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# Developing entrepreneurial competencies in students through constructivist education

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**Abstract:** Professional competence, as a whole, also includes the entrepreneurial field which implies, among others, innovation, planning and changing, efficient usage of the resources and development of the human networks. The purpose of this research is to highlight the role of constructivist education and the means through which it contributes to developing entrepreneurial competencies in future teachers-students. We consider that the ways of merging methods, instruments and specific entrepreneurial means can play a part in facilitating the development of entrepreneurial competencies and they present an interesting perspective to be approached.

**Keywords:** Competencies, Entrepreneurship, Constructivism, Academic Education, Initial Development

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## 1. Introduction

In the knowledge-based economy, education helps in identifying social needs and supports the acquisition and development of specific competencies. Universities are summoned to contribute to economical growth and diversification and to create an atmosphere which can answer the hyper-competitive global requests [1].

By tradition, Universities are not entrepreneurial, but they can become nurseries for new companies and for different connected activities. The highly qualified human resource that has entrepreneurial competencies able to transform the relationships between the school and the labour market represents the central point of a network that contributes to the development of a social capital for companies.

In America, entrepreneurial education has been introduced since 1947 in University (Harvard), but it did not become a force in business schools before 1970 [2].

In Germany, the relationship between University and industry is not a new phenomenon, and the influence is mutual. On one hand, companies can have access not only to top technologies but also to training students and teachers (...). On the other hand, Universities can increase their financial sources and can efficiently secure the connection with practice, valorizing the applicability of what the students learnt [3].

China and India are making substantial investments in education and professional training. In China, many Universities have their own nurseries for initiating students in entrepreneurship. As for the entrepreneurship courses, they do not catch the attention and the setting up of entrepreneurial education remains in an initial stage, with no planning or standardization [4].

Among the entrepreneurial development measures in India there is: using techniques for the refinement of entrepreneurship, selecting the right candidates, experience exchange, collaboration encouragement and research encouragement [5].

The European strategy considered for 2010-2012 regards, among others: the improvement of educational systems, greater support for young people in finding jobs, establishing connections between Universities and the business environment as well as the continuation of the Erasmus, Leonardo and Erasmus Mundus programmes [6]. Teachers are the main actors in promoting entrepreneurship among young people.

As a document of the European Commission says, the consolidation of the spirit and of the entrepreneurial competencies, represents one of the regional policy priorities, numerous countries making investments in studies and programmes, measures and implementation strategies of inserting entrepreneurial education in schools and Universities.

Even if now, there is a heterogeneous picture,

*entrepreneurial education* spread more and more in many EU countries: “experience proves that, once explained, teachers easily adopt this notion (...)” [7].

In the Romanian academic educational system, entrepreneurial education is a less systematic endeavor than in other UE countries. Entrepreneurial education is still given little attention; there is no scientific approach of the formative actions at an academic level, which makes the specific processes of the Romanian entrepreneurship not developing as it should. It was discovered that there are not enough human resources for this kind of education and underfinancing makes implementation and supporting it difficult.

## 2. Theoretical Aspects

### 2.1. The Concept of Entrepreneurship

*Entrepreneurship* is a process that requires involvement, passion and creativity, a dynamic process of vision, change and creation. Researchers in the domain are making efforts to learn more about the entire entrepreneurial process.

The term “entrepreneurship” surpasses the size or age of business (it is perceived as a kind of activity based on innovation). Entrepreneurial activities are different, according to the type of organization and the level of creativity involved.

Approaches of various specialists in economics theory give ideas that could be the basis of entrepreneurial education:

- The entrepreneur is an innovative person, a specialist in taking risks (even if the future is insecure, a right anticipation and the distinction between risk and uncertainty can help); creativity is considered to be the origin of entrepreneurship [8], [9];
- In any society, real economical problems come from unperceived opportunities (the competitive advantage is given by the development of competence which can allow the exploration and maximization of detected opportunities); corporative entrepreneurship is a sum of innovations, risks taking and the proactivity of companies on foreign markets [10], [11];
- The entrepreneurial event is shaped by social, individual and situational variables being already known that, in some circumstances and types of culture, entrepreneurial activities are more encouraged than in others [12], [13];
- Even if not uniform in time, strategic vision in entrepreneurship (perceived as a dynamic mental construction, a possible future) is translated into specific, proactive behavior, based on interactivity (more easily to conceptualize than to measure) and it also depends on the domain, the experiences of the leader [14], [15].

