

# Entrepreneurial Predisposition and Intention of Students from the IFRN – Mossoró, Brazil

Giovane Gurgel, Cristina S. Rodrigues, Filipa D. Vieira

**Abstract**—IFRN – Mossoró is a Brazilian technical education institute that develops several activities to encourage entrepreneurship, such as a curricular discipline about enterprise management and the existence of a business incubator. Despite efforts, the business incubator does not produce the expected effects. Therefore, what predisposes students to start their own business? If literature review explores determinant factors like the family and personal characteristics, it can be sustained that entrepreneurship skills can be taught since primary level, until university level. This paper presents the results of research project “Empreende IFRN” to understand the entrepreneurial predisposition and intention of the students from technical level courses. Data from 365 students from technical level courses reveal an increased entrepreneurial intention of students during time (from a 2 years period to someday in the future). The entrepreneurial behavior of parents affects students’ perception about starting their own business. Students also present a cautious behavior, preferring bank deposit and investment fund instead starting a business.

**Keywords**—Brazil, Entrepreneurial intention, Entrepreneurship, Secondary technical students.

## I. INTRODUCTION

THE entrepreneurship is the creation of a new business, such as self-employment or in developing new opportunities for existing organizations or companies. For contributing to the creation of a dynamic entrepreneurial culture, where companies seek to advance in the value chain, in a global economic environment, entrepreneurship is at the center of economic and industrial policy [1].

In addition to the effect on individual initiative, entrepreneurial vision provided to students helps them when graduate to occupying vacancies in established companies. In fact, the innovation generated by professional with skills in entrepreneurship makes the company more competitive in the market [2].

The theme of entrepreneurship has been in prominent place on the political agenda of many countries. If by one side it is recognized its value and desirability to promote the economy, on the other hand the definition of incentive policies often do not produce the expected effects. Therefore, what predisposes

G. Gurgel. is with the IFRN, Rua Raimundo Firmino de Oliveira, 400 - Conj. Ulrick Graff - Mossoró-RN, Brasil (corresponding author phone: +55 84 3422-2652; e-mail: [giovane.gurgel@ifrn.edu.br](mailto:giovane.gurgel@ifrn.edu.br)).

C.S. Rodrigues is with the University of Minho, Department of Production and Systems, Campus de Gualtar, 4710-057 Braga, Portugal (e-mail: [crodrigues@dps.uminho.pt](mailto:crodrigues@dps.uminho.pt)).

F.D. Vieira. is with the University of Minho, Department of Production and Systems, Campus de Azurem, 4800-058 Guimarães, Portugal (e-mail: [filipadv@dps.uminho.pt](mailto:filipadv@dps.uminho.pt)).

someone to start your own business?

Factors such as family, education and culture positively influence entrepreneurial intention. Assuming adolescence as one of the decisive moments for a young person in his entrepreneurial career, assessing predisposition and entrepreneurial intention of students is an important activity for an educational institution in order to enhance the entrepreneurial skills of its students.

The Federal Institute of Education, Science and Technology of Rio Grande do Norte (IFRN) - Campus of Mossoró is a Brazilian institution of technical education which has 50% of its offer for young people seeking education at secondary level and/or technological. The IFRN of Mossoró has a business incubator that seeks to encourage and support entrepreneurial initiatives of its students but has been experiencing low demand from it.

In this context, this research work aims to understand the predisposition and entrepreneurial intention of students from IFRN of Mossoró.

The article is organized into five sections, besides the introduction. Next section briefly examines the importance of education in promoting entrepreneurship intention. Section III gives a brief review of the IFRN. Section IV presents the results of the study designed to understand the entrepreneurial intentions of these Brazilian students. The main conclusions are summarized in the last section.

## II. ENTREPRENEURSHIP INTENTION

A relevant question in the literature is the discussion of predisposition to entrepreneurship: What determines an entrepreneur? The family example? The personal characteristics? The context where he was educated? For the identification and study of explanatory factors for entrepreneurial behavior, the characteristics of the individual, and the existence of market opportunity and technology, are presented as the most significant. Previous studies have shown that the profile of the entrepreneur depends primarily on motivational factors, with emphasis on the personal fulfillment, the potential of new technologies, the business opportunity and the desire for independence. However, there are other psychological factors that must also be taken into account, some with greater impact than others, notably the need for achievement, the self- efficacy, the propensity to innovate, the ability to share, the leadership, the confidence, the risk-taking, the ability to make decisions, the humility and the ability to make sacrifices.

Entrepreneurial intention was already present in the

definition of entrepreneurship cited in [3] when launching the two meanings for the term: alertness to new opportunities and actions arising after the discovery of an opportunity. Be pursuing or exercising their creativity by creating new opportunities, or leaving for action, the full exercise of entrepreneurship is required for intention to undertake.

The entrepreneurial process adopted by research Global Entrepreneurship Monitor (GEM) considers four different stages: entrepreneurial potential, intentions, springs, new and established [4]. The GEM research focus is the early entrepreneur (leading businesses with less than 42 months).

Many researchers have studied entrepreneurship including the identification and study of explanatory factors for entrepreneurial behavior. In the literature of psychology, it has been demonstrated the explanatory power of intention as an important predictor of behavior. Understanding the formation of intention to undertake is important for the comprehension of entrepreneurial behavior. Entrepreneurial intention can be seen as a precise predictor of planned behavior towards starting a new business.

