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Socializing entrepreneurship

B. Apolloni[a], G. Galliani[a], C. Zizzo[a], F. Epifania[a], L. Crosta[b], I. Cesareo[b]

[a]Dept. of Computer Science, University of Milano, Milano, Italy
[b] Ark Management Consulting,Italy,

Abstract

This paper discusses a statistical analysis emerging in the field entrepreneurship education, as a result of a survey conducted in the frame of the European Project NETT (Networked Entrepreneurship Training of Teachers, http://nett-project.eu).

The analysis concerns both the quality of data and the emergence of some special patterns denoting some interesting features of the entrepreneurship perception and its teaching. In the authors' intention this note should constitute a simple, yet concrete, tool to foster a scientific discussion on a discipline that is deeply rooted on knowledge management and represents a strategic lane in the improvement of modern societies.

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1. Introduction

In the lack of a strong political deal delineating a feasible feature of the modern society, entrepreneurship is going to play a backup solution of the society illness [6]. People identify exciting businesses that may represent the seeds of modern enterprises which, in turn, may constitute the real spring of the community life at various scales. In spite of the large potentiality of this new deal and of undoubtedly successful instances, young generations are not prepared to this challenge, since older ones did not elaborate a supporting cultural tissue. Hence there is a birth of many initiatives promoting the entrepreneurship education, that are supported by both private companies and public bodies such as state ministries and European Community directorates. *Demographic groups that are underrepresented within the entrepreneurial population and especially founders of startups are young people, women, disabled and/or migrants. Europe has to open up for them paths into entrepreneurship to create for them jobs, empower them economically and socially and leverage their creative and innovative capacities. These paths should be sensitive to the needs of different groups, their expectations and their norms with regards to how advice and information is delivered and received. Actions should be based on an integrated support scheme that promotes human capital, as well as providing financial support. Besides specific activities adapted to the needs of each of these groups, they should all be included into entrepreneurship training programs that are designed and offered in partnership with education and training providers, youth organizations, mainstream business advisers and financial institutions.* [5]

In this line, NETT is a project financed by European Commission, Enterprise & Industries DG with the aim of gathering a Networked Social Community of teachers to improve the entrepreneurship teaching in the European educational system. As a basic step, an Internet open platform will be set up in the cloud for exchanging contents, tools and methods between (actual or prospective) entrepreneurship teachers. The platform will support, with the most advanced technologies, an international social community where people involved in entrepreneurship education will debate on this topic and find concrete helps for realizing an European way of training young people to become entrepreneurs, yet in respect of local industrial and commercial

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*Corresponding author. Tel.: +39-02-50316284 ; fax: +39-02-50316228.
E-mail address: apolloni@di.unimi.it.
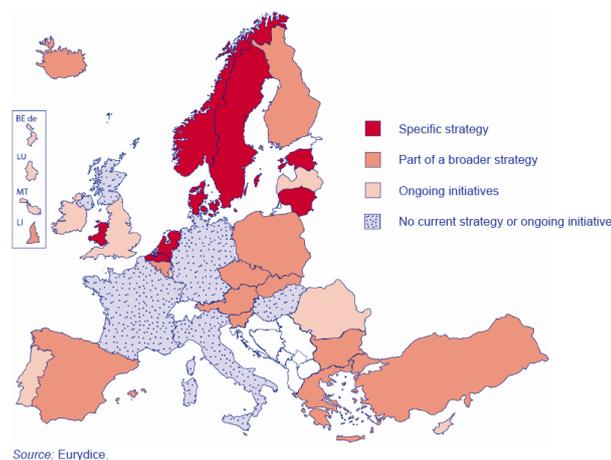
Source: Eurydice.

Fig. 1. European strategies to teach entrepreneurship.

frameworks. To ensure a high level of pervasiveness, in accordance with the Bologna Process [8] , the platform will give teachers and trainers appropriate knowledge, skills, networking opportunities, tools, strategies, innovative and practice-based methods necessary to teach entrepreneurship effectively by matching skills needed towards specific training and teaching techniques. This goal is pursued by giving teachers the opportunity to share experiences supporting their peers with technical training, but also entrepreneurship theory and practical examples deriving from mutual and practical experience. Furthermore, the platform will benefit from the members examples and experiences on entrepreneurship education, aimed to integrate and build an online community of professionals developing high quality online accessible resources, teaching methods, concepts and entrepreneurial training programs.

