches

Source: The graphical synthesis of the concepts has been realized by the authors

Crossdisciplinarity is the approach which uses mixing, associating or combination; it represents the generic theoretical concept for all three previous theoretical delineations, combining any type of mixture or combination of disciplines; more recently, it has been particularized through the fact that it can explain and address aspects relating to a discipline through the terminology, the instruments and even the methods of other discipline(s).

Inter-, trans-, cross- and multidisciplinary have become, in the current multiverse of modern science, but also in the academic education (including education in economics), important processes with respect to their impact in the vast area of scientific and educational thought, but also in their taxonomy, if we only mention the famous problem of circularity of formal systems, a problem that finds that the wish to express knowledge in a formal way is illusory and that there are, relatively simple assertions or theorems in the major formal logical systems or in the related systems, which cannot be solved in that system, as the respective assertions and theorems in the model analysed are neither provable nor indemonstrable, from the logic point of view, such as Gödel's famous incompleteness theorem (Willard, 2001)..

An academic educational process focused on a modern approach, as is the case of inter-, trans-, cross- and multidisciplinary, becomes a business model either of the "double helix", describing the relationships of the type educational entity – company or firm (Giarini, Malița, 2005) or the "triple helix", detailing specific relations educational entity – company or firm – entity in the central and local government (Etzkowitz, 2002), can be successful in the economy, especially in the domain of business, if the new knowledge is assimilated in the concrete conditions of the educational entity, creating value in the following ways: a) generating flexibility and operational-education efficiency; b) attracting new participants in the processes or entering a new, more extensive education new; c) increasing the satisfaction and impact of education on contact with the actual labour market; d) improving supply through new products and new educational services (from new skills to new specializations and programmes, closer to the requirements of actual regional or territorial

markets); e) redefining the educational process and model in economics, in the field of business.

The most important consequence of an educational process addressed inter-, trans-, cross- and multidisciplinary in economics and especially in business, however, remains that of the formation of a new mentality and a new culture in higher education, which can lead to a new education system at maximum performance, for the benefit of the entire Romanian society. Hence the importance of investigating and quantifying mentality, in a differentiated manner, primarily among students, and then among graduates face strictly faced with the labour market, seeking to assess a number of skills materialized in *characteristics* such as: a) *a view of the business in perspective* (anticipatory spirit in the market events); b) *the power of perception* in business and various markets; c) *flexibility of business thinking* in terms of sudden changes (spiritual vitality and entrepreneurial attitudes); d) *business intelligence* (spirit of complex understanding, not only scientific or concrete, or exclusively economic spirit, but also moral, ethical, social, etc. attitudes) (Săvoiu, Vladu, 2012).

Addressing contemporary European higher education in a inter-, trans-, cross- and multidisciplinary manner, given that it has already become cross-cultural in economics and especially in business, is redefined cyclically via four stages (Dubosson-Torrey, 2010): a) acquiring practical experience and skills; b) reflections focused on observations; c) moulding the ability to materialize abstract concepts; d) testing the educational process in new situations. (Lüsebrink, 2005; Barmeyer, 2007). Students and graduates finally turn, through their opinions, into relevant factors to be taken into account when developing an educational programme of academic study in business, as their views largely reflect the market and society, increasingly turned themselves into inter-, trans-, cross- and multicultural areas (Teichler, 2007).

2. Methodology

A research of students and future graduates' views (i.e. first and second year students, and students in their final year of undergraduate education, in the academic year 2012-2013) is naturally necessary to assess and quantify, in a differential manner, the mentality of students and graduates in the University of Pitesti, with exclusive reference to the Faculty of Economics (ESF).