From an educational perspective, entrepreneurship involves a non-traditional approach towards teaching by using various methods and extracurricular activities.

As related to implementing entrepreneurship into the curriculum of teachers’ initial training (perceived as authentic social entrepreneurs), we will have to give attention to socio-educational competencies, since the social role of education is redimensioned and multifunctional connections, between school and the extended community and social environment, are being established.

### 2.2. Entrepreneurial Competencies

The development of entrepreneurship is one of the most important fields of action, identified as having an essential part in the policy of the labour market and the control of unemployment at a European and also national community level. The entrepreneurial sense refers to the capacity of a person to put his ideas into practice.

The recommendation of the European Parliament and of the Council, on 18th December 2006, that adverts to “Sense of Initiative and Entrepreneurship”, considers that entrepreneurship is one of the *eight fundamental competencies to life-long learning*, that has to be developed through education (C7: *Sense of Initiative and Entrepreneurship*) [16]. Being transferable and multifunctional, key-competencies are the ones that all individuals need, to achieve personal fulfillment and professional development, active citizenship, social inclusion and workforce development.

The general perception senses the existence of a lack that has to be eliminated (inefficient teaching methods, the lack of the practical element in entrepreneurship, insufficient involvement of businessmen, etc.), there is stress on cooperation between schools and factories, by involving the educated into projects and on developing entrepreneurial competencies in teachers [17].

Starting from the premises that Universities must integrate entrepreneurship into their curriculum by distributing the themes to different modules, programmes, interdisciplinary and/or transdisciplinary subjects, we think that developing entrepreneurial competencies in students has become a priority during the last years and it represents the main modality of connecting academic life to socio-economical and professional life. As recent research show, the students’ involvement in local projects, in a community environment must be encouraged by the academic educational system.

It becomes more and more important for students to learn and work in a community organization, to benefit from the support of the community, to learn from other people’s experience and to actively get involved [18]. We consider that the term competency is one to be improved in the future. In a narrow sense, competencies are capacities put into practice, used in various situations, in order to successfully solve different tasks, problems, in a rational and creative way.

They can also be considered as structured assemblies of knowledge and abilities acquired by learning, to which we add attitudes as traits of personality. The development of entrepreneurial competencies must be guided so that they

can answer to social and economical needs. The lack of competence should not be mistaken for other difficulties of recruitment (perceptions and attitudes towards a certain occupation, payment, hiring conditions, etc.) [19].

As for the psycho-pedagogical and methodological training of teachers, we think that there is not enough stress on the competencies that are characteristic to social entrepreneurship.

We are in favor of introducing an infused intercession of the contents which are to encourage social entrepreneurship in the initial training of teachers. These contents should be naturally introduced into the already existent curriculum but they should also allow openness to the work market. They can add up to certain social activities and projects that are suggested by young people and which regard students directly. A starting point in forming competencies is the promotion of the entrepreneurial sense [20], [21]. *The innovation implementation, the risk taking, the assumed opportunities and the proactive orientations* are all important characteristics of the social entrepreneurship (and not only), that can transform into general competencies.

They lead to a series of specific competencies that operationalize according to certain indexes, valuable for the chosen paradigm.

### 2.3. Constructivist Training

Educators are challenged to set forth the learning opportunities of the students in relation with the unstructured and uncertain nature of the entrepreneurial environment [22]. Turning into a new learning paradigm [23], constructivism is theory-centered knowledge of the learning individual.

Some research show that an action-targeted training approach, assembled in a constructivist manner, has a positive impact on the development of entrepreneurial competencies in students [24], [25]. In order to develop the expected competencies, the new training must be centered on action, on solving problem situations, on transferring elements characteristic to scientific knowledge to different contexts of social reality.

Social constructivism underlines the importance of interactions, of debates and ideas conflict. This particular thing correlates with contextual, situational learning, with valorizing the role of culture, of intercultural relations. Unlike classical instructivism, constructivism reflects centering on the inquisitive one, on the one building in an interrelation-based situation.

Bringing into discussion Snowman's and Biehler's works (2003), E. Izquierdo and D. Buyens (2008) say that the constructivist perspective can be found in two forms: the cognitive perspective (does not deny the possibility of group learning) and the social approach (does not deny the value of working independently, apart from others).

In shifting from behaviorism to constructivism, the accent from transmission curriculum passes to transactional curriculum. Constructivists suggest that learning is more efficient when a student is actively engaged into it. The

more students take over the role of self-governing, the more teachers will change role, the later becoming the student's assistant or trainer during the process of learning.

Entrepreneurship (as common place for producing knowledge) is learnt, and this can be achieved by constructivist training. Thus, we can identify the existence of some relations between entrepreneurship characteristics and aspects specific to constructivist training. Entrepreneurial behavior can be stimulated by learning, the constructivist strategies that can have positive results in forming entrepreneurial competencies (general and specific) being really valuable.

## 3. Methodology and Methods

The purpose of this research is to evaluate the impact constructivist education has in developing entrepreneurial competencies on three scales: entrepreneurial knowledge, entrepreneurial capacities and entrepreneurial attitudes.

The objectives resulted from the purpose of our research are meant to establish some directions of action, priorities we concentrated on as we intended to underline the role of entrepreneurial education into the knowledge society.

Therefore we thought about:

- Collecting data referring to entrepreneurial information which were useful to describe the horizon of the students' entrepreneurial culture;
- Using constructivist education strategies during the specific Psycho-pedagogical Training Module, to show their usefulness in developing entrepreneurial competencies in students;
- To experimentally elaborate, test and validate a Technological Model based on strategies of the constructivist education, model that should follow the development of entrepreneurial competencies.

In order to accomplish the purpose and the objectives set forth, we started from the hypothesis according to which if, in the students' initial training, we used strategies that were specific to constructivist education, then they would acquire, during this time, the entrepreneurial competencies required in the knowledge society.

Two particular hypotheses are deduced from the general hypothesis:

1. Particular hypotheses number 1: The students in their last academic year do not have attitudes and knowledge that are specific to entrepreneurial education;
2. Particular hypotheses number 2: The use of constructivist strategies will help to improve entrepreneurial knowledge, will form specific entrepreneurial skills in students and will play a part in shaping a positive attitude in relation with the entrepreneurial sense.

This way we wanted to test if the students' constructivist training was encouraging or not their entrepreneurial behavior.

We consider a teacher's training as an entrepreneur, by

stimulating the innovative capacity of transferring certain ideas into practice, of identifying alternative resources, to be very important (from extra sources of information to new methods and technology usage). The first year of the research was spent for documentation on the subject, gathering data on the level of knowledge and on the attitudes of the students in relation with the entrepreneurship field.

On the first stage we chose a number of 176 students from the Faculty of Natural Science, Mathematics-Informatics and Physics Specialties.

The experimental design took into consideration splitting the students into two groups: the experimental group (88 students) and the witness or control group (88 students). The independent variable (The Technological Model based on constructivist strategies) was implemented into the first group, students with whom we worked for the promotion of entrepreneurial education during the academic year 2012-2013.

In order to collect data on entrepreneurial information that students had, we applied a questionnaire with multiple questions, on students from both groups, choosing a quasi-experimental pattern of research. Starting from the theme of the research, from the set of hypothesis discovered during the observational stage, the indexes were selected and then translated into questions for the questionnaire.

We were interested in finding out the students' opinion about the following indexes: innovation, risk, opportunity and activism, degree of involvement in the activity. Using a set of 10 questions, we were interested in:

- Understanding the expression “entrepreneurial competencies”;
- Reasoning the necessity to include entrepreneurial competencies into the competence profile of the teacher;
- The capacity to list, at least three entrepreneurial competencies a teacher should have, regardless of specialty;
- Identifying the main actors the innovation process depended on, as part of the learning process;
- How much the students were encouraged to use the new ideas into practice;
- The capacity to describe, in short, a problem the students took risks in solving and to take the responsibility for their choice;
- The social activity they mostly preferred;
- The ability to adapt easily to new contexts or situations;
- The way they contributed to developing inter-human relationships;
- The extent they used the new informational technologies in learning.

During the second stage we focused on putting together a plan of rational organization, which could stimulate the entrepreneurial sense and help in developing competencies that were characteristic for this domain, by relating to certain contents specific to the Science of Education field.

Educational intervention consists in making a Technological model that is projected on constructivist strategies that can stimulate the plan of developing entrepreneurial competencies in students.