A first step to realize this platform is a quantitative small scale survey to collect and analyse the training needs of primary and secondary school teachers together with some university and vocational education teachers and to capture the initial understanding of specific countries [7]. In the next sections we will discuss the results of this survey as it has been carried out in the Milano area (in Italy).

2. The Italian survey

Inside the Europe map shown in Fig. 1 which characterizes the states with respect the national/regional strategies and initiatives to the implementation of entrepreneurship education into general education in the period 2011/12, Italy appears among the *null strategies* countries. Still worse, neither national objectives related to entrepreneurship education can be found in national lifelong learning strategies as well as in general education and youth strategies which generally include a key competences approach [4].

However, economic growth strategies often embrace entrepreneurship education. This entails that regional programs financially promote educational initiatives toward entrepreneurship (see for instance [9]) and ancillary actions, such as the IFS portal [2] created by the Italian Education Ministry to introduce students in the entrepreneurial world through a guided simulation of the main entrepreneurial activities. In summary, common people, students and teachers perceive the importance of this discipline both as relevant components of a complete curriculum of a student and as valuable promoter of the future activities the young generation are going to carry out. In order to have a blow up on this scenario, a questionnaire has been submitted to 31 people teaching in different contexts, as for school type, teaching subject and experience. People were well balanced, as for gender, instruction and teaching experience. The aims of the survey were:

1. To get a deeper understanding of the training needs of primary and secondary school teachers together with some university and vocational education teachers in entrepreneurship education.
2. To collect and analyze the training needs of primary and secondary school teachers together with some university and vocational education teachers in the specific area of entrepreneurship in Italy.
3. To identify the most appropriate active learning methods which can be applied for effective and efficient of entrepreneurship education.

We decided using the same form for all interviewees, independently of their specific teaching fields and aims. On the one hand, this decision penalizes the depth of some queries; on the other one the uniqueness of the source allows for drawing statistical conclusions in spite of the short number of answers. Therefore a set of 18 question has been formulated in order to jointly answer to the following questions:

	Skill / Capability	The importance of the skill for the entrepreneurship	Would this skill should be a part of learning process in entrepreneurship	How prepared are you for teaching this topic	Would you need to improve the knowledge and skill to teach it
1.	**Entrepreneurial**				
2.	Entrepreneurial Traits/Behaviors				
3.	Leadership				
4.	Personal Assessment				
5.	Personal Management				
6.	innovative thinking				
7.	creativity				
8.	ability to see opportunities				
9.	**The basic business knowledge and skills**				
10.	Business Concepts				
11.	Decision Making				
12.	**Communications and Interpersonal Skills**				
13.	Ethics in Communication				
14.	Group Working Relationships				
15.	Dealing with Conflict				
16.	team working				
17.	**Economics**				
18.	Financial Literacy				
19.	Money Basics				
20.	Personal Money Management				
21.	Accounting				
22.	**Professional Development Career Planning**				
23.	....				

Fig. 2. The first 23 lines of the question 15 query table.

1. What are the demographic data of teachers participating in research (age, sex, education level, teaching experience, school type, teaching subject, besides name and e-mail address) (questions 1 to 8)
2. What do teachers think of their competences on entrepreneurship education and his possible improvement (questions 9 to 14 requiring marking a score from 1 to 5, where question 14 splits into 4 queries).
3. A two way table where on the row are listed Skills / Capabilities which are questioned along the columns with respects 4 aspects (question 15):
   (a) The importance of the skill for the entrepreneurship [1]
   (b) Would this skill should be a part of learning process in entrepreneurship?
   (c) How prepared are you for teaching this topic?
   (d) Would you need to improve the knowledge and skill to teach it?

   See Fig. 2. In synthesis, the first two points refer to the perceptions that interviewees have about the skills required for teaching entrepreneurship, while the remaining two points relate to the perceptions that interviewees have about the need of being trained on those skills, and their capability of using them. There are 53 queries in the list, which may be gathered in 5 almost equally populated clusters: 1. management skill; 2. economic skill; 3. communication capabilities; 4. personal initiative; 5. technical skills. Each cell of the table has to be scored according to a 5 points Likert Scale that provides an evaluation from 1 (less important) to 5 (very important) with a neutral value of 3 in between.
4. Didactic versant, split in two family of questions: the one concerning the education curricula of future entrepreneurship (question 17), the latter the didactic tools (question 18), to be filled up only by teachers on entrepreneurship education (question 16). Each family list 10 questions requiring a 5 level evaluation.