Determining the size of the sample taken, in practical terms, was done in order both to evaluate the limit duration and specific period of research, and to organize the gathering of data, representing the views of students and graduates, captured as variables of questions listed in a questionnaire specifically designed for the present paper. Out of the 1,430 students and 616 graduates of all programs of study and specializations in the ESF, only 122 students and 50 graduates were in the specialization of business management related to entrepreneurship training. In calculating the size of the sample taken, instead of the original population dispersion, a maximum dispersion was made use of, for the simplicity of

calculation : $\sigma^2 = \frac{(X_{\max} - X_{\min})^2}{4}$ or $\sigma^2 = w(1-w)$ for an alternative or binary variable, the

value sought was 0,25. To determine the size of sample (n) under simple, unreplicated random sampling, as accurate and appropriate in practical terms, its value was increased

beforehand (Săvoiu, 2012), with a relative level of non-responses (R_2) of about 10%, from similar previous research conducted among students:

$$n = \frac{z^2 \times w(1 - w)}{(\Delta_w)^2 + z^2 \times w(1 - w)/N} \times (1 + R_2/100) \quad (1)$$

where: $\Delta_w = 0.05$; $z = 1.96$ for a signification threshold which is again maximum possible $\alpha = 0.05$ and a dispersion $w(1-w) = 0.25$ pentru $N=122$ and $(1+R_2/100) = 1.1$.

The *sample volume* which did not include a further number of respondents intended to ensure the non-response, is 92.59, i.e. 93 students. This volume is virtually identical to that resulting from the simplified calculation according to Taro Jamane's relation (Șerban, 2004), for populations of low volume, where $n = N/(1+N \times \alpha^2) = 93.48$, and, after the inclusion of non-response rate, it is 102.

This volume of the sample was an acceptable variant from a practical and theoretical standpoint; to practically conduct its extraction, the *sampling technique* was that of the mechanical counting step (manual selection), where the mechanic step $k = (N:n)$, or $k = 122:20 = 6.1$, which was finally approximated as $k = 6$, being originally exploited to eliminate those who did not respond to the questionnaire. The number of fully completed questionnaires was 98, which translates into a final poll error of 4.48%.

The main assumptions of the statistical research start from the stated objective of the paper, i.e. to analyse the opinions of students and graduates relating to the inter-, trans-, cross- and multidisciplinary approach to economic university education, in the field of business, at the Faculty of Economics of the University in Pitesti, within the specialization programme of business administration, and also the questionnaire of that research, as presented in Annex no. 1.

The concrete hypotheses of this survey of student opinions are detailed summarily below:

- I. the significantly different ranking between the four components of the inter-, trans-, cross- and multidisciplinary approach to economic university education in the field of business;
- II. the existence of significantly different notations, between real and ideal, in inter-, trans-, cross- and multidisciplinary approach to economic university education in the field of business;
- III. the existence of significantly different notations, between the impact of inter-, trans-, cross- and multidisciplinary approaches in Romania and in the EU;
- IV. identification of the student's views of the future of economic studies in higher education, especially in business;
- V. significantly different weights of the trends in Romania and EU with respect to the future of higher education, in the field of economic studies, especially in business, according to the opinions of students.

From the analysis of the data series resulting from the opinions expressed by 98 respondents, all students of the University of Pitesti, the Faculty of Economic Sciences (ESF) and Business Administration, several important and relevant aspects could be

observed regarding the impact of inter-, trans-, cross- and multidisciplinary approaches to economic higher education in business.

3. Results and discussion

The research conducted on the sample population of 98 students of the University of Pitesti, the Faculty of Economic Sciences (ESF) and Business Administration, identifies a dominant population of 65 females (66.3%) with a mean age of 21.8 years, living in urban at a rate of 70.4%, employed only at the level of 37.8% (mostly in part-time or flexible hours), and planning to open their own business in about 7 in 10 cases (68.4%, respectively).

A first set of results concerns the validation or invalidation of the assumptions, and the second set tries to associate the annual average grade of the students with their evaluations on modern approaches to education, with the help of a correlation matrix. Association of the first hypothesis about a significantly different ranking among the four components of the inter-, trans-, cross- and multidisciplinary approach to economic university education in the field of business is validated according to the descriptive statistics of the database drawn from questions 1-4 of the survey questionnaire. As can be noted, cross-disciplinarity is better appreciated as a contribution to the economic education of students in business, followed by multidisciplinary, interdisciplinarity, with a low level for transdisciplinarity (Table no. 1).