**Table 1.** Constructivist strategies associated to entrepreneurial competencies

General competencies	Specific competencies Aimed at indexes	Constructivist strategies used in developing entrepreneurial competencies
C1. Implementing innovations	1.1. To stimulate creativity 1.2. To use technologies 1.3. To valorize context	1. Mental construction instruments of understanding by the mental processing of information and the development of mental representations: Personal emblem, A diagram of prejudices, mistakes and confusion
C2. Risk taking	2.1. To appreciate different perspectives 2.2. To use error for the understanding process 2.3. To bear responsibility in taking decisions in different situations	2. Mental construction instruments of understanding by the abstract processing of integration and accommodation, categorization and conceptualization: The Venn diagram of comparative analysis, Conceptual map
C3. Speculating, valorizing opportunities	3.1. To give different ways of representation, perspectives on the learning content 3.2. To assure a experiential environment for learning, that can facilitate exploration with a meaning 3.3. To choose the best ways of expressing yourself	3. Mental construction instruments of understanding by formulating judgments and arguments: Consequences deduction, SWOT analysis 4. Mental construction instruments of understanding by solving problems and situations: The situation solving matrix, The task-division pyramid 5. Mental construction instruments of understanding by taking decisions: The option reasoning matrix, The diagram of relating and of organizing an option
C4. Proactive orientation	4.1. To accomplish experience exchanges 4.2. To use the internet through one's own activity	6. Mental construction instruments of understanding by evaluation and self-evaluation: Critical self-portrait, The pattern of valorizing roles

For a more detailed analyses we operationalized the indexes corresponding to specific competencies, so that they could help us evaluate the key-aspects: they adapted to

new situations, they treated information in a problematized, creative way, they selected the training routes that were based on free development, experiences, ideas, they chose

direct contact with different cases, outlined opportunities for an exploratory learning, used different negotiating and communication techniques, settled connections, created social networks, developed educational partnership, gave alternatives in solving possible problems, made projects of implementing ideas, innovations in theory and educational practice.

For more various and modern strategies, we intermingled a series of techniques, methods and active-participative procedures in the process, which should efficiently contribute to developing the competencies looked for:

- Collages;
- Case analysis;
- Video clips making;
- Visual simulation of some entrepreneurial situations;
- Making audio recordings of local entrepreneurs;
- Reading and pair summarizing, heuristic conversations and collective discussions;
- Round tables and the brainstorming method;
- The mutual teaching-learning method;
- The structured and the unstructured essay;
- The writing workshop, the reading workshop;
- Group investigation and the interview;
- Roles interpretation method; the general objective being that of improving communication with the help of different social actors (colleagues, teachers experienced in establishing partnerships with economical and business environments, school principals or factory managers, members of different organizations and humanitarian associations);
- Glogster to create virtual posters by using texts, pictures, hyperlinks.

On the third stage we tested the entrepreneurial competencies students had, by suggesting training tasks which made use of a large range of similar competencies. We asked for the development of micro-projects carried out in partnership with different educational institutes and the active involvement into creating resolutions for some problems came across during pedagogical training.

## 4. Results

The results obtained stress the idea that there was a connection between constructivist education and entrepreneurial education because constructivism, as theory of knowledge, offers a series of strategies which prove to be valuable in developing entrepreneurial competence. However, more research is required in order to establish a stronger connection among specific entrepreneurial programs and strictly academic ones, guidance towards formation, exact domain or knowledge segment specialization.

In order to test the first particular hypotheses, we processed and interpreted the answers given by the students in both groups to the questionnaire and we registered the following data:

- For the first question, 50% of the students in both

groups gave almost correct answers, most of them considering that they represent the necessary knowledge for a person to start a business (32%), to get involved into a self-helping activity or volunteership (23%), to put a new idea into practice (17%), to valorize a hobby (12%). The remaining 16% gave other different answers, insignificant for our statistics.