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[1]with the term *skills* in the questionnaire we refer to all the capabilities people think could be useful to entrepreneurial activities; thus it depends on the category of entrepreneurs (chemical skills, or computer skill, etc). See the above discussion on the option for a unique questions' form.
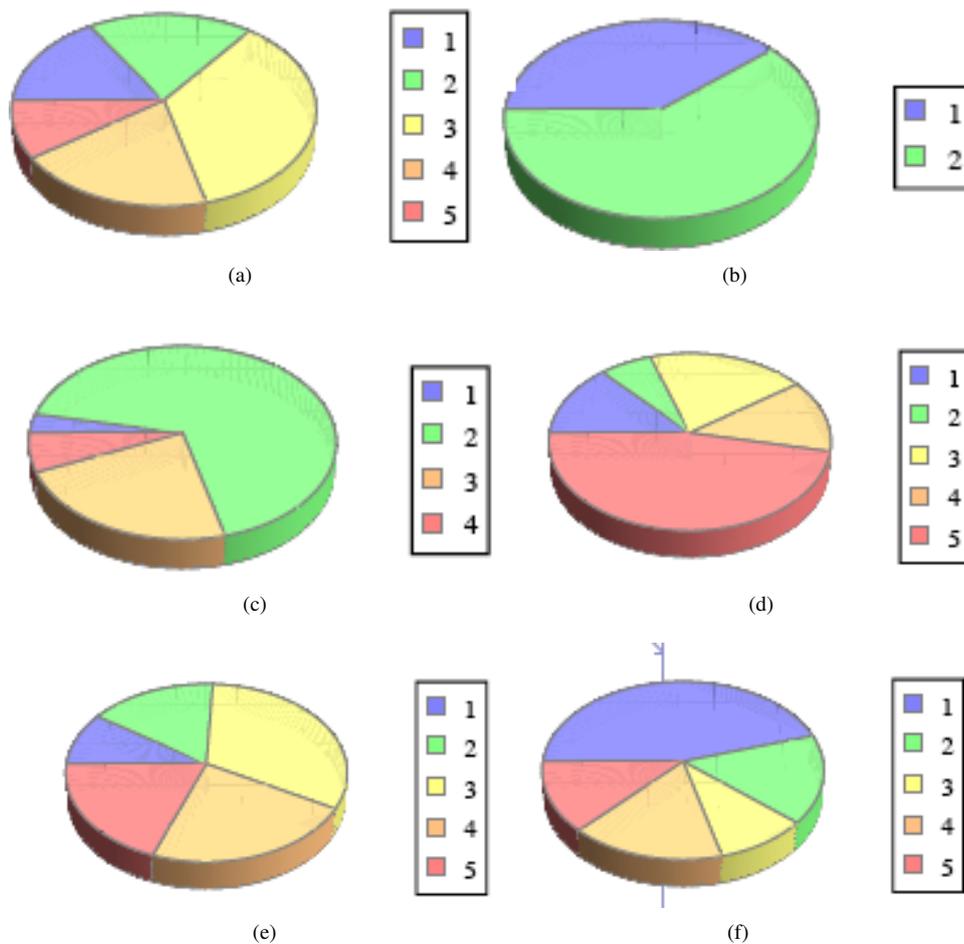
Fig. 3. A synopsis of inquired people. a. quantized age (Ceiling[(age-25)/10)];b. gender:1→ male, 2→ female;c. instruction level; d. teaching experience in years ×4 ;e. teaching grade level (c.,d., e.: same scales as in the on-line questionnaire);f. teaching field:1 → humanities, 2 → technological, 3 → informatics, 4 → others, 5 → entrepreneurship

The questionnaire is available on line at the URL:`http://shannon.laren.dsi.unimi.it/questionnaire/register.php`; it requires accreditation to access. In the following subsections we will examine the results of this inquiry from two perspectives: the quality of data and the emerging patterns.

3. Inquired people description

The people distribution is shown in the six pie charts in Fig. 3.

