

## FACTORS OF THE INNOVATION DEVELOPMENT IN SCHOOL

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### **Abstract:**

This paper presents findings on the work of enterprise circles and the current state of Slovenian primary schools in respect of the promotion of creativity, innovation and enterprise. It examines those factors within schools and the broader local environment that can promote or hinder the development of creativity, innovation and enterprise among pupils. The objectives are clarified by research approaches that connect empirical data to those social circumstances that affect how the issue is understood and how stakeholders explain it. The findings indicate a lack of awareness of how important it is to create links between the education system and the labour market.

*Keywords: primary school, enterprise circles, head teachers, pupils, innovation*

## 1. INTRODUCTION

In 2011 alone, Slovenia fell 12 places on the Global Competitiveness Index ranking (Global Competitiveness Report, 2011) one of the steepest falls of any country listed. Even though it is listed as an innovation-driven economy, Slovenia lags significantly behind most other innovation-driven economies in terms of the innovation sophistication factor, as well as in the quality of the education system. This has exposed a lack of adequate strategies and policies to improve the situation, and has focused attention on the education system for young people, which needs to be made more open and more relevant to life. The need for broader-based and more ambitious innovation policies and entrepreneurial action among young people is today written into numerous European and global documents (Ferrari et al., 2009). Emphasis is being placed on this more than ever before; this is because creativity and innovation are, and will remain, drivers of social development (Florida, 2002). Educational institutions do not have influence over the business environment, nor do they have the resources necessary for developing enterprise. Despite this, they can encourage young people to think about and understand the connections between individual elements of the micro and macro levels of enterprise. They can teach them creative and innovative patterns of behaviour, and support them in acquiring experiences in that field. Creativity and innovation cannot be taught: what creativity requires is a suitable environment that promotes the formation of new ideas, curiosity and innovation (Burke, 2007, Chell et al., 2009). If we wish to promote the development of innovation and enterprise, then school work cannot be separated from the local community and the production process. Of course, encouraging pupils to develop new ideas is only an initial step. Good ideas must also be developed, made tangible and put into practice – and perhaps one day also marketed (Likar et al., 2004). This involves pupils attempting to pass creative ideas along the entire invention and innovation chain to the point where useful results are produced that might also be of interest to others (Garavan et al., 1994).

Companies and organisations are also aware of this, since they understand that in order to be innovative in the environment in which they operate, they need the support of the local community to provide sufficient incentives and entrepreneurial challenges to allow young people to form their ideas into projects that relate to various fields of life within that local community. At the same time, companies that invest in youth innovation are aware that these young people represent potential future recruits. It would be unfair to claim that Slovenian schools do not have ideas; they certainly do have organised external initiatives to develop creative and innovative processes among pupils. Despite this, the findings of the Mladina 2010 research project (Lavrič, 2010) indicate that young people are conscious of the specific shortcomings of the educational system in this area.

A project took place in eight Slovenian regions in 2010 and 2011 to promote creativity, innovation and enterprise among young people, organised by the Slovenian Chamber of Trades and Small Businesses<sup>1</sup>. The purpose of the two-year project was to train teacher-mentors, who would then train pupils and run projects with them and with local community representatives (entrepreneurs, innovators, etc.) in 'enterprise circles'. The overall plan was based on a classic concept of innovation and enterprise development. Outside collaborators and teachers of other disciplines were involved as the project stage demanded. As part of the project, the authors evaluated the work of the enterprise circles and made an assessment of the state of creativity and innovation promotion within Slovenian primary schools. The authors were interested in finding out which factors within the school and broader local environment promoted or hindered the development of creativity and innovation. This included the positions taken by headteachers, teachers and pupils in relation to creativity and innovation, and the level of quality of provision of innovative teaching within the narrower school environment and the consequent promotion of creative learning processes.

## 2. METHODS

The objectives of the evaluation were as follows:

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- to determine the level of cooperation between schools, institutions and individuals, and to identify those factors that promote or hinder the development of creativity, innovation and enterprise among primary school pupils.
- to determine which factors and people encouraged pupils to create new ideas.

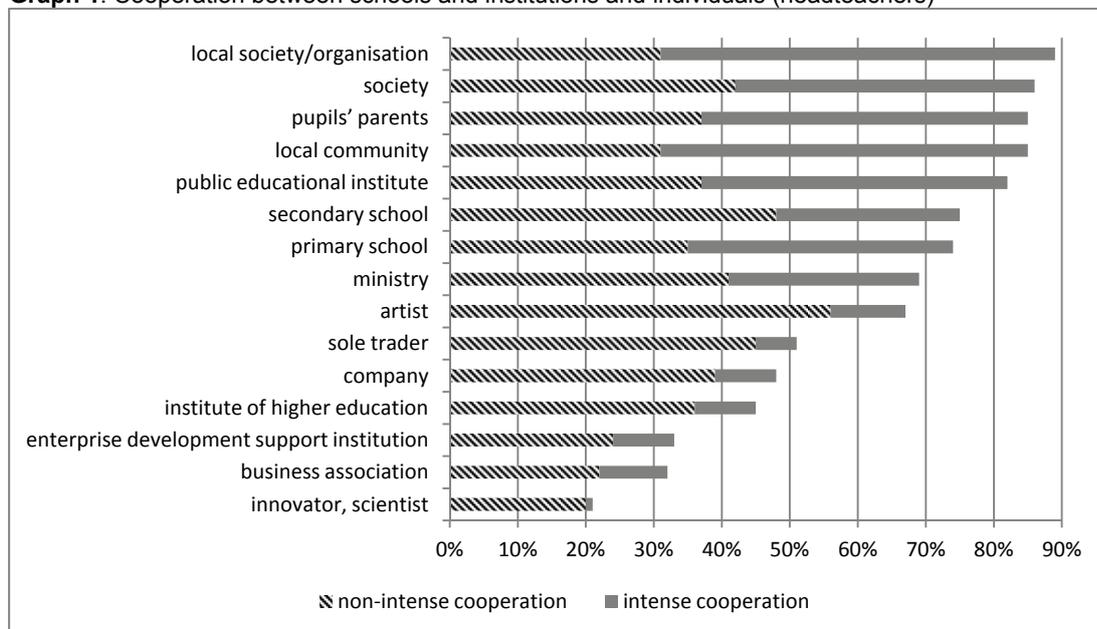
The first objective was tested by researching the opinions of primary school headteachers. A total of 153 headteachers participated in the study via an online questionnaire (Chell et al., 2009, Cankar et al., 2013). The aim was to identify those factors that promoted or hindered pupil creativity, innovation and enterