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## Article

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**CHALLENGES OF EVALUATION OF THE INFLUENCE OF ENTREPRENEURSHIP EDUCATION\***

Sunčica Oberman Peterka \*\*, Tihana Koprivnjak \*\*\*, Petra Mezulic\*\*\*\*

**ABSTRACT**

*The need for entrepreneurial behaviour and activity in all aspects of life is becoming more pronounced, and education has a decisive role in the creation of an entrepreneurial society and entrepreneurial culture. The number of educational programmes in entrepreneurship at all levels of education is steadily increasing worldwide. It is often said that entrepreneurship education is one of the most important development and economic mechanisms. Organizational structure, content, methodology and pedagogy differ from programme to programme, but all of them are created because of similar motives: to stimulate economic development of the environment in which they operate. Entrepreneurship education has a positive influence on the development of entrepreneurial spirit of young people, their intentions towards starting their own business, their employability and, ultimately, their role in society and economy. Although the importance of entrepreneurship education is almost universally accepted, there are numerous problems in measuring the impact of such education. In the case of entrepreneurship education, the traditional tools for assessing the knowledge acquired are not applicable.*

*The objective of the paper is to present the different approaches in evaluation of impact of entrepreneurship education and to introduce a tool for assessing the impact of*

*entrepreneurship education, developed within the European project ASTEE<sup>1</sup>. The aim of the ASTEE project was to develop a joint European tool for measuring the effects of education for development of entrepreneurial competences at all educational levels (primary, secondary and tertiary education). The paper will also present the results of research conducted within the project in Croatia.*

**Keywords:** entrepreneurship, education, impact of entrepreneurship education

**JEL:** I29, L26

**1. INTRODUCTION**

The need for entrepreneurial activity and behaviour in all aspects of society is becoming more and more pronounced where education is crucial for the creation of an entrepreneurial society and entrepreneurial culture (Jack and Anderson 1999, Singh and Magee 2001: 2, Kirby 2004, Gibb 2002, Henry et al. 2005, Galloway et al. 2005, Oberman Peterka 2008).

Entrepreneurship education is increasingly being talked about, but authors mean different

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<sup>1</sup> ASTEE project (2012-2014) was implemented by partners from Denmark, France, Portugal, Germany, Ireland, Germany, Croatia and Belgium, and co-financed by the European Union through the Competitiveness and Innovation Framework Programme (CIP).

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things by the term *entrepreneurship education*. Entrepreneurship education is often defined as education closely related to small business, its launch and development (Kourilsky, 1995, cited in Jones and English, 1999: 417, Alberti, 1999, cited in Holmgren and From 2005: 385), while other authors have a broader view of entrepreneurship education, not giving it exclusively and solely economic relevance. Entrepreneurship education is linked to the development of creativity and innovation, as well as the development of other entrepreneurial skills, attributes and behaviours, which can be applied in different contexts and situations, not only business (Hannon, 2005: 3, Holmgren and From, 2005: 385, Gibb, 2002).

The number of educational programmes in entrepreneurship at all levels of education is steadily increasing worldwide. Although these programmes differ by organizational structure, content, methodology and pedagogy, all of them are created because of similar motives: to stimulate economic development of the environment in which they operate (Holmgren and From 2005, Jack and Anderson 1999, Kirby 2004), and they are often considered the most important development and economic mechanism.

Lack of a unified concept of entrepreneurship education has led to different understandings of what should be the goal of such education, how should entrepreneurship education programmes be organized, which pedagogy and methodology should be used, who should be involved in the execution of these programmes, and how should they be evaluated.

## 2. PREVIOUS RESEARCH

Entrepreneurship is a subject of growing interest at universities and business schools throughout the world. The primary reason for this are global changes that are felt all around us; in business and private worlds, new technologies, as well as new emerging global markets (Henry et al. 2005: 100). In light of these changes, it is shown that entrepreneurial skills, attributes and behaviours, at all levels of society, are crucial for coping and managing in a complex and uncertain environment (Gibb and Cotton 1998, Gibb 2002b, Henry et al. 2005).

Emergence of an increasing number of entrepreneurship programmes has brought a great number of questions and problems. One of them is certainly how to assess and how to evaluate entrepreneurship programmes.