Table no. 1: Descriptive statistics of the variables for assessing inter- (ser01 and 01a), trans- (ser02 and 02a), cross- (ser03 and 03a) and multidisciplinary (ser04 and 04a), in parallel with the annual average of the students

	SER01	SER01a	SER02	SER02a	SER03	SER03a	SER04	SER04a	SER09
	interdisciplinarity		transdisciplinarity		crossdisciplinarity		multidisciplinary		Average note per student
Mean	6.785714	9.418367	5.581633	8.989796	7.122449	9.459184	7.020408	9.316327	7.413673
Median	6.000000	10.00000	5.500000	9.000000	7.000000	10.00000	7.000000	9.000000	7.160000
Maximum	9.000000	10.00000	9.000000	10.00000	9.000000	10.00000	9.000000	10.00000	10.00000
Minimum	4.000000	8.000000	4.000000	7.000000	4.000000	8.000000	4.000000	6.000000	5.500000
Std. Dev.	1.294317	0.716858	1.307579	0.855484	1.212183	0.748447	1.369623	0.807145	1.185839
Skewness	0.231438	-0.808409	0.668978	-0.576411	-0.584900	-0.972312	-0.424058	-1.223189	0.675211
Kurtosis	2.121098	2.356344	3.061870	2.752298	2.954228	2.461509	2.409744	4.825032	2.484261
Jarque-Bera	4.029117	12.36594	7.325312	5.677275	5.596316	16.62543	4.359782	38.03834	8.532631
Probability	0.133379	0.002064	0.025664	0.058505	0.060922	0.000245	0.113054	0.000000	0.014033
Sum	665.0000	923.0000	547.0000	881.0000	698.0000	927.0000	688.0000	913.0000	726.5400
Sum Sq. Dev.	162.5000	49.84694	165.8469	70.98980	142.5306	54.33673	181.9592	63.19388	136.4029
Observations	98	98	98	98	98	98	98	98	98

Source: The data in the 98 questionnaires were processed using the Eviews software.

The series that are exclusively numbered, i.e. noted numerically, (e.g. ser01) represent the opinions of students about the real educational approach, and the series accompanied by letter a (e.g. ser01a) contain opinions about the ideal approach.

Specifically, a testing focused on *t* test largely validates the significant differences between the four concepts of modern educational approaches of the inter-, trans-, cross- and multidisciplinary type (Table no. 2)

Table no. 2: Testing the significant differences between the views of students about inter-, trans-, cross- and multidisciplinary

Test for Equality of Means Between Series ser01 - ser02				Test for Equality of Means Between Series ser01 - ser03			
Sample: 1 98 Included observations: 98				Sample: 1 98 Included observations: 98			
Method	df	Value	Probability	Method	df	Value	Probability
t-test	194	6.478707	0.0000	t-test	194	1.879815	0.0616
Anova F-statistic	(1, 194)	41.97365	0.0000	Anova F-statistic	(1, 194)	3.533704	0.0616
Test for Equality of Means Between Series ser01 - ser04				Test for Equality of Means Between Series ser02 - ser03			
Sample: 1 98 Included observations: 98				Sample: 1 98 Included observations: 98			
Method	df	Value	Probability	Method	df	Value	Probability
t-test	194	1.232911	0.2191	t-test	194	8.554771	0.0000
Anova F-statistic	(1, 194)	1.520070	0.2191	Anova F-statistic	(1, 194)	73.18411	0.0000
Test for Equality of Means Between Series ser02 - ser04				Test for Equality of Means Between Series ser03 - ser04			
Sample: 1 98 Included observations: 98				Sample: 1 98 Included observations: 98			
Method	df	Value	Probability	Method	df	Value	Probability
t-test	194	7.521827	0.0000	t-test	194	0.552297	0.5814
Anova F-statistic	(1, 194)	56.57788	0.0000	Anova F-statistic	(1, 194)	0.305031	0.5814

Source: The data in the 98 questionnaires were processed using the Eviews software.