The main theories of entrepreneurial intentions were addressed during the 80s and 90s. In 80 years the emphasis was the Entrepreneurial Event Model (EE). Already in the 90s emerged several theories including the Theory of Planned Behavior (TPB), the Entrepreneurial Attitude Orientation (EAO), the Entrepreneurial Potential Model (EPM) and the Davidsson's Model [5]. The following is a brief description of each theory.

The Entrepreneurial Event Model [6] explains the creation of new business as an interaction between initiatives, skills, management, relative autonomy and risk. The Theory of Planned Behavior [7] believes that a behavior must be planned and therefore can be identified from the perceived intentions. In this case three factors are met: (a) the subject's attitudes toward the behavior, (b) the subjective norms like the perception of other people's opinions of the proposed behavior, and (c) the subject's perception of behavioral control. The Entrepreneurial Attitude Orientation [8] proposed a scale to explain the entrepreneurial attitude. This scale is divided into: achievement, self-esteem, personal control, and innovation. Entrepreneurial Potential Model [9] was based on the work of [6] and [7]. Davidsson's Model [10] identifies the entrepreneurial intention from: (a) the conviction defined by general attitudes (willingness to change, competitiveness, money orientation, achievement, and autonomy) and domain attitudes (payoff, social contribution and know-how), and (b) the current situation.

Another perspective is presented in [11] that analyzed the influence of the family (e.g. father or grandfather) on entrepreneurial intention to children and grandchildren. Thus, the entrepreneurial intention is investigated through generations of families. Laspita, Breugst and Patzelt [11] found that parents and grandparents have a positive influence on entrepreneurial intention. Besides the significant influence of grandparents, the model also addresses the influence of culture on entrepreneurial intention. They found distinct

relationships of influence according to the local culture. Finally, the authors realized that the influence on entrepreneurial intention was higher in adolescence, then, as the young grow, so does the ability to influence the family in their entrepreneurial intention.

The family background holds a demonstrated part in the probability to create one's business, but many entrepreneurs do not have this background, and another advanced approach based on the identification of entrepreneurial fitness and skills does not make it possible to predict the occurrence of the phenomenon or the actor's identity. A certain number of authors emphasize the part to be played by the educational system in the promotion of an "enterprising spirit" prior to a business setting up intention, as cited in [12].

Policy makers believe that increased levels of entrepreneurship can be attained through education and especially entrepreneurship education. Several authors, such as [13] and [14] defend that education, by providing broad skills, training and knowledge facilitates the access to the business world through enabling individuals to assess the extent of the labor market, and the kind of goods customers demand, and to organize a business. For Carayannis, Evans and Hanson "there is no doubt that entrepreneurship education seeks to build knowledge and skills and also increases the likelihood of entrepreneurial success" (see [15]: 770). Furthermore, as cited in [16] and [17] added that entrepreneurship education increases the intention to start a new business. Hence, such education is promoted and implemented into school curricula in many of the European member countries and the United States. A key assumption underlying these programs is that entrepreneurship skills can be taught and are not fixed personal characteristics. Indeed, it has been shown that (1) the effect of general education as measured in years of schooling on entrepreneur performance is positive and (2) the business training is effective or the performance of people who applied for microfinance to start their own business (see [18]).

In this regard, many studies seek to analyze the entrepreneurial intention in young [19]-[23]. It is noteworthy that the school environment can also influence. For example, survey data from the Programme for International Student Assessment (PISA) - 2006, we investigated the influence of competition in private schools and found an increase in entrepreneurial intention of 11% to 18% above the international average [24].

This type of intervention in youth has shown positive results. Cheung [26] showed that one important objective of the entrepreneurial education programs in Hong Kong secondary schools was the development of students' personal attributes. For example: collaboration skills, communication skills, creativity, critical thinking skills, and self-management skills, among others.

Other activities observed by [25] include work in a team and the fact the student is an active learning agent. This allows students to enhance both individual and collaborative learning.

Entrepreneurial education for young people has been an important step towards the emergence of new entrepreneurs and thus contributed to increased competitiveness and development of areas in several countries. Despite the existence of some resource challenges (see [26]), which is observed is an increasing incentive to that kind of education at all levels (see [27]) From primary school it is possible to begin developing some entrepreneurial characteristics, advancing at the secondary level with the approach of the young to the business world and continue at the university which allows students to explore their potential entrepreneur with more security and ensure greater success in the labor market.

### III. IFRN

The Federal Institute of Education, Science and Technology of Rio Grande do Norte (IFRN) is a centuries-old institution of technical education in Brazil. Throughout its history has received different names: School for Craftsmen (1910), Industrial College (1937), Industrial College of Christmas (1942), Federal Technical School of Rio Grande do Norte (1968), Federal Center of Technological Education Rio Grande do Norte (1999) and the Federal Institute of Education, Science and Technology of Rio Grande do Norte (2008). This evolution demonstrates the approach of the institution to community and economic transformations that take place in Brazil. The IFRN always seeks to meet the demands that businesses need and thereby assist in national economic development [29], [30]. The chronology can be accessed at [33].