Evaluation of entrepreneurship education is ambiguous and it refers to the assessment of the effectiveness of programmes, and the ways of evaluating students involved in entrepreneurship programmes (Oberman Peterka, 2008).

The field of student evaluation is a recognized weakness of entrepreneurship programmes throughout the world, and pressures for a change in the way and the form of assessment of educational programmes are occurring (Gibb, 2002). If it is expected from programme assessment to estimate and evaluate the extent to which students' entrepreneurial behaviours, characteristics and skills have developed, then many agree that this is a very difficult task due to the ever-present subjectivity (Gibb and Cotton 1998, Gibb 2002b, Vesper and Gartner 1997). Some believe that a business plan can be a good measure (Solomon et al 2002), while others disagree, stating that someone can be very enterprising in writing a business plan, but

the business plan itself can be a result of a very formal and uninspiring process. Others believe that starting and running a venture (not necessarily a for-profit company) is also a good measure, but the estimate of the degree of entrepreneurial behaviour involved in this process, and achieved personal development are susceptible to strong subjectivity (Gibb and Cotton 1998, cited in Oberman Peterka, 2008). Some universities are introducing evaluation of students by the students themselves ("*peer evaluation*"), and thus the focus of the programme shifts from lecturer to student. Students are fully qualified for the assessment of their colleagues since they are familiar with the task, they bring student perspective to the evaluation process and are aware of the performance of each member of their group, as well as the performance of other groups (Jones and English, 2004).

Some authors (Solomon et. al., 2002) think that entrepreneurship programmes should combine traditional (test, essays, etc.) and contemporary – entrepreneurial methods of evaluation (evaluation of students by other students, use of "live" case studies).

In any case, evaluation of all educational programmes, including entrepreneurship programmes, should be built on a system of criteria which will answer the question whether or not a student has mastered the material, and consider the extent to which the student will benefit from that course. The criteria should be linked to group dynamics, participation in virtual ventures, creativity and innovation in the execution of tasks. Each of these criteria should carry an appropriate percentage of the overall student grade.

Measuring the effects of entrepreneurship education programmes is also vital for the development of this area; measured by the number, types and growing rate of newly

created companies, through measuring the contribution to the development of the economy, and through employment and the degree of satisfaction with career and students' career development (Solomon et al., 2002, McMullan and Long, 1987).

In an attempt to evaluate 50 entrepreneurship programmes, it is stated that it is very difficult to measure the effectiveness of entrepreneurship programmes for several reasons (Hytti and O'Gorman, 2004):

- It is very difficult to link the intention and methods of the programme with the result of the programme, since there is a time lag between the entry into the educational process and the corresponding results of that educational process;
- It is unclear how to measure the result of entrepreneurship education: whether through the number of newly started companies, entrepreneurial activity during one's career, evaluation of company performance or job satisfaction;
- It is difficult to compare results of different entrepreneurship programmes, because they have different objectives and apply different teaching methods.

However, despite these difficulties, Hytti and O'Gorman (2004) believe that it is possible to identify the key success factors that can be applied in different contexts, where the aims and the applied methods are sufficiently similar. They relate these key factors to three core issues:

1. Aim and objective of entrepreneurship programme
2. Possibility of improvement of the methods applied in entrepreneurship programmes, and

3. Issue of training the trainers in entrepreneurship programmes, since it has been shown that this issue is the critical obstacle to effective entrepreneurship programmes.

Jack and Anderson (1998, cited in Henry et al. 2005) have developed a framework for evaluation of entrepreneurship programmes, which highlights the need to measure the impact of individual programme elements over time. Other authors also (Wyckham 1989, Fleming 1996, Clark et al. 1984, cited in Henry et al. 2005) emphasize the lack of longitudinal research in the field of entrepreneurship education and measurement of the effects of these programmes. Garavan and O'Conneide (1994, cited in Henry et al. 2005) suggest that in addition to longitudinal research, which is essential for getting answers about the effects of entrepreneurship education, control groups should also be used, for the purpose of comparison of the development of students who have not attended entrepreneurship programmes with those that have.

Evaluation of entrepreneurship programmes is one of the most intriguing topics of research, given the diversity of programmes, their definition, goals, processes, activities and results. There is a lack of research on this subject in literature, but the full acceptance and accreditation of entrepreneurship programmes will depend exactly on solving this problem. (Gibb and Cotton 1998).