The final results of the testing show that there are significant differences of opinion between the interdisciplinary approach and the trans- and multidisciplinary approaches (the students perceive them as being as different, in keeping with their own grading, and especially their averages), as well as between the disciplinary approach and the crossdisciplinary approach, or between the transdisciplinary approach and the multidisciplinary approach. A negative aspect could be revealed by the lack of a significant difference of opinion between the multidisciplinary approach and that crossdisciplinary one (which are almost similar in the opinion of the students) and relatively similar between the interdisciplinary and cross-disciplinary approach (the latter similarity is relatively more normal conceptually, as common disciplinary gaps are assimilated with methods and tools that are common in different disciplines).

Another hypothesis about the existence of a significantly different notation between what is real and what is ideal in the inter-, trans-, cross- and multidisciplinary approaches to economics higher education in business is also revealed and validated by the same table, complemented by another, more synthetic one, concerning the gaps between real and ideal approach in the students' opinion (Table no. 3), which retains the same hierarchies and confirms a general consistency of these views.

Table no. 3: The gaps between the real and ideal approaches to inter- (ser01 and 01a), trans- (ser02 and 02a), cross- (ser03 and 03a) and multi disciplinarity (ser04 and 04a) in average, minimum and maximum values, and standard deviation values

Decalaje (Δ) Ideal - Real	SER01a - SER01 interdisciplinaritate	SER02a - SER02 transdisciplinaritate	SER03a - SER03 crodisciplinaritate	SER04a - SER04 multidisciplinaritate
Mean	2,632	3,409	2,337	2,295
Median	4,0	3,5	3	2
Maximum	1,0	1,0	1,0	1,0
Minimum	4,0	3,0	4,0	2,0
Std. Dev.	- 0,577	- 0,453	- 0,464	- 0,562

Source: Data from the 98 questionnaires that generated Table no. 2.

Even gaps remain relatively homogeneous, except for the multidisciplinary approach at a minimum, where hierarchies are slightly reset, and gaps between mean and median values reconfirm the original hierarchy established in the opinions of students.

The hypothesis relating to the existence of significantly different assessments or grading, between the impact of inter-, trans-, cross- and multidisciplinary approaches in Romania and the EU is placed in a similar way as to the distance between the real and the ideal in modern economics education in business administration (averages of 6.89 and 9.59, respectively, express a substantial gap in students' opinions as summarized in figure no. 3):

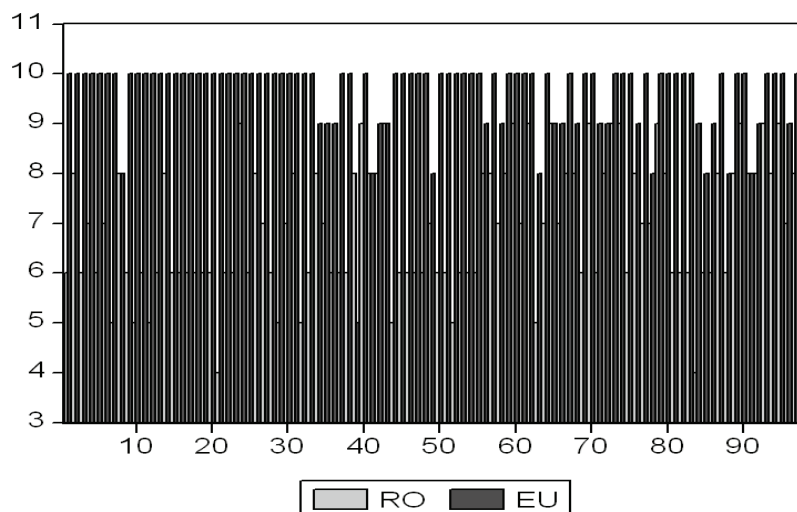


Figure no. 3: The different impact of the inter-, trans-, cross- and multidisciplinary approaches in Romania and EU, in keeping with the students' opinions