The IFRN - Mossoró Campus is part of the 354 units of the current Federal Network Science Education, Vocational and Technology in Brazil. It was founded on 29/12/1994 as a unit of the Federal Technical School in Mossoró. The significant oil production in the city (largest onshore production in Brazil at that time) prompted the installation of the first technical courses in mechanical and electrical engineering [29], [30]. Currently the IFRN - Mossoró campus has courses in the following ways:

- Integrated technical courses (secondary and technical education for young people, with a duration of 4 years);
- Subsequent technical courses (technical education for youth and adults who have completed secondary education, lasting two years);
- Undergraduate courses;
- Postgraduate courses;
- Courses of initial and continuing training (short courses).

In the particular case of technical courses, the education level is equivalent for both integrated and subsequent levels, distinguishing only the origin of the students, since most of the subsequent level students are students who have completed secondary education but are looking for training in order to enter the labor market.

The IFRN encourages entrepreneurship through courses in various disciplines involving the theme of entrepreneurship. All technical courses have a course in business management. Another initiative is through the installation of incubators. In

IFRN - Campus Mossoró, the business incubator aims to support new ventures generated from the students of various courses of the institution. The incubator always performs actions disclosure about the possibilities of interaction with the academic community. For example, workshops on business plan preparation, identification of entrepreneurial intention, among other actions. The incubator aims to be a center of entrepreneurial activities, attracting new ideas, projects, teachers and students who wish to develop entrepreneurship in some way.

### IV. DATA COLLECTION AND ANALYSIS

This paper presents the results from a survey designed to understand the entrepreneurial intentions of technical students from the IFRN – Campus Mossoró. The option of analyzing technical courses stemmed from the need to investigate the entrepreneurial predisposition and intention in younger students. Despite subsequent courses having little older students, these students are the same level of technical education than the integrated level. This research is a quantitative [28] study on entrepreneurial intention of students from the Federal Institute of Education, Science and Technology of Rio Grande do Norte (IFRN) - Campus Mossoró. In the academic year under review 302 students were enrolled in technical courses integrated in the technical level and 169 level course of subsequent, which totaled 471 students.

The survey named as Projeto Empreende IFRN was administered to IFRN students enrolled in two different technical courses (the integrated level – named as level 1, and the subsequent level – named as level 2). Students were approached during classes and invited to participate in the research. A total of 365 usable questionnaires were returned and used for the data analysis (77.5% of the universe of technical students).

Among respondents, fifty-seven percent were male and forty-three percent female. The respondents' age ranged from 13 to 30 years, with a mean of 17.4 years. Considering course distribution, sixty-seven percent of respondents were students of level 1 (integrated level) and thirty-three percent level 2 (subsequent level).

The survey included a question about the entrepreneurial behavior of students' parents (see [11]). Fig. 1 illustrates answers with 58.36% of respondents with no parental example, against 41.37% who reported having entrepreneurial parents (30.68% of respondents indicated that the business was still active, 7.12% that has been over for more than five years and 3.56% that the business has ended but still was active until 5 years ago).

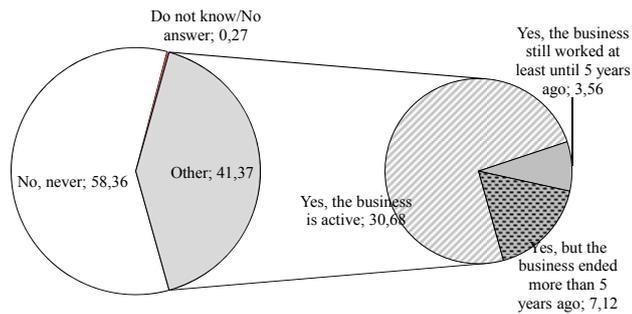


Fig. 1 Entrepreneurial behavior of students' parents

Based on received answers, a new variable was created to measure parents self-employed by coding the "yes" answers as 1=yes; otherwise 0=no.

The survey also analyzed students' perception about starting their own business and asked students: "Have you ever considered seriously starting your own business?" (Question adapted from [11]). The results indicate that the majority of respondents admitted to have already thought about having their own business (67.94%), including 44.38% who claim being determined to be their own boss in the future, and 20.82% who already abandoned the idea. The remaining positive options resulted in low percentages and it may be explained by the younger age of students. Table I summarizes results.

TABLE I  
STUDENTS' PERCEPTION ABOUT STARTING THEIR OWN BUSINESS

Have you ever considered seriously starting your own business?	Total	Total (%)
No, Never	115	31.51%
Yes, but I abandoned the idea	76	20.82%
Yes, I intend to be my own boss in future	162	44.38%
Yes, I'm already starting the process	5	1.37%
Yes, I am my own boss	2	0.55%
Yes, I've been my own boss but now I'm not	3	0.82%
Do not know/ No answer	2	0.55%
<b>Total</b>	<b>365</b>	<b>100.00%</b>

Students' responses were also analyzed considering respondents gender, course level and self-employed parents. Tables II-IV summarize the distribution of responses obtained.

The analysis of the students' perception about starting their own business by gender demonstrates that (Table II):

- Both genders reveal high perceptions by choosing the affirmative option "yes, I intend to be my own boss in the future" (43.00% in male students, and 46.20% in female students);
- Male students have a higher percentage of respondents who claim never to have considered the possibility of having their own business (32.85% of male students against 29.75% of female students).

TABLE II  
STUDENTS' PERCEPTION ABOUT STARTING THEIR OWN BUSINESS BY GENDER

Have you ever considered seriously starting your own business?	Gender		Total (%)
	Male (%)	Female (%)	
No, Never	32.85%	29.75%	31.51%
Yes, but abandoned the idea	20.29%	21.52%	20.82%
Yes, I intend to be my own boss in future	43.00%	46.20%	44.38%
Yes, I'm already starting the process	1.93%	0.63%	1.37%
Yes, I am my own boss	0.48%	0.63%	0.55%
Yes, I've been my own boss but not I'm not	0.48%	1.27%	0.82%
Do not know/ No answer	0.97%	0.00%	0.55%
<b>Total</b>	<b>207</b>	<b>158</b>	<b>365</b>
<b>in %</b>	<b>56.71%</b>	<b>43.29%</b>	<b>100.0%</b>

When comparing the course level, both level courses presented similar response distribution (Table III).

TABLE III  
STUDENTS' PERCEPTION ABOUT STARTING THEIR OWN BUSINESS BY COURSE LEVEL

Have you ever considered seriously starting your own business?	Course Level		Total (%)
	Level 1 (%)	Level 2 (%)	
No, Never	32.93%	28.57%	31.51%
Yes, but abandoned the idea	21.54%	19.33%	20.82%
Yes, I intend to be my own boss in future	43.50%	46.22%	44.38%
Yes, I'm already starting the process	1.22%	1.68%	1.37%
Yes, I am my own boss	0.00%	1.68%	0.55%
Yes, I've been my own boss but not I'm not	0.81%	0.84%	0.82%
Do not know/ No answer	0.00%	1.68%	0.55%
<b>Total</b>	<b>246</b>	<b>119</b>	<b>365</b>
<b>in %</b>	<b>67.40%</b>	<b>32.60%</b>	<b>100.0%</b>

Responses by self-employed parents reveal that (Table IV):

- The group with the lowest perception is that of respondents without self-employed parents (37.09% of the answers were "no, never"). Still, this group has 40.38% of respondents who claim determined to be his own boss in the future;
- The group with self-employed parents has a high perception, particularly with 50.33% of the respondents who claims to be determined to be "my own boss in the future".

TABLE IV  
STUDENTS' PERCEPTION ABOUT STARTING THEIR OWN BUSINESS BY SELF-EMPLOYED PARENTS

Have you ever considered seriously starting your own business?	Self-employed Parents		Total (%)
	Yes (%)	No (%)	
No, Never	23.84%	37.09%	31.51%
Yes, but abandoned the idea	20.53%	20.66%	20.82%
Yes, I intend to be my own boss in future	50.33%	40.38%	44.38%
Yes, I'm already starting the process	1.32%	1.41%	1.37%
Yes, I am my own boss	0.66%	0.47%	0.55%
Yes, I've been my own boss but not I'm not	1.99%	0.00%	0.82%
Do not know/ No answer	1.32%	0.00%	0.55%
<b>Total</b>	<b>151</b>	<b>213</b>	<b>365</b>
in %	41.37%	58.36%	100.0%

In order to test dependency relationships the analysis included chi-square tests between the perception of students and the variables gender, course level and self-employed parents. Results indicate that the students' perception about starting their own business only depends on the entrepreneurial behavior of student's parents ( $\chi^2 (5) = 11.184$ ,  $p < 0.05$ ).

Following [11] the students' perceptions about starting their own business were transformed into a new variable, named "thoughts about entrepreneurship" by coding the "yes" answers as 1 and the "no, never" option as 0 (1=yes, otherwise 0=no).

The students' entrepreneurial predisposition was measured by a question adapted from [13]: "Suppose you unexpectedly inherit 20 000 reais. How would you invest this money?" [Note: the *real* is the Brazilian currency]. Answer options were:

1. I invested in my own business
2. I invested in a car or house
3. I invested in an investment fund
4. I deposited in a bank account
5. Other

The received answers indicate that IFRN's students are divided between deposit money in a bank account (30.14%) or invest in a business of their own (29.59%). Invest in an investment fund is also chosen by 20% of IFRN's students (see Table V). These results suggest a cautious behavior by students, which may be interesting to explore in future research.

TABLE V  
ENTREPRENEURIAL PREDISPOSITION OF IFRN'S STUDENTS

Suppose you unexpectedly inherit 20 000 reais. How would you invest this money?	Total	Total (%)
I invested in my own business	108	29.59%
I invested in a car or house	49	13.42%
I invested in an investment fund	73	20.00%
I deposited in a bank account	110	30.14%
Other	25	6.85%
<b>Total</b>	<b>365</b>	<b>100.00%</b>

Students' responses were also analyzed considering

respondent's gender, course level, self-employed parents and thoughts about entrepreneurship. Tables VI-IX summarize the distribution of responses obtained.

TABLE VI  
ENTREPRENEURIAL PREDISPOSITION OF IFRN'S STUDENTS BY GENDER

Suppose you unexpectedly inherit 20 000 reais. How would you invest this money?	Gender		Total (%)
	Male (%)	Female (%)	
I invested in my own business	35.27%	22.15%	29.59%
I invested in a car or house	6.28%	22.78%	13.42%
I invested in an investment fund	20.77%	18.99%	20.00%
I deposited in a bank account	31.40%	28.48%	30.14%
Other	6.28%	7.59%	6.85%
<b>Total</b>	<b>207</b>	<b>158</b>	<b>365</b>
in %	56.71%	43.29%	100.0%