### 3. ASTEE PROJECT

The problem of measuring impact of entrepreneurial education is widely recognized and is therefore in the focus of numerous researches. The ASTEE project (Assessment Tools and Indicators for Entrepreneurial Education) was created with the main objective of developing a set of

common European tools for measuring the impact of entrepreneurship education on students' entrepreneurial competences across all education levels. The project lasted 18 months, from December 2012 until June 2014 and it was co-financed by the Competitiveness and Innovation Framework Programme (CIP) of the European Community. The project partners were: Foundation for Entrepreneurship Young Enterprise (Denmark), EMLYON Business School (France), PEEP – Platform for Entrepreneurship Education (Portugal), University of Applied Sciences Munich (Germany), Dublin Institute for Technology (Ireland), Junior Achievement – Young Enterprise Europe (Belgium) and J.J. Strossmayer University of Osijek, Faculty of Economics (Croatia). The members representing these countries worked on the development process of assessment tools for measuring the impact of entrepreneurship education, while the testing was also carried out in additional six countries: Sweden, the United Kingdom, Austria, Italy, Romania and Spain.

Looking beyond the scope of the ASTEE project, the prospects for the use of the tools are to measure entrepreneurship competences in the short and in the long run – similar to PISA; to give insight at all three levels – in contrast to PISA; to allow for measurement, not only at the three educational levels, but also at the individual, institutional and national levels and to allow for comparisons between institutions and nations thus indicating to policy makers which public strategies to pursue.<sup>2</sup>

<sup>2</sup>ASTEE project brochure, available at: <http://archive.ja-e.org/Download/DianaD.pdf> (September 22, 2015)

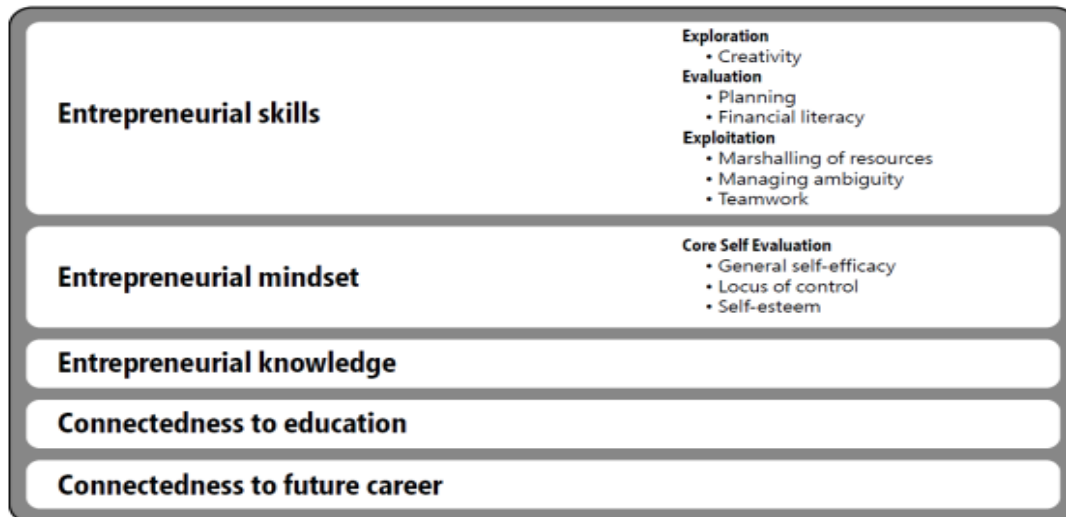


Figure 3.1. The dimensions and constructs included in the questionnaires

Source: *How to assess and evaluate the influence of entrepreneurship education – A report of the ASTEE project with a user guide to the tools, 2014*

### 3.1. Description of ASTEE assessment tool

The EU definition of entrepreneurship as a key competence for lifelong learning and knowledge was the basis for identifying relevant indicators for the survey in this project, complemented with previous research and empirical studies. As a result of the project, a set of common tools has been developed, in the form of a self-assessment questionnaire, with a total of 48 questions at primary level, 64 questions at secondary level and 57 at tertiary level. It is used for assessing entrepreneurial skills, mindset, knowledge, connectedness to education and connectedness to future career, as shown below (Figure 3.1.)