Source: own computations

The analysis of student opinions about the future of education in economics studies, in higher education, in the field of business, especially in business administration, identifies the the main approach needed in economics, especially in business, in Romania, in the "excessively pragmatic approach focusing solely on what you can do", with 55.1%, followed by the "approach through experiment and testing in new situations" with 25.5%, the "modern inter-, trans-, cross- and multidisciplinary approach", placed only in third

position, with 18.4%, whereas in the European Union the same as the previous approach, which is also part of the title of the paper, is considered the first necessity, with 46.9%, followed, in a relatively close position (42.9%), by the “approach by experiment and testing in new situations” (questions 6 and 6a)

The assessment of the trends, in Romania and the EU, in the future of economics studies in higher education, especially in business, according to the opinions of students, ranks the “modern inter-, trans-, cross- and multidisciplinary approach” in first position in Romania, with 64.3%, the second position being occupied by the “approach focusing solely on e-education”, with 25.5%. for the same question, the students identify, in EU, “life-long learning / education” as the topmost future approach, with 52%, followed by the approach based on “individualized or personalized curriculum”, with 21.4%, and the “modern inter-, trans-, cross- and multidisciplinary approach”, with 14.3%. (questions 7 and 7a)

Another interesting set of results concerns the association between the variables generated by grading the inter-, trans-, cross- and multidisciplinary approaches and the annual average of respondent students (taken from the official data of the specialization of business administration), as can be noted in the correlation matrix in Table no. 4:

Table no. 4: Matrix of correlation between student grades and their views of inter-, trans-, cross- and multidisciplinary educational approaches

	SER01	SER01a	SER02	SER02a	SER03	SER03a	SER04	SER04a	SER09 Average note per student
	interdisciplinarity		transdisciplinarity		crossdisciplinarity		multidisciplinarity		
SER01	1.000000	-0.291268	0.494712	-0.281312	0.214021	-0.088937	0.043201	-0.279833	0.403928
SER01a	-0.291268	1.000000	-0.141295	0.410487	0.106533	0.406842	0.138216	0.517249	-0.057491
SER02	0.494712	-0.141295	1.000000	-0.215827	0.026149	0.040309	0.114190	-0.176124	0.139759
SER02a	-0.281312	0.410487	-0.215827	1.000000	-0.028607	0.248910	-0.105404	0.557139	-0.116727
SER03	0.214021	0.106533	0.026149	-0.028607	1.000000	0.187376	0.631852	0.054834	0.297318
SER03a	-0.088937	0.406842	0.040309	0.248910	0.187376	1.000000	0.242188	0.320237	0.059178
SER04	0.043201	0.138216	0.114190	-0.105404	0.631852	0.242188	1.000000	0.143309	0.021725
SER04a	-0.279833	0.517249	-0.176124	0.557139	0.054834	0.320237	0.143309	1.000000	-0.097303
SER09	0.403928	-0.057491	0.139759	-0.116727	0.297318	0.059178	0.021725	-0.097303	1.000000

Source: The data in the 98 questionnaires were processed using the EvIEWS software.

There is a potential association between the average resulting from the student grades and their opinions of interdisciplinarity and multidisciplinary, of a relative intensity, that is slightly closer to the average in relation to interdisciplinarity, and weak, but liable to testing by further research, in relation to multidisciplinary, which makes their opinions of these educational approaches more credible, and probably more realistic (Săvoiu, 2013).

Conclusions

The ranking done by the students in the domain of their economics education, especially in business administration, according to the opinions they expressed, by placing cross-disciplinarity at the fore, in relation to multidisciplinary and interdisciplinarity, is relatively consistent and reflects a reality of national economic academic education, yet placing

transdisciplinarity at the lowest level is a significant negative aspect, as that approach is actually much more necessary to a genuine entrepreneur, who must always have an integrative view of the market and disciplines as such.