From these pictures we may conclude that people are: 1) well balanced as for gender, age and teaching grade level where they teach; 2) mostly bachelor graduated or higher, and 3) with a long teaching experience, 4) peculiarly, as for the teaching filed, most are involved in humanities, but all remaining fields are well represented. Of course, 31 is a very small number, however the relatively large standard deviation of the data (1.29 averaged on the questions) says that we span a meaningful sample.

4. Overall trends and quality of the data

As predictable, the score histogram is strongly biased by the highest values. This is true both for the general questions (up to question15), and for the professional ones as well (questions 17 and 18), see Fig. 4

Focusing on the first category of queries – namely 221 queries: the 53×4ones of table question 15 plus 9 queries in questions 9 to 14, if we look at the single answers we see an enough variegated spectrum of marks (see Fig. 5). Namely, each bar reports the mean score attributed by people, where some particularly low values will be discussed later.
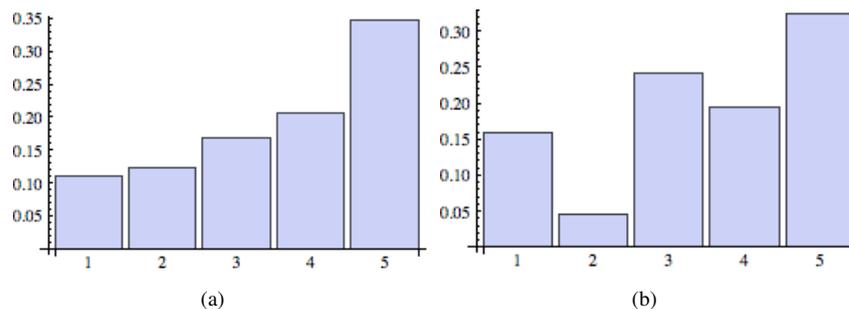
(a)   (b)

Fig. 4. Histograms of the scores assigned to (a) the general queries of question 15 answers and (b) the queries for specifically experienced teachers (questions 17 and 18)(b)
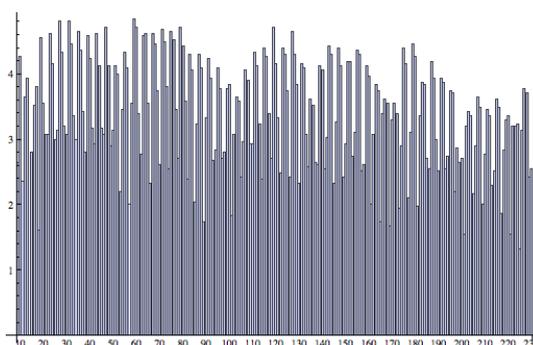

Fig. 5. Barchart of the mean scores assigned to the single (220) general queries

4.1. General skills' appreciation

Looking at the mean score per each item of question15 (i.e. grouping the score of the 4 questions heading the columns), as reported in Fig. 6(a) we may perceive some either tiring effect on the part of the interviewed people or their willing of issuing more discriminant judgments, which reflects in a decreasing trend with the questioning progress. This is accompanied by a complementary increase of the standard deviation (see Fig. 6(b)).

Vice-versa, if we gather the queries per column, we obtain the graph in Fig. 7, which confirm the score bias when we refer to the importance of a skill and the willing of teaching it to candidate entrepreneurs, while the teacher preparation and the willingness of improve his preparation on a given skill deserve substantially a uniform assignment of scores.

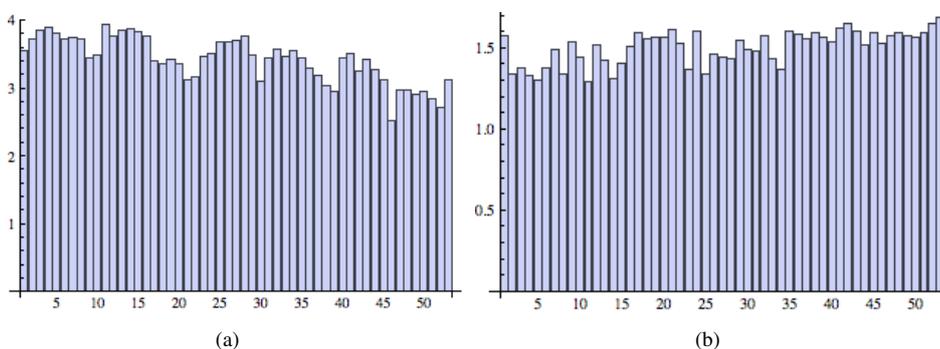(a)   (b)