The decision was made about the target age of students at primary, secondary and tertiary levels of education. At the primary level questionnaire was made to target students aged 10-11, students aged 16-17 at the

secondary level, while students aged 20+ were targeted at the tertiary level.

#### **Entrepreneurial skills**

The ASTEE project defined skills as “the combination of the knowledge, the knowhow and the experiences that have been acquired and that are necessary / useful in order to carry out an activity in a professional way.”<sup>3</sup> Entrepreneurial activities require many different types of skills and abilities, both cognitively-oriented skills and skills of a more non-cognitive character<sup>4</sup>. There are different views on which types of skills entrepreneurship education should focus on, and the European Union has identified a large number of skills that are important for

<sup>3</sup> How to assess and evaluate the influence of entrepreneurship education: a report of the ASTEE project with a user guide to the tools (2014), available at: [http://archive.jaye.org/Download/jaye/ASTEE\\_REPORT.pdf](http://archive.jaye.org/Download/jaye/ASTEE_REPORT.pdf) (September 22, 2015)

<sup>4</sup> Kuratko and Hodgetts, 2004; Rosendahl-Huber, Sloof and Van Praag, 2012, cited in How to assess and evaluate the influence of entrepreneurship education: a report of the ASTEE project with a user guide to the tools (2014), available at: [http://archive.jaye.org/Download/jaye/ASTEE\\_REPORT.pdf](http://archive.jaye.org/Download/jaye/ASTEE_REPORT.pdf) (September 22, 2015)



entrepreneurial activities. Skills have been grouped in six categories within the ASTEE project: creativity, planning, financial literacy, resource marshalling, managing uncertainty, and teamwork. A different set of skills is needed in different phases of entrepreneurial process.

### ***Entrepreneurial mindset***

“Entrepreneurial mindset is focused on actions and responsibilities, since it is important for pupils and students to understand their role as active agents and creators of their own future.”<sup>5</sup> In the ASTEE project various attitudes are measured by Core Self Evaluation (CSE), developed by Judge, Eres, Bono and Thoresen<sup>6</sup>, and it measures individuals’ general self-efficacy, locus of control, and self-esteem.

### ***Entrepreneurial knowledge***

Educational system is constantly assessing knowledge and it has a long tradition of assessing it so this was the main reason for incorporating this dimension in the assessment tool. The European Union through its DG Enterprise and Industry has identified the areas of important knowledge, such as: knowledge about how to identify opportunities, the bigger picture regarding the context in which people live and work, how the economy functions, as well as ethical

positions of enterprises. Since these are areas that are difficult to measure, ASTEE focused of “assessing pupils and students perception of their knowledge, as it relates to their perception of their skills and abilities.”<sup>7</sup>

### ***Connectedness to education***

“Relationships with classmates and teachers play an important role here, as well as to what extent the pupils find their education purposeful and useful.”<sup>8</sup> The main focus within the ASTEE project was on student-teacher relationship since this has been demonstrated to be a good proxy for other dimensions as well. The main goal and focus of this measure is to assess to which extent teachers encourage pupils and students to act proactively and to engage in innovative and entrepreneurial activities.

### ***Connectedness to future career***

It is very important for the pupils and students to be able to connect their learning process with the real job assignments in their future work life. Job descriptions as well as knowledge intensity are constantly changing and as a result of that, educational requirements are becoming higher. When measuring this dimension, ASTEE project “focused on the pupils and students’ enterprising activities in the present and not only included questions about their work experience, but also questions about whether

<sup>5</sup> How to assess and evaluate the influence of entrepreneurship education: a report of the ASTEE project with a user guide to the tools (2014), available at: [http://archive.jaye.org/Download/jaye/ASTEE\\_REPORT.pdf](http://archive.jaye.org/Download/jaye/ASTEE_REPORT.pdf) (September 22, 2015)

<sup>6</sup> Judge, Eres, Bono, and Thoresen, 2003, cited in How to assess and evaluate the influence of entrepreneurship education: a report of the ASTEE project with a user guide to the tools (2014), available at: [http://archive.jaye.org/Download/jaye/ASTEE\\_REPORT.pdf](http://archive.jaye.org/Download/jaye/ASTEE_REPORT.pdf) (September 22, 2015)

<sup>7</sup> How to assess and evaluate the influence of entrepreneurship education: a report of the ASTEE project with a user guide to the tools (2014), available at: [http://archive.jaye.org/Download/jaye/ASTEE\\_REPORT.pdf](http://archive.jaye.org/Download/jaye/ASTEE_REPORT.pdf) (September 22, 2015)