- For item number 2, all students gave 45% affirmative answers for the first group and 49% for the second.
- Among the most significant answers given by all the students for item number 3 there were: the capacity to put ideas into practice (34%), the capacity to plan and organize activity (26%) the knowledge and understanding challenges an employee or an organization faces (19%) and the proactive attitude (11%). The other 8% gave different answers and 2% gave no answer.
- With regard to choosing the factors that the innovation programme in the learning process depends on, the students in the first group placed teachers in first position while the students in the second group placed them on the fourth. Thus, the first group registered the following results: MEC (25%), teachers (21%), nongovernmental associations and organizations (17%), schools principals (15%), pupils/students (12%), other factors (10%). The second group obtained the following observations: schools principals (27%), MEC (24%), nongovernmental associations and organizations (16%), teachers (15%), pupils/students (10%), other factors (8%).
- For item number 5, about the proportion students were encouraged to put their ideas into practice, we obtained the following results: group 1 – 15% in a high proportion, 12% in a large proportion, 27% in a small proportion and 46 in a very small proportion; group 2 – 23% in a high proportion, 15% in a large proportion, 24% in a small proportion and 38 in a very small proportion.
- For item number 6, most students (in both groups) – more than 50% – exemplified different school situations and said that they did not get involved from their own initiative.
- As for the activity students mostly got involved in, the choices were shared as it follows: group 1 – reading (38%), sports (35%), walks outdoors (16%), volunteership (6%) and different answer (5%); group 2 – reading (29%), sports (38%), walks outdoors (18%), volunteership (9%) and different answers (6%).
- Item number 8 was about the students' adaptability to new situations. The students in group 1 responded 59% positively and the ones in group 2 in a proportion of 55%.
- Item 9, based on an open question, quantified the students' involvement in developing interpersonal relationships. Their argument was entirely motivated,

more than 50% of the students in both groups giving no reason for their answers. Most of them concentrated more on how fast and how accurate their reaction was and less on starting the action, on initiating inter-human relations, on the interest in developing the art of interpersonal relations.

- The answers for item 10, about new informational technologies in learning, show that: group 1 – 68% (high proportion) and 32% (small proportion), and group 2 – 76% (high proportion) and 24% (small proportion).

After interpreting the results of the questionnaire, we came to the following conclusion:

- In identifying and analyzing a competency, students gave more attention to knowledge and less to capacities and, especially, to attitudes. Referring particularly to entrepreneurial competencies, they almost entirely referred to specific competencies, to certain operational indexes, which suggested that the large picture of entrepreneurial competencies was not well outlined for them.
- As the answers, present in the competence picture of the teacher, favorable to entrepreneurial competencies were below 50% for both groups, we could assert that students were not fully aware of the importance of pragmatic, proactive and innovative trend of the entrepreneurial paradigm in the learning environment.
- Among the competencies the students chose and considered at the same time valuable there was the capacity to put ideas into practice and that of planning and organizing (but they did not remind the capacity of taking decisions or risks, of evaluating objectively, of adjusting according to feed-back – elements of the same importance in entrepreneurial activities).
- The students placed teachers on the second and third place, according to the importance of the factors that contributed to the innovation implementation in the learning process. This might prove a lack of trust in the teachers' ability to change or innovate, or a sad reality where the teachers were not learnt and, as a result, they did not know or they did not have the courage to implement innovation, did not have the right attitude proffering routine, classic, traditional practices. There comes the fact that The Ministry of Education and Research (MER) is in top position, which makes us think of an impercipient decentralization that, essentially, did not get to schools, teachers and students.

- We found out that students did not have any occasions that could stimulate their creativity that they were, only in a very small proportion, asked to test their ideas, suggestions and solutions into practice. That proves that students have been educated in an unstimulative environment from a competitive point of view, and this is not favorable at all to the competition they encounter in their socio-economical and professional life.
- The answers for item 6 showed lack of initiative and motivation the students had about starting actions on their own. Without having a particular interest in certain success models, without being supporting and counseled by teachers during the learning process, they did not acquire neither competencies specific to social entrepreneurship (that we were interested in at a larger extent, as we considered it characteristic to teachers) nor an attitude favorable to implementing innovations, to taking risks and to taking decisions with full responsibility.
- Wanting to find out which were the activities the students got involved into at a greater extent, we selected some of the activities with a higher frequency and we came to the conclusion that most of them read and practice sports. Unfortunately, volunteer activities did not have a special place, as they were among the last positions, only 15% of the students in both groups being aware of the importance of volunteering in forming and developing entrepreneurial competences.
- The degree of adaptability to new situations was above 50% among students in both groups, but we considered that the percentage could increase as long as they were given the methods and techniques, valuable instruments of learning from the perspective of the expected purpose (we consider the cognitive-constructivist ones to be important).
- Interpersonal relationships are of utmost importance for each of us. The fact that the students did not give arguments for their answers and insisted on the relations the others initiated prove a lack of exercise in maintaining their own ideas and their fear for possible communication failure. That is why, there should be applied modern active-participative strategies in education (we suggest the constructivist ones), that can give students the possibility to assert themselves, to get involved more and to learn how to communicate.
- The students use new educational technologies (as the percentages show). This ability must obviously be optimized as it can be improved.