Fig. 6. Average and standard deviation of scores per row items (53) in question 15.
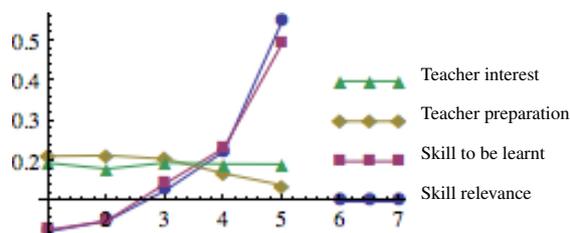
Fig. 7. Score frequency distribution on skills' consideration. X-axis: scores (from 1 to 5, scores 6 and 7 are dummy); Y-axis: score frequencies within question 15. Curve labels: column heads in question 15.
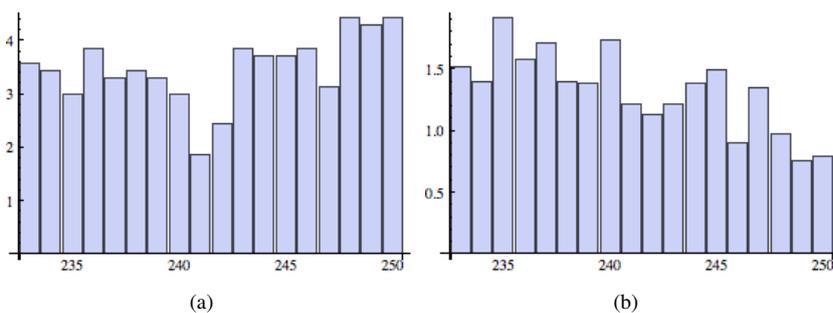

Fig. 8. Average and standard deviation of scores per queries in questions 17 and 18.

4.2. The answers of teachers on the field

As for the more professional questions (17 and 18) the analogous graphs denote more articulated verdicts with a standard deviation decreasing with time (see Fig. 8).

4.3. Looking at the overall attitude of single people

Shifting our perspective on inquired people, Fig. 9(a) shows a rather variegate approach to the questionnaire. In particular Fig. 9(b) lists the features of those scoring less, in average, the questions (namely average less than 2.9). It emerges that all them are over 45 old, while variously distributed as for the remaining features.

5. Particular trends

We have 31 persons filling up the first part of the questionnaire and 7 person completing the second part as well. Hence we cannot expect strong features emerging.

age	gender	edlev	exper	sclev	field
69	1	3	3	5	3
52	2	3	5	3	2
47	2	2	5	4	1
45	1	2	4	3	4
62	2	2	5	2	1
52	1	4	5	5	5

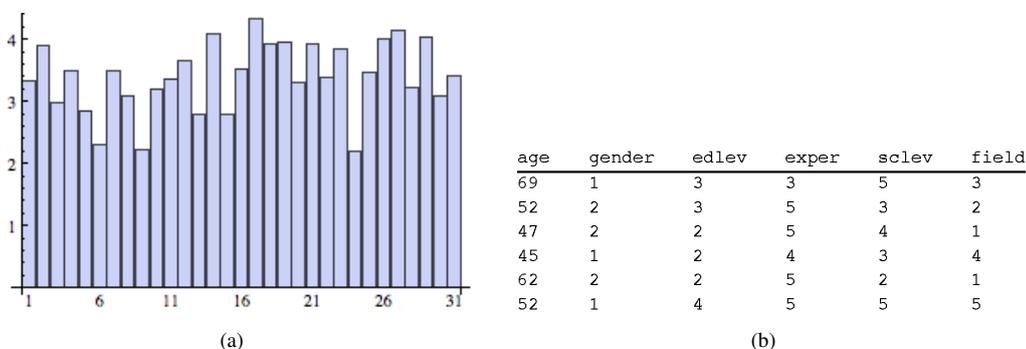(a)   (b)