<sup>8</sup> How to assess and evaluate the influence of entrepreneurship education: a report of the ASTEE project with a user guide to the tools (2014), available at: [http://archive.jaye.org/Download/jaye/ASTEE\\_REPORT.pdf](http://archive.jaye.org/Download/jaye/ASTEE_REPORT.pdf) (September 22, 2015)

they have started or led any activities outside school, whether they engage in volunteer work, and their experience with self-employment.”<sup>9</sup>

The tools are intended to be applicable in all disciplines and areas of education. After the pilot study, the data were analyzed to assure validity of the questionnaire. Using Structural Equation Modelling and analysis, such as confirmatory factor analysis, factorial invariance and known group analysis it has been shown “that measures are reliable, that the questions provide a good reflection of their intended dimensions and that they are understood in the same way by the respondents regardless of their background and that they are valid measures of entrepreneurial behavior”<sup>10</sup>.

### 3.2. Results of the research project in Croatia

During the ASTEE project, the research has been carried out in 13 countries, questioning a total of 6,488 students across all education levels.

Since Josip Juraj Strossmayer University of Osijek was the project partner in Croatia, the pilot study within the project was carried out in primary and secondary schools and faculties in the city of Osijek. A total of 644 pupils and students were surveyed. The study included 181 pupils from three elementary

schools aged 10 to 11 years, 222 pupils from 4 secondary schools aged 16 to 17 years (two grammar schools and two vocational schools) and 241 students aged 20 and over, from 5 faculties and departments of the Josip Juraj Strossmayer University of Osijek (Faculty of Economics, Faculty of Civil Engineering, Faculty of Law, Faculty of Food Technology and Department of Culturology).

Special attention in the analysis of data is focused on the comparison of responses of pupils of primary and secondary schools, and students, and the analysis of the differences between them. One to two questions have been isolated, which relate to individual dimensions of the tool, but which by themselves can also be a source of certain conclusions and a basis for discussion.

The analysis of the responses to the questions about self-assessment (part of the dimension Entrepreneurial mindset; *I am confident I will succeed in life* and *Overall, I am satisfied with myself*), show high self-confidence of elementary school pupils in relation to the two other groups of examinees (Chart 3.1.); almost 57% of the primary school pupils “strongly agree” compared to 23% of the students and 21% of the secondary school pupils. Likewise, 56% of the primary school pupils have shown “high” satisfaction with themselves, while only 17.4% of the students and 14% of the secondary school pupils gave the same answer to the question (Chart 3.1.). What had happened in the meantime: was the sense and belief in oneself lost between the elementary school and faculty? Can (and should) the development of this personality trait be the goal of education? Self-confidence is important regardless of what an individual is going to do in life, while one can hardly be successful in anything without it. Although these are not large differences in responses, it is interesting to comment that secondary

<sup>9</sup> How to assess and evaluate the influence of entrepreneurship education: a report of the ASTEE project with a user guide to the tools (2014), available at: [http://archive.jaye.org/Download/jaye/ASTEE\\_REPORT.pdf](http://archive.jaye.org/Download/jaye/ASTEE_REPORT.pdf) (September 22, 2015)

<sup>10</sup> How to assess and evaluate the influence of entrepreneurship education: a report of the ASTEE project with a user guide to the tools (2014), available at: [http://archive.jaye.org/Download/jaye/ASTEE\\_REPORT.pdf](http://archive.jaye.org/Download/jaye/ASTEE_REPORT.pdf) (September 22, 2015)



school pupils have shown the least belief in themselves, which may lead us to the conclusion that secondary education must take more account of the development of these personality traits of pupils, especially since this is a very sensitive period in the development of every person.