The maturity of student opinions is revealing with respect to the approaches concerning the European Union and the ideal evaluation of the inter-, trans-, cross- and multi-disciplinary approaches ideal, but it slightly lags behind as far as Romania is concerned, by the ranking of excessive pragmatism, of experiment and testing new situations in economy, without opting for approaches to business based on the appropriate solutions, with a much higher coverage, of the new inter-, trans-, cross- and multidisciplinary sciences, from econophysics to sociophysics, from financial econometrics based on thermodynamic models to quantum economics, etc.. (Săvoiu, 2012).

The transdisciplinary approach remains paramount in business administration in spite of the students' final hierarchies. *Cogito* cross-, multi- and interdisciplinarily, but especially transdisciplinarily, *ergo sum*... an entrepreneur.

There is a reality partially unfavourable to the development of inter-, trans-, cross- and multidisciplinary approaches in Romanian economic education, especially in business administration, characterized by:

- a) obvious isolation trends at the level of the disciplines, courses, departments or sub-departments, faculties, etc., negatively cumulative and having excessively theoretical developments;
- b) the gap between scientific research and the practical subjects taught increases instead of decreasing, in the field of business administration as an educational field of economics;
- c) neither clear actions, nor major educational policies are to be expected, which could encourage short- or medium term inter-, trans-, cross- and multidisciplinary approaches;
- d) although nearly all practical problems in business are multi-causal and multidisciplinary, educational solutions do not match them by similarity at an equally quick pace.

However, there are inherent positive steps, by multiplying the complex optional disciplines and training focusing on interdisciplinarity and crossdisciplinarity (from financial accounting analysis to financial econometrics, etc.)

A future of education in which teachers will become tutors or mentors, where teachers' desks will disappear, just like course books and lecture-rooms with desks and chairs, , but where academic education institutions will be like octagonal beehive frames containing laboratories, small rooms devoted to Internet- assisted dialogue or completely free dialogue, where computers, in different shapes and features, endowed with the most diverse software, will be universal assistants, silent and efficient servants, who can easily change the manner of presenting knowledge, collecting, evaluating and processing materials, drafting conclusions and identifying complex evolutionary scenarios.

The future economics and entrepreneurship student will certainly benefit by his/her *personal curriculum*, as Academician Mircea Malița anticipated many years ago; individual learning will separate him/her from all the others along an original itinerary, accompanied only by the same good friend the computer, communicating on the Internet, reading e-books, accessing ever more detailed Wikipedias, and also practicing specific activities in an insurance company or a bank, or experiencing intervention into the sphere

of administration public services or in the economic area of public entrepreneurship. Then, revived, the young student will enter a team project with others like him/her, which they will finish and provide it to the community, thinking in terms of the inter-, trans-, cross- and multi-professions they will practice during surprising careers.

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ANNEX no. 1

QUESTIONNAIRE

The questions in this questionnaire are designed to collect information on your views about the inter-, trans-, cross- and multidisciplinary approach to university education in the field of economics, in the subfield of business, more specifically in business administration.

Preliminary information.

Forename:	Name:	1. Gender <input type="checkbox"/> F <input type="checkbox"/> M	2. Age <input type="checkbox"/> <input type="checkbox"/>
3. Resident of Pitesti	1. <input type="checkbox"/> Yes 2. <input type="checkbox"/> No	4. Average note <input type="checkbox"/> <input type="checkbox"/> . <input type="checkbox"/> <input type="checkbox"/>	5. Employed 1. <input type="checkbox"/> Yes 2. <input type="checkbox"/> No
6. Do you intend to open your own business? 1. <input type="checkbox"/> Yes 2. <input type="checkbox"/> No		7. Do you target a BA position ? 1. <input type="checkbox"/> Yes 2. <input type="checkbox"/> No	

A. Evaluation of inter-, trans-, cross- and multidisciplinary approaches (real and ideal) in ratings from 1 to 10

In this section of the questionnaire, you appreciate and evaluate, by simple scoring from 1 to 10, according to your opinion, to what extent the four approaches, inter- trans-, cross- and multidisciplinary, exist in economics university education, principally in business, and to what extent the same is true of the academic education that you are receiving, or have received, in the study specialization you attend. In parallel, be specific about the level, as expressed in grades, up to which all those approaches should ideally exist in your education.