Fig. 9. An overview on people filling up the forms. (a) barchart of the mean score for each people; (b) features of the 6 less scoring (in average) people.
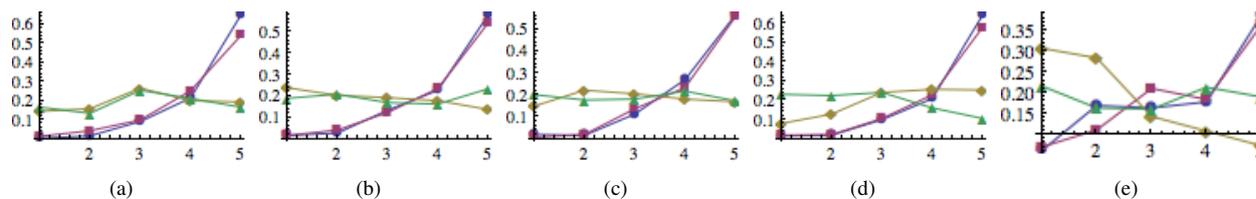
Fig. 10. Score frequency distribution on skills' consideration, split by categories: (a) management skill, (b) economic skill, (c) communication capabilities, (d) personal initiative, (e) technical skills. Same notation as in Fig. 7

	c1	c2	c3	c4
c1	1.	0.752632	0.310484	0.344696
c2	0.752632	1.	0.248107	0.430148
c3	0.310484	0.248107	1.	−0.256919
c4	0.344696	0.430148	−0.256919	1.

(a)

	c1	c2	c3	c4
c1	1.	0.91442	0.420008	0.40007
c2	0.91442	1.	0.428169	0.452145
c3	0.420008	0.428169	1.	−0.127661
c4	0.40007	0.452145	−0.127661	1.

(b)

Fig. 11. Correlation table between the four columns in the query table of question 15. (a): all data; (b): referred to the sole category 5

In particular, as for the 7 responses, the average mark on items from 233 to 241 (concerning what is really teached) we observe no particularly enthusiastic answers, with a minimum concerning the amount of time dedicated to teaching entrepreneurship and the attention to the business plan. The most scored answer is rather a wish that the teaching activities promote entrepreneurship willing of the students. Answers to question 18 items promote the usage of role games and simulation in general while distrust in the teacher centrality.

As for the most populated answers (question 15), the general trend seems following the importance with which the question lines have been allocated in the form (from the most relevance to the less one). Thus, management issues and instrumental issues (computer and electronic tools) prove less appealing than the human management aspects (actually the most easy ones, those no requiring rigorous education, probably). Per se, the general voices (queries 42 and 45) are well scored, a less benevolent fate they is obtained by the single specifications of these voices, with a definitely bad score for the ability to draw picture with computer and reckoning abilities, but also to the capability of managing the day-per-day operations. As it emerges from Fig. 9(b), the most severe verdicts come from aged people, even though the low value of the correlation coefficient between mean score per person and its age (only −0.0573227) denotes a scarce significance of this trend.

Deepening the analysis w.r.t. the five categories: management skill, economic skill, communication capabilities, personal initiative, technical skills, we observe that the general trend: high score for relevance of the skill both in the entrepreneurship and its education, almost uniform score for preparation degree and improvement willing (with a slight bias toward low values in the latter), is maintained in all categories, with the mentioned general bias toward low scores in the last category (see Fig. 10). Focusing on the full score 5, we see that it is attributed to the skill importance with a decreasing rate moving from more humanistic to more technical skills. The personal implications, in terms of what teacher already knows and what want to improve, is almost the same along the categories, apart the fifth one. In essence, interviewees denote the same picture as for the management, economic and communication skills (apart the mentioned decreasing of the full rank rate). The category "personal initiative" is similar but with an obvious decrease of willing of improving willingness (as for the initiative, either you own it on not). Finally, as for the technical skills there is a general lack of confidence of the interviewee with the technical tools, not adequately paired, however, with a willingness of recovering this drawback. Namely the correlation table between the four answers to each query is the one reported in Fig. 11(a). While in Fig. 11(b) the analysis is specialized on category 5. Thus we may see that, on the one hand correlation between columns 3 and 4 are the sole negative one, and that their value in case of category 5 are relatively low in absolute value (actually the lowest among the categories).