Almost 50% of the primary school pupils believe that school has taught them creativity as opposed to only 6% of the secondary school pupils; 44% of the primary school pupils and only 6% of the secondary school pupils think that they have learned how to come up with ideas in school, and only 28% of the primary school pupils and 5% of the

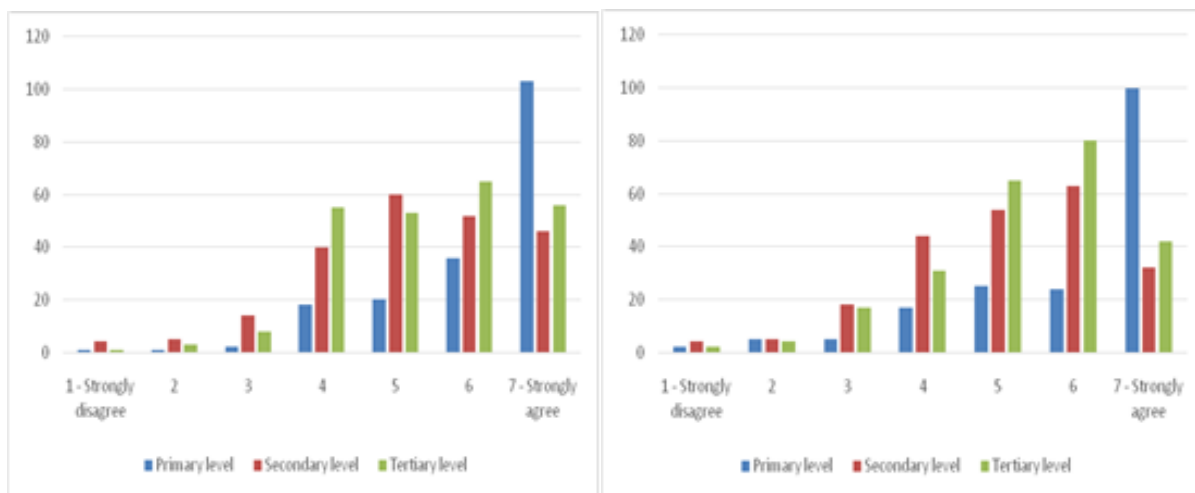


Chart 3.1. I am confident I will succeed in life and Overall, I am satisfied with myself

Source: Research data

The responses to several questions deal with methods of teaching in primary and secondary schools (*teaching methods*)<sup>11</sup>: *In school, I have been thought how to think creatively, In school, I have been thought how to come up with ideas, In school, I have been thought how to translate ideas into action.*

secondary school pupils believe that they have learned how to translate ideas into action (Chart 3.2. and 3.3.).

<sup>11</sup> This question is included in the questionnaire for students.

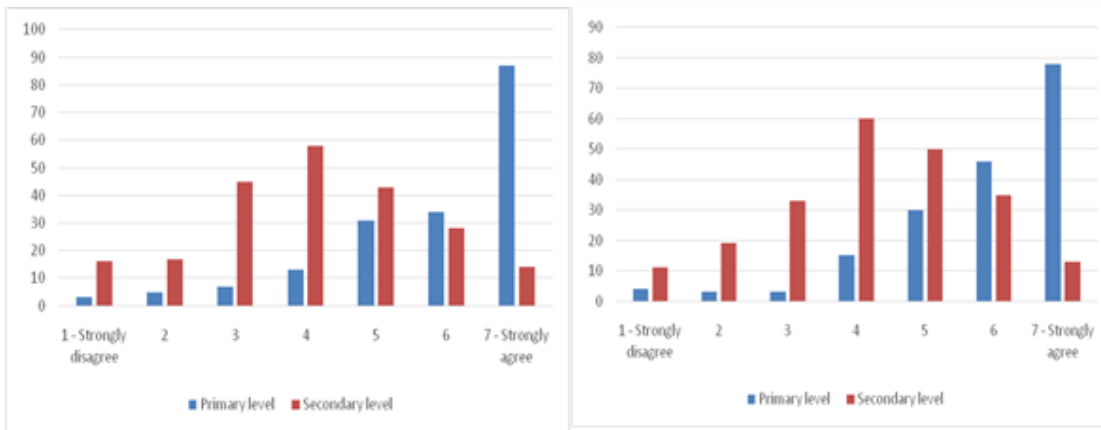


Chart 3.2. In school I have been thought how to think creatively and In schools I have been thought how to come up with ideas