*Table 2. Constructivist strategies associated to entrepreneurial competencies*

General competencies	Specific competencies	G1: 86 students		G2: 88 students		Differences between G1 and G2
		Nr	%	Nr	%	
C1.	C1.1.	76	88.37	54	61.36	+27.01
	C1.2.	64	74.41	73	82.95	-8.54
	C1.3.	85	98.83	78	88.63	+10.2
C2.	C2.1.	72	83.72	70	79.54	+4.18
	C2.2.	66	76.74	32	36.36	+40.38
	C2.3.	79	91.86	58	65.90	+25.96

General competencies	Specific competencies	G1: 86 students		G2: 88 students		Differences between G1 and G2
		Nr	%	Nr	%	
C3.	C3.1.	53	61.62	54	61.36	+0.26
	C3.2.	80	93.02	69	78.40	+14.62
	C3.3.	64	74.41	75	85.22	-10.81
C4.	C4.1.	77	89.53	48	54.54	+34.99
	C4.2.	73	84.88	81	92.04	-7.16
	C4.3.	80	93.02	82	93.18	-0.16

In order to test the second particular hypotheses, we asked both groups to elaborate micro-projects (individually or as a team) targeting the students' involvement in changing the organizational culture of the pupils in pedagogical training classes, the development of relations based on negotiation and/or partnership with the pupils or tutors, mentors, the improvement of a training situation often encountered in pedagogical training.

Unlike the activity developed with group number 2 students (the control or witness group), with whom we worked in a traditional manner, the activity developed in group 1 (the experimental group) was thought of from the perspective of forming entrepreneurial competencies by constructivist training. Thus, we implemented the projected Technological Model into the experimental group and we compared the indexes of the specific competencies previously mentioned and described, by accomplishing the operational objectives. For a most exact radiography of the situation, we compared the results of both groups (for the pedagogical training lessons and for the accomplishing of their projects) all through the second semester of the academic year 2012-2013.

We must mention that two students from the experimental group left during the program, but it did not disturb its development in the best conditions of pedagogical training and it did not influence the final results of the investigation either. In processing the data we also considered the registrations from the evaluation tests during the pedagogical practice and the points after the evaluation of the projects.

As related to the values acquired, we decided to demonstrate the difference between the results of the experimental sample, after the post-test, and the results of the witness sample.

*Innovating implementation:* stimulating creativity, using technologies, valorizing the content and the products of learning

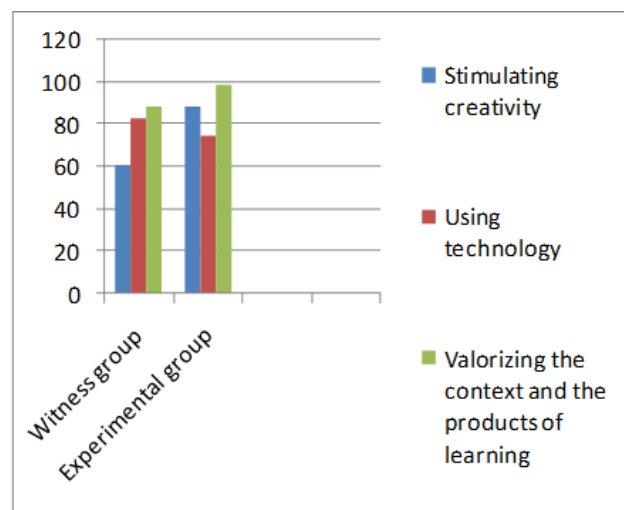


Figure 1. Percentage data resulted from the competency C1 items

*Risk taking:* considering perspectives, using errors for the understanding process, assuming responsibilities in taking decisions in different situations