Coming back to the first questions to interviewees, Fig. 12 denotes that:

- the importance of student entrepreneurship education is high but not uniformly maximal (average 4.26 over 5)
- the willing of developing competence in entrepreneurship is neutral (average 2.65 over 5), though the perception of benefiting of web teaching within an international community is higher (average 3.79 over 5)
- where the best evaluated sharing opportunity within a web community is represented by the best practices (average 3.80 over 5) and teaching material in general (average 3.51 over 5).
- question 14 has not be evaluated *per se* (score 0) since scores have been attributed to the queries 15 to 18 into which it splits.

where all these evaluations are expressed with similar standard deviation.
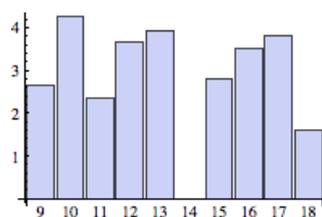
Fig. 12.   Scoring (in average) the favor of the teachers toward entrepreneurship education.

6. Conclusions

Entrepreneurship is a people capability which has not uniquely coded by a well assessed discipline. For instance, the definition of entrepreneurship education emerging in [1] is the following: "All activities aiming to foster entrepreneurial mindsets, attitudes and skills and covering a range of aspects: such as idea generation, start-up, growth and innovation". In another document, the European Commission highlights that: "Entrepreneurship education should not be confused with general business or economic studies, as its goal is to promote creativity, innovation and self-employment" [3]. Actually, our questionnaire complies with the list of skills assumed to be necessary in this document. However, the interviewees answers denote different appreciations of these skills and the way of teaching pupils them. Thus, apart from some habit notations, as a results of this survey we may quote a rather *humanistic* vision of entrepreneurship which privileges some rather *natural* people attitudes, such as initiative and communication capabilities, in diminution of technical skills – ranging from reckoning to computing technologies – requiring a deeper discipline which, in turn, at moment is lacking a well assessed framework. On the one hand this trend is not unexpected. Vice-versa it is compliant with the current European way of life. On the other one the reduction of the vagueness of the above framework we assume to go at the same pace of the improvement of the theoretical approaches to deal with fuzziness in sciences. The platform in the core of the NETT project should contribute to this progress in the general thread of modern social network emerging functionalities, namely by collecting real life didactic instances and fuzzy feedbacks on their solutions on the part of the social community members. The results of the discussed survey push us to stress the technical aspects of the entrepreneurship success story, however in a way that may prove compliant with the more soft expectations of the project target people. In short, we cannot expect to formalize a recipe for the entrepreneurship success; we will work to render the success more probable and reliable through dray statistics on the success story and their operational interpretation.

References

[1] Entrepreneurship education in europe: Trends and challenges. In *Innovation and Entrepreneurship: Good Practice Whorkshop*, page 3, 2009.
[2] AS-MIUR. Impresa Formativa Simulata network, 2010. URL `htp://www.ifsnetwork.it/portale_ifs/content/index.php?action=read_clean&id_cnt=6239`.
[3] EUROPEAN COMMISSION ENTERPRISE and INDUSTRY DIRECTORATE-GENERAL. ENTREPRENEURSHIP IN VOCATIONAL EDUCATION AND TRAINING FINAL REPORT OF THE EXPERT GROUP, Promotion of SME competitiveness Entrepreneurship, 209. URL `http://ec.europa.eu/enterprise/policies/sme/files/smes/vocational/entr_voca_en.pdf`.
[4] Eurydice. Entrepreneurship Education at School in Europe National Strategies, Curricula and Learning Outcomes, 2012. URL `http://eacea.ec.europa.eu/education/Eurydice/documents/thematic_reports/135EN.pdf`.
[5] U. Gejel. ENTREPRENEURSHIP 2020 Reigniting the entrepreneurial spirit in Europe, 2013. URL `http://www.eesc.europa.eu/?i=portal.en.int-opinions.25759`.
[6] B. Nilsson. Entrepreneurship education - does it matter? *International Journal of Business and Management*, 7:2855–2867, 2012.
[7] S. O. Sihombing. Comparing entrepreneurship intention: A multigroup structural equation modeling approach. *International Research Journal of Business Studies*, 5:57–71, 2012.
[8] European Commission Education & training Higher education. The Bologna Process - Towards the European Higher Education Area, 2012. URL `http://ec.europa.eu/education/higher-education/bologna_en.htm`.
[9] Padua University. JEst, junior enterprise, 2010. URL `http://www.jest.it/jest4/index.php`.