TABLE VII  
ENTREPRENEURIAL PREDISPOSITION OF IFRN'S STUDENTS BY COURSE LEVEL

Suppose you unexpectedly inherit 20 000 reais. How would you invest this money?	Course Level		Total (%)
	Level 1 (%)	Level 2 (%)	
I invested in my own business	28.46%	31.93%	29.59%
I invested in a car or house	13.82%	12.61%	13.42%
I invested in an investment fund	21.54%	16.81%	20.00%
I deposited in a bank account	30.89%	28.57%	30.14%
Other	5.28%	10.08%	6.85%
<b>Total</b>	<b>246</b>	<b>119</b>	<b>365</b>
in %	67.40%	32.60%	100.00%

TABLE VIII  
ENTREPRENEURIAL PREDISPOSITION OF IFRN'S STUDENTS BY SELF-EMPLOYED PARENTS

Suppose you unexpectedly inherit 20 000 reais. How would you invest this money?	Self-employed Parents		Total (%)
	Yes (%)	No (%)	
I invested in my own business	29.80%	29.58%	29.67%
I invested in a car or house	11.92%	14.55%	13.46%
I invested in an investment fund	22.52%	17.84%	19.78%
I deposited in a bank account	28.48%	31.46%	30.22%
Other	7.28%	6.57%	6.87%
<b>Total</b>	<b>151</b>	<b>213</b>	<b>364</b>
in %	41.48%	58.52%	100.0%

TABLE IX  
ENTREPRENEURIAL PREDISPOSITION OF IFRN'S STUDENTS BY THOUGHTS ABOUT ENTREPRENEURSHIP

Suppose you unexpectedly inherit 20 000 reais. How would you invest this money?	Thoughts about entrepreneurship		Total (%)
	Yes (%)	No (%)	
I invested in my own business	36.80%	13.91%	29.59%
I invested in a car or house	10.80%	19.13%	13.42%
I invested in an investment fund	19.20%	21.74%	20.00%
I deposited in a bank account	28.40%	33.91%	30.14%
Other	4.80%	11.30%	6.85%
<b>Total</b>	<b>250</b>	<b>115</b>	<b>365</b>
in %	68.49%	31.51%	100.00%

It was found relationships of dependency between:

1. The entrepreneurial predisposition and the gender of the student ( $\chi^2 (4) = 24.012$ ,  $p < 0.01$ );
2. The entrepreneurial predisposition and thoughts about entrepreneurship ( $\chi^2 (4) = 23.929$ ,  $p < 0.01$ ).

To understand the entrepreneurial intention of students, survey asked students to indicate their level of agreement with three different statements (Likert with 5 levels, ranging from 1-“I totally disagree” to 5-“I totally agree”). The statements were adapted from the works [31] and [32].

Results indicated an increased intention over time. When considering a two years limit, the majority of students reveal a high level of disagreement (67.95% of negative answers, i.e., the total of answers 1-“I totally disagree” with 2-“I disagree somehow”). If the time limit considered is 5 years, students divided between disagreement (35.89% of negative answers) and agreement (32.33% of positive answers, i.e., the total of answers 4-“I agree somehow” and 5-“I totally agree”). When the intention is just project someday in future, students reveal a high intention to be their own boss (66.57% of positive answers). The variations over time can be explained by the youth of students (they have a mean age of 17.4 years) and their hypothetical intention to continue their academic studies. Fig. 2 illustrates students' answers.

In order to explore the existence of significant differences, the entrepreneurial intention was compared by gender, course level and self-employed parents (t-tests). In a 2 years scenario, differences were identified for gender ( $p < 0.05$ ), course level ( $p < 0.01$ ) and thoughts about entrepreneurship ( $p < 0.01$ ). In a 5 years scenario, differences were identified for course level ( $p < 0.01$ ) and thoughts about entrepreneurship ( $p < 0.01$ ). If intention is projected someday in future, differences were only identified for thoughts about entrepreneurship ( $p < 0.01$ ). Interestingly, when analysis considered the variable self-employed parents no differences were identified. Results are summarized in Table X.