Source: Research data

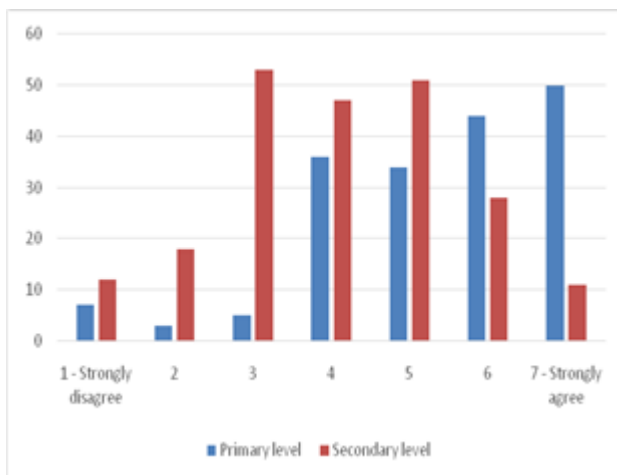


Chart 3.3. In school, I have been thought how to translate ideas into action

Source: Research data

Likewise, the research shows that primary school pupils believe that they have more enterprising than secondary school pupils (Table 3.1.). About 50% of the primary school pupils feel that teachers encourage them to do additional activities (*I feel that teachers encourage me to participate in extra activities*), as opposed to only 8% of the secondary school pupils. Only 3% of the secondary

school pupils feel that teachers listen to their ideas (*I feel that teachers listen to my ideas*), as opposed to 31% of the primary school pupils, and a small number of pupils of both primary and secondary schools feel that teachers believe it is all right to make mistakes (*I feel that teachers say it is all right to make mistakes*).

Table 3.1. Entrepreneurial teachers

	<i>I feel that teachers encourage me to participate in extra activities</i>		<i>I feel that teachers listen to my ideas</i>		<i>I feel that teachers say it is all right to make mistakes</i>	
	Primary level (%)	Secondary level (%)	Primary level (%)	Secondary level (%)	Primary level (%)	Secondary level (%)
1 - Strongly disagree	9.44	12.73	8.33	15.84	18.99	12.67
2	3.89	13.64	4.44	18.10	6.70	9.05
3	5.00	17.73	7.22	20.81	7.26	15.38
4	6.11	20.00	17.78	21.72	16.20	24.89
5	9.44	16.82	14.44	14.93	13.97	18.55
6	16.67	11.36	17.22	5.88	7.26	12.22
7 - Strongly agree	49.44	7.73	30.56	2.71	29.61	7.24

Source: Research data

As a result of more entrepreneurial teaching methods and more entrepreneurial teachers, we have got more creative primary school pupils than the other two groups of students (Chart 3.4.).

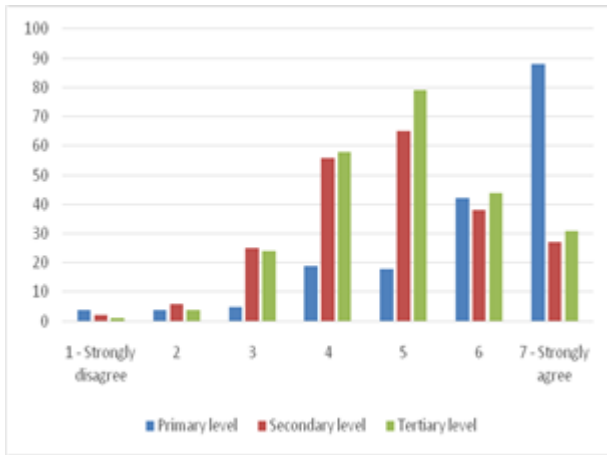


Chart 3.4. I am able to come up with new ideas  
Source: Research data

When we analyse entrepreneurial intentions of pupils and students (*My goal is to become my own boss/an entrepreneur*), we observe that most secondary school pupils do not see themselves as their own bossess, while (again) the highest number of the primary school pupils see themselves in this role (Chart 3.5.).

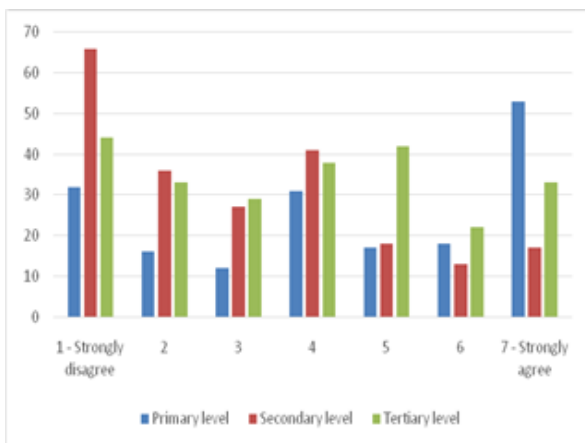


Chart 3.5. My goal is to become my own boss/an entrepreneur  
Source: Research data

Although, more than 80% of each group of students said that they would like (answers 5,6 and 7 on the scale) to have a job that allows them to work on their own ideas (Chart 3.5.).