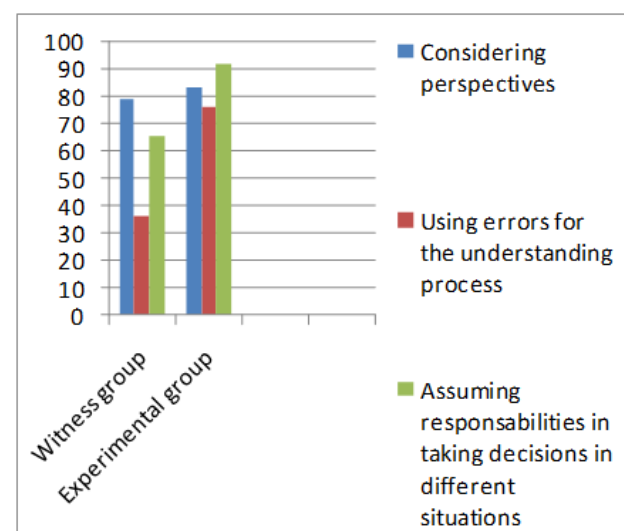


Figure 2. Percentage data resulted from the competency C2 items

*Speculating, valorizing opportunities:* giving different representations and perspectives on the content of learning, assuring an experiential environment for learning, choosing the best ways of learning



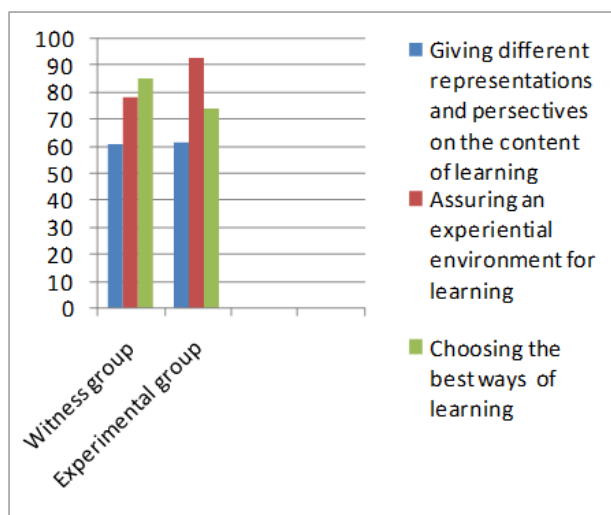


Figure 3. Percentage data resulted from the competency C3 items

*Proactive orientation:* making experience exchanges, using the internet for one's own activity, making entrepreneurial micro-projects

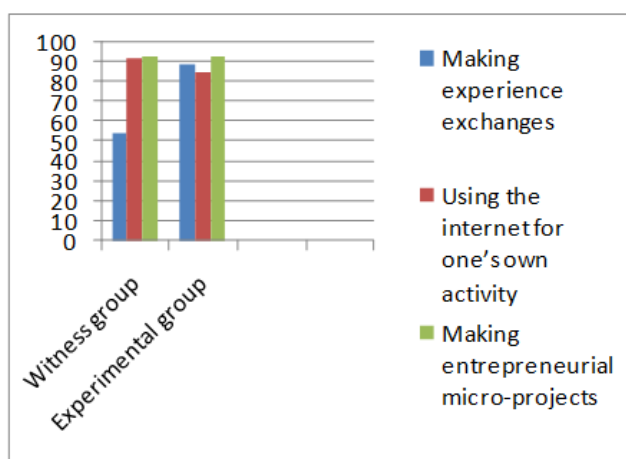


Figure 4. Percentage data resulted from the competency C4 items

## 5. Discussion

The interpretation of the statistic results corresponding to the testing of particular hypotheses number 2 led us to the following considerations:

1. Creativity stimulation makes a necessary condition in forming students from the perspective of innovation implementation. Constructivist training uses methods and techniques of developing the creative potential each young man has, placed on a certain step in his evolution. The difference, of more than 25% between the results of the experimental group and the witness group, confirms the efficiency of these methods that we reminded and used in the suggested Technological Model.
2. The very similar results of the students in both groups, on the item that refers to using technology, can be explained by means of the students' interest in using

computers. They were mostly attracted by the advantages of the new informational technologies and the development of computers network as well as by the possibility to access and use the internet for educational reasons during didactic activities. All these come to support students in the process of their training, from an entrepreneurial perspective.