When you think of interdisciplinarity, do you start from the relation *Inter* = "between" (intersects/connects disciplines)?

1. On a scale from 1 to 10, indicate the grade you would give, for this question, to the interdisciplinary educational approaches that you were actually offered in the field of business administration? ☐ ☐

1a. What should it be ideally? ☐ ☐

When you think of transdisciplinarity, do you start from the relation *Trans* = "with; beyond" (sums up / integrates disciplines)?

2. On a scale from 1 to 10, indicate the grade you would give, for this question, to the transdisciplinary educational approaches that you were actually offered in the field of business administration? ☐ ☐

2a. What should it be ideally? ☐ ☐

When you think of multidisciplinary, do you start from the relation *Multi* = "more than one" = (aggregating two or more disciplines)

3. On a scale from 1 to 10, indicate the grade you would give, for this question, to the multidisciplinary educational approaches that you were actually offered in the field of business administration? ☐ ☐

3a. What should it be ideally? ☐ ☐

When you think of crossdisciplinarity, do you start from the relation *Cross* = "through, across" (generalizes / translates a concept, a tool or a method from one discipline into another)

4. On a scale from 1 to 10, indicate the grade you would give, for this question, to the crossdisciplinary educational approaches that you were actually offered in the field of business administration? ☐ ☐

4a. What should it be ideally? ☐ ☐

B. In this section of the questionnaire, appreciate and evaluate, according to your opinion, to what extent other classic or modern approaches co-exist in higher education, in economic studies, and especially in business administration, and, separately, some aspects and correlations regarding the future of higher education in the field of economics.

5. Evaluate, by grades from 1 to 10, the impact of inter-, trans-, cross- and multidisciplinary approaches in Romania. ☐ ☐

5a. Evaluate, by grades from 1 to 10, the impact of inter-, trans-, cross- and multidisciplinary approaches in EU. ☐ ☐

6. Mark with an "x" the main educational approach that you consider your currently need, in higher education, in the field of economics, especially in business, in Romania and EU:

6. ROMÂNIA

1. classical unidisciplinary approach	2. evolutionary / innovative approach	3. realistic /atomistic approach
4. modern inter-, trans-, cross- and multidisciplinary approach	5. excessively pragmatic approach, exclusively focused on what one can	6. approach through experiment and testing in new situations

6a. EU

1. classical unidisciplinary approach	2. evolutionary / innovative approach	3. realistic /atomistic approach
4. modern inter-, trans-, cross- and multidisciplinary approach	5. excessively pragmatic approach, exclusively focused on what one can	6. approach through experiment and testing in new situations

7. Mark with an "x" the main educational approach that you consider your students will need in future, in higher education, in the field of economics, especially in business, in Romania and EU.

7. ROMANIA

1. modern inter-, trans-, cross- and multidisciplinary approach	2. approach based on self-selection /assisted self-training	3. approach based on individualized or customized curriculum	
4. approach exclusively based on e-education	5. approaches focused on life-long learning/education	6. extra muros approach, through self-didacticism	

7a. EU

1. modern inter-, trans-, cross- and multidisciplinary approach	2. approach based on self-selection /assisted self-training	3. approach based on individualized or customized curriculum	
4. approach exclusively based on e-education	5. approaches focused on life-long learning/education	6. extra muros approach, through self-didacticism	

Number questionnaire ☐☐☐