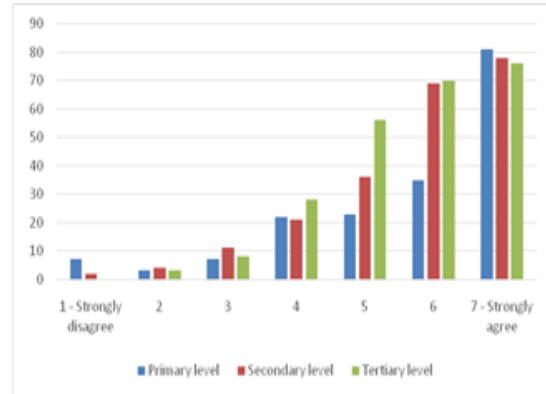


Chart 3.6. I would like to have a job that allows me to work on my own ideas  
Source: Research data

However, the majority of the respondents (51.07%) believe that starting a company is positive, while only 9% of all the respondents consider it negative (Table 3.2.).

Table 3.2. In general, starting a business is...

	Primary level %	Secondary level %	Tertiary level %	(All respondents) %
1 - Negative	11.95	7.01	8.90	9.03
2	3.14	3.27	6.36	4.43
3	4.40	5.14	5.93	5.25
4	14.47	21.03	15.68	17.24
5	10.69	14.02	13.56	12.97
6	14.47	20.56	22.88	19.87
7 - Positive	40.88	28.97	26.69	31.20

Source: Research data

#### 4. CONCLUSION AND SUGGESTIONS FOR FURTHER RESEARCH

The need for entrepreneurial activity and behaviour in all aspects of society is becoming more and more pronounced where education is crucial for the creation of an entrepreneurial society and entrepreneurial culture. Entrepreneurship education has a positive influence on the development of entrepreneurial spirit of young people, their intentions towards starting their own business, their employability and, ultimately, their role in society and economy. Although the importance of entrepreneurship education is almost universally accepted, there are numerous problems in measuring the impact of such education.

The ASTEE project (Assessment Tools and Indicators for Entrepreneurial Education) was created with the main objective of developing a set of common European tools for measuring the impact of entrepreneurship education on students' entrepreneurial competences across all education levels (primary, secondary and tertiary). The research has been carried out in 13 countries, questioning a total of 6,488 students across all education levels. As a result of ASTEE project the tools were developed and it has been shown that measures are reliable and that they are the valid measures of entrepreneurial behavior of students at all three educational levels.

The pilot study in Croatia (within the project) was carried out in primary and secondary schools and faculties in the city of Osijek (since the J.J. Strossmayer University of Osijek was the partner in the project). A total of 644 pupils and students from all three educational levels were surveyed.

The results of the research on this convenience sample have shown that

education does not stimulate development of entrepreneurial mindset, nor entrepreneurial skills, especially at the secondary level, and that teaching methods that develop these skills and encourage entrepreneurial thinking in pupils are not used. This study confirms the well-known statement that formal education stifles creativity in children, and that it (creativity) is greatly reduced as education progresses. Although this is a convenience sample on a very narrow geographical area, which cannot be used as the basis for making general conclusions, this study has nevertheless indicated some interesting facts, and it encourages further thinking, discussion and research. It would be interesting to see whether responses and attitudes of primary and secondary school pupils and students from other parts of Croatia differ, and which schools in Croatia educate "the most enterprising" pupils. How much and in what ways are we different in relation to European education? Likewise, the study confirms that the role of teachers in developing enterprising persons is crucial and that it is also important to invest into education of teachers, because it cannot be expected that they are going to implement new teaching methods and techniques on their own. Creating enterprising individuals and enterprising society cannot be left to individual initiative of teachers or pupils; it must be built into educational strategies and policies of every society. Only in that way can we get from education what we expect from it – creation of self-confident individuals, who are able to contribute to the development of the society in which they live and work.

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