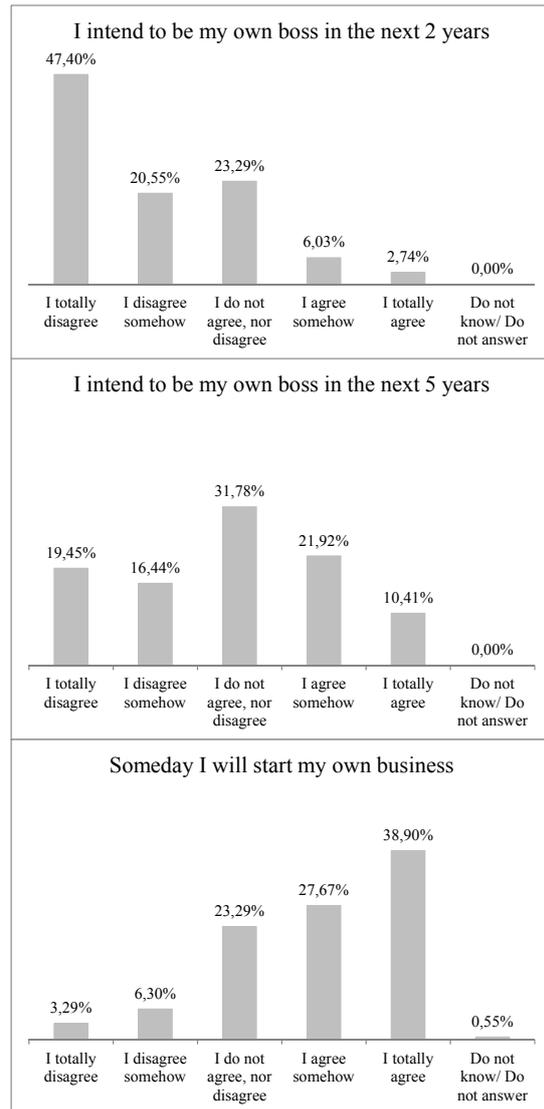


Fig. 2 Entrepreneurial intention of students

TABLE X  
ENTREPRENEURIAL INTENTION

	Gender		Course Level		Self-employed Parents		Entrepreneurial Thoughts	
	Female	Male	Level 1	Level 2	Yes	No	Yes	No
I intend to be my own boss in the next 2 years	1.82	2.07*	1.75	2.39**	2.05	1.90	2.10	1.67**
I intend to be my own boss in the next 5 years	2.81	2.92	2.67	3.29**	2.91	2.85	3.07	2.44**
Someday I will start my own business	3.92	3.94	3.89	4.01	4.02	3.87	4.24	3.2**6

\*  $p < 0.05$ ; \*\*  $p < 0.01$

Since the campus of IFRN of Mossoró has a business incubator, the survey also questioned students if they were aware of its meaning (“Do you know the meaning of business incubator?”). 61.1% of respondents had chosen the No option, against 38.9% of Yes. These results may suggest the need for greater disclosure of the business incubator's.

To explore the perceptions about creativity to business ideas, students also indicate their level of agreement with two different statements (Likert with 5 levels, ranging from 1-“I

totally disagree” to 5-“I totally agree”):

1. “Is difficult to find an original idea for a business”;
2. “The creative environment of IFRN Mossoró inspires the development of ideas for new business”.

The results suggest a distribution of responses among the different response options, with 43.3% of students agreeing that is difficult (43.29% of positive answers, 30.68% of negative responses and 23.56% neutral). The majority of respondents also agree with the creative environment of IFRN

(72.33% of positive answers) (see Fig. 3).

In order to explore the existence of significant differences, the answers were compared by gender; course level and self-employed parents (t-tests). No differences were identified for the barrier of find an original idea. The perception of the creative environment has differences just for thoughts about entrepreneurship ( $p < 0.10$ ). Results are summarized in Tables XI and XII.

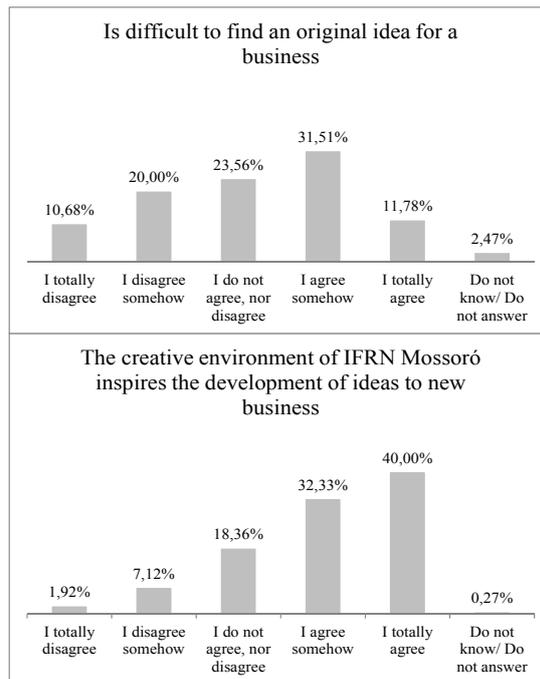


Fig. 3 Creativity to business ideas

TABLE XI  
CREATIVITY TO BUSINESS IDEAS: GENDER AND COURSE LEVEL

	Gender		Course level	
	Female mean	Male mean	Level 1 mean	Level 2 mean
Is difficult to find an original idea for a business	3.13	3.15	3.19	3.04
The creative environment of IFRN Mossoró inspires the development of ideas to new business	4.03	4.01	4.05	3.94

\*  $p < 0.10$

TABLE XII  
CREATIVITY TO BUSINESS IDEAS: SELF-EMPLOYED PARENTS AND THOUGHTS ABOUT ENTREPRENEURSHIP

	Self-employed Parents		Entrepreneurial Thoughts	
	Yes mean	No mean	Yes mean	No mean
Is difficult to find an original idea for a business	3.17	3.12	3.09	3.26
The creative environment of IFRN Mossoró inspires the development of ideas to new business	4.03	4.02	4.08	3.87 *

\*  $p < 0.10$

The analysis also investigated the existence of relations of dependency between the perceptions of creativity to business ideas and the students' awareness of the meaning of business incubator (Qui-square tests of independency). Results confirmed the dependency only for IFRN creative environment and awareness ( $\chi^2(4) = 15.893, p < 0.01$ ).

V. CONCLUSIONS

The Federal Institute of Education, Science and Technology of Rio Grande do Norte (IFRN) - Campus Mossoró is a Brazilian institution of technical education which has 50% of its offer for young people seeking education at secondary level and/or technological. Entrepreneurship is assumed as an important alternative to job creation and IFRN promotes it by offering courses involving the theme of creation and

management of companies and the availability of an incubator.

However, this dynamic has not received a significant response from your students, particularly near the incubator, so it is important to try to understand their entrepreneurial predisposition and intent.