3. For the valorization of the context, the students in the experimental group identified possibilities of developing the environment specific to learning and they also approached different ways of combination (in theory and in practice) of the products of their own activity, as a result of situational learning.
4. Being perceived from different perspectives, the experimental group registered 4.18 percents more, fact that made us consider the constructivist process to be important from the perspective of presenting educational situations from different angles. We appreciated the formulation of exploratory questions and the transfer of ideas in larger contexts more than anything.
5. The students in the experimental group scored significantly higher scores comparing to the other students, for the item that regarded using error to simplify understanding. The difference of more than 40% signaled the importance of assuming errors, of analyzing them from a constructivist point of view and the acknowledgement of their own learning difficulties.
6. Referring to assuming responsibility in taking decisions in different situations (certain, uncertain, risky), the students in the experimental group reached a significantly higher score (more than 25%). Without learning how to take risks, but also be responsible for the implications of their decisions, young people would never have any initiative during their didactic career and would be faced to difficulties in the process of development, innovation in theory and educational practice. That is why we believe that the constructivist instruments we used proved to be useful in developing this particular competency in students.
7. The very small difference in percentage, insignificant as statistic, associated to the learning contents, proves how easily young people adapt to different perspectives and use, during learning, multiple ways of stocking, processing, transferring, analysis, synthesis and evaluation of information.
8. The impact that the use of constructivist instruments had during didactic activities (courses and seminars) was of a significant importance because the students we worked with in a constructivist manner valorized the aspects of experiential learning in pedagogical training, in a better way. By the working tasks they projected, students used, at a greater extent, (93.02%) their previous experience.
9. There were no high scores for the item referring to the ways of communication with pupils, which suggested



us that there should be more stress on expressing ideas, on explaining choices. It is essential for students to be encouraged to present their own ideas, to present in a critical manner certain situations, to exercise how to adapt their message to the specific of the receiver (age, gender, profession, affiliation, level of culture, etc.)

10. The difference of more than 30% the students in the experimental group scored compared to the students in the control group showed the positive influence constructivist instruments had, in combination with the methods and active-participative techniques, in accomplishing experience exchange. In the proactive orientation, a competency specific to entrepreneurs, learning from other people's experience proved to be at least as valuable as learning from one's own experience.
11. Even if the students in the witness group got a higher score for the item of using the internet in their own activity (to create a Web, conceptual maps, to project trial lessons, presentations in front of an audience), the score difference was not significant. As scores for both groups are higher than 80%, we can assert that students know the valences of computer-assisted training, they have the capacity of accessing and using certain programmes and web-sites and the attitude is a positive one. Together with the development of Internet, there appeared connected activities (e.g. e-learning, e-commerce) that students successfully access.
12. The students got actively involved in accomplishing the practical tasks, in almost 100 percentage (the witness group: 93.18% and the experimental group: 93.02%). The micro-projects of the students (even if not all of them of high quality) represented a starting point in the process of training students into future teachers, during their initial training from an entrepreneurial perspective.

The data we obtained confirm the hypotheses of our research, an ameliorative one with an experimental character. Results indicate that an action-oriented instructional approach fitting into the constructivist view, has a positive impact on the development of entrepreneurial competencies in undergraduate students.

## 6. Conclusions

The results of the research indicate that there are many obstacles but also solutions that come under the existence of joint vision that starts from the need for entrepreneurial education, even in non-business Faculties.

By projecting a constructivist-like process we simplify and help the implementation of the entrepreneurial sense in Universities, as the conclusion we have drawn show, after working with Level I students, year 3 from the Faculty of Exact Sciences.

Guiding education from an entrepreneurial perspective is not so easy to implement and, in consequence, not very

observable, because there is no corresponding strategy. We have chosen the infusion process, giving the specific contents of Class Management an entrepreneurial approach. With their help, students got involved more actively in their own training process, they became more responsible and decided to self-govern, they had more initiative during pedagogical training and they also came with new ideas that were later used in practice. The essence of entrepreneurship surpasses the pragmatic and economically opportunist activity and becomes a new vision, where each social actor has its own place. We recommend teachers to become aware of the roles they play and imagine themselves as social entrepreneurs who build alternative ways of life and profession.

Our opinion is that Universities can promote entrepreneurial talent and, especially, develop entrepreneurial competencies. By creating an image, a "university branding" they can contribute to bonding the relationship between the academic life and the social life of the community.

Universities (as pluralist organizations) can keep their vision, but they can become more flexible as Department activity, as complementary structures, the way teachers and students set themselves in relation to their specific activities.

The insertion of entrepreneurial values can change some aspects at the level of Departments that is in charge with the initial training of teachers, a key task being finding out and encouraging people able to infer, identify and valorize innovation.

During the last years, traditional Universities tried to extend their performance borders, to have a better connection with the labour market. A good image of the University will automatically lead to attracting more students, to more projects and exchanges and, at the same time, better financing. Entrepreneurial education can form new professional techniques, competencies that allow students to act in the future as contractors, employees or entrepreneurs.

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