The survey analyzed responses from 365 students of technical courses. The results indicate a reasonable entrepreneurial behavior of parents, with 41.37% with entrepreneurial behavior, including 30.68% of the business still active with parents.

When questioned if they already thought about creating their own business, 68.94% of the respondents assume have thought, including 44.38% with stated intention that they will be their own boss in the future. Results indicate that the

students' perception about starting their own business only depends on the entrepreneurial behavior of student's parents.

The results indicate a predisposition cautious behavior, with 30.14% of respondents chose the option of depositing money in the bank and 20% in investment fund. It was found relationships of dependency between the entrepreneurial predisposition and the gender and thoughts about entrepreneurship.

The entrepreneurial intention increases over time, i.e., is smaller when quantified than 2 years and is greatest when intention is just project someday in future. The variations over time can be explained by the youth of students and their hypothetical intention to continue their academic studies.

Regarding business incubator, 61.1% of respondents admit to not knowing its meaning. Nevertheless, when questioned about the creative environment of IFRN, 72.33% of respondents recognize the IFRN inspires the development of ideas for new business.

These results are an important contribution to understanding the importance of context and institutions in the formation of entrepreneurial intention. Although preliminary, the results of the survey showed good entrepreneurial intention of students. However, as intention is unlikely to be achievable in the short term, this will have effects on the performance of the incubator. At the level of the incubator, results suggest a greater emphasis on disclosure and possibly a reassessment of its position with the proposed tendering, specific training, coaching and Idea Lab.

#### ACKNOWLEDGMENTS

The authors wish to acknowledge the support of CGIT and Algoritmi R&D Centre, two research centres at the University of Minho, Portugal. This work has been supported by FCT (Fundação para a Ciência e Tecnologia, Portugal) in the scope of the projects PEst-OE/EEI/UI0319/2014 and Pest-OE/EME/UI0252/2012.

#### REFERENCES

- [1] GEM. "GEM Portugal 2010 Report" (in Portuguese). 2012.
- [2] J. Crayford, C. Fearon, H. McLaughlin, and W. van Vuuren, "Affirming entrepreneurial education: learning, employability and personal development," *Industrial and Commercial Training*, vol. 44, no. 4, pp. 187–193, 2012.
- [3] I. M. Kirzner, "Competition and Entrepreneurship". Chicago: University of Chicago Press. 1973.
- [4] GEM. "Entrepreneurship in Brazil". Curitiba: IBQP, 2012. 162 p.
- [5] M. Guerrero, J. Rialp, and D. Urbano, "The impact of desirability and feasibility on entrepreneurial intentions: A structural equation model," *International Entrepreneurship and Management Journal*, vol.4, pp. 35–50, 2008.
- [6] A. Shaper, "Social dimensions of entrepreneurship". In C. A. Kent et al. (Eds.), *The encyclopedia of entrepreneurship* (pp. 72–89). Englewood Cliffs, NJ: Prentice-Hall, 1982.
- [7] I. Ajzen, "The theory of planned behavior," *Organizational Behavior and Human Decision Processes*, vol. 50, pp. 179–211, 1991.
- [8] P. B. Robinson, D. Stimpson, J. C. Huefner, and H. K. Hunt, "An attitude approach to the prediction of entrepreneurship", *Entrepreneurship Theory and Practice*, vol. 15, no. 4, pp. 13–31, 1991.
- [9] N. F. Krueger, and D. Brazeal, "Entrepreneurial potential and potential entrepreneurs", *Entrepreneurship Theory and Practice*, vol. 18, no. 3, pp. 91–104, 1994.
- [10] P. Davidsson, "Culture, structure and regional levels of entrepreneurship", *Entrepreneurship and Regional Development*, vol. 7. No. 1, pp. 41–62, 1995.
- [11] S. Laspita, N. Breugst, S. Heblich, and H. Patzelt, "Intergenerational transmission of entrepreneurial intentions," *Journal of Business Venturing*, vol. 27, no. 4, pp. 414–435, 2012.
- [12] D. Frugier, C. Verzat, R. Bachelet, and A. Annachi, "Helping engineers to become entrepreneurs. Attitudes, behaviours, beliefs, skills: what are the educational factors in their entrepreneurial spirit?", Paper read at IntEnt 2003 Internationalising Entrepreneurship Education and Training, Grenoble, France, September 2003.
- [13] R. Raijman, "Determinants of entrepreneurial intentions: Mexican immigrants in Chicago", *Journal of Socio-Economics*, vol. 30, pp. 393–411, 2001.
- [14] B. Askun, and N. Yildirim, "Insights on entrepreneurship education in public universities in Turkey: creating entrepreneurs or not?", *Procedia Social and Behavioral Sciences*, vol. 24, pp. 663–676, 2011.
- [15] E. G. Carayannis, D. Evans, and M. Hanson, "A cross-cultural learning strategy for entrepreneurship education: outline of key concepts and lessons learned from a comparative study of entrepreneurship students in France and the US", *Technovation*, vol. 23, pp. 757–771, 2003.
- [16] V. Souitaris, S. Zerbinati, and A. Al-Laham, "Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources", *Journal of Business Venturing*, vol. 22, pp. 566–591, 2007.
- [17] G. Von Graevenitz, D. Harhoff, and R. Weber, "The effects of entrepreneurship education", *Journal of Economic Behavior & Organization*, vol. 76, pp. 90–112, 2010.
- [18] H. Oosterbeek, M. Van Praag, and A. Ijsselstein, "The impact of entrepreneurship education on entrepreneurship skills and motivation", *European Economic Review*, vol. 54, pp. 442–454, 2010.
- [19] A. Steenekamp, S. Merwe, and R. Athayde, "Application of the Attitude Toward Enterprise (ATE) test on secondary school learners in South Africa," *South African Journal of Economic and Management Sciences*, vol. 14, no. 3, pp. 314–332, 2011.
- [20] A. M. F. Paço, J. M. Ferreira, M. Raposo, R. G. Rodrigues, and A. Dinis, "Behaviours and entrepreneurial intention: Empirical findings about secondary students", *Journal of International Entrepreneurship*, vol. 9, no. 1, pp. 20–38, Jan. 2011.
- [21] O. Falck, S. Heblich, and E. Luedemann, "Identity and entrepreneurship: do school peers shape entrepreneurial intentions?", *Small Business Economics*, pp. 39–59, 2012.
- [22] J. J. Ferreira, M. L. Raposo, R. G. Rodrigues, A. Dinis, and A. Paço, "A model of entrepreneurial intention: An application of the psychological and behavioral approaches," *Journal of Small Business and Enterprise Development*, vol. 19, no. 3, pp. 424–440, 2012.
- [23] C. S. Marques, J. J. Ferreira, D. N. Gomes, and R. G. Rodrigues, "Entrepreneurship education: How psychological, demographic and behavioural factors predict the entrepreneurial intention", *Education + Training*, vol. 54, no. 8, pp. 657–672, 2012.
- [24] O. Falck, and L. Woessmann, "School competition and students' entrepreneurial intentions: International evidence using historical Catholic roots of private schooling," *Small Business Economics*, pp. 459–478, 2013.
- [25] C. W. M. Yu, and T. W. Y. Man, "The sustainability of enterprise education: a case study in Hong Kong", *Education + Training*, vol. 49, no. 2. Pp. 138-152, 2007.
- [26] C. Cheung, "Entrepreneurship education in Hong Kong's secondary curriculum: possibilities and limitations," *Education + Training*, vol.50, no. 6, pp. 500-515, 2008.
- [27] S. Z. Ahmad, "The need for inclusion of entrepreneurship education in Malaysia lower and higher learning institutions", *Education + Training*, vol. 55, no. 2, pp. 191–203, 2013.
- [28] J. W. Creswell, "Research design: qualitative, quantitative, and mixed methods approaches". 2 ed. Porto Alegre: Artmed, 2007, 248p.
- [29] E. A. C. Pegado, "A trajetória do CEFET – RN: do início do século XX ao alvorecer do século XXI" (in Portuguese). Natal: IFRN, 2010.
- [30] E. M. Pacheco, "Os Institutos Federais: uma revolução na educação profissional e tecnológica" (in Portuguese). Natal: IFRN, 2010.
- [31] A. Kuckertz, and M. Wagner, "The influence of sustainability orientation on entrepreneurial intentions - Investigating the role of business experience", *Journal of Business Venturing*, vol. 25, pp. 524–539, 2010.

- [32] J. R. Fitzsimmons, and E. J. Douglas, "Interaction between feasibility and desirability in the formation of entrepreneurial intentions", *Journal of Business Venturing*, vol. 26, pp. 431–440, 2011.
- [33] Memory Portal. IFRN. Retrieved from: <<http://centenario.ifrn.edu.br/>>. 11 April 2014.

**Giovane Gurgel** is a Computer Engineering Graduate, Technology Center, University of Rio Grande do Norte, Brazil (2005), MSc in Business Administration, Centre for Applied Social Sciences, University of Rio Grande do Norte, Brazil (2008) and Specialist in Information Technology Management, Centre for Applied Social Sciences, University of Rio Grande do Norte, Brazil (2010).

He worked as systems programmer at newspaper company Tribuna do Norte (2008-2009), and since 2009 he is Professor at the Technical Course in Informatics, Instituto Federal de Educação, Ciência e Tecnologia do Rio Grande do Norte – Campus Mossoró, Brazil. He is the author of scientific papers published in conference proceedings and coordinator of a business incubator. Main research interests include business incubators, web applications and managing innovation.

**Cristina Rodrigues** is an Assistant Professor at the University of Minho, where teaches and is responsible for courses in applied statistics at undergraduate and postgraduate studies in engineering. With professional experience in the field of industrial engineering and management, she is PhD in Industrial and Systems Engineering, University of Minho, in the area of Numerical and Statistical Methods. She is also a researcher at the Center Algoritmi, where is developing research in industrial engineering and applied statistics. She regularly collaborates with other institutions or research centers (e.g. University of Porto, centers CGIT and C2T2). Currently she is a member of the Board Committee of the Master in Engineering and Quality Management, University of Minho.

**Filipa Vieira** is a Production Engineering Graduate, School of Engineering, University of Minho, Portugal (1993), MSc in International Commerce, School of Economics and Management, University of Minho, Portugal (1998) and PhD in Economic Engineering, University of Minho, Portugal (2007). She worked as an Assistant at the Department of Production and Systems, School of Engineering, University of Minho (1993-2007) and since 2007 she is Auxiliary Professor at the Department of Production and Systems, University of Minho, Portugal. She is the author of scientific papers published in international journals and conference proceedings. Main research interests include entrepreneurship and managing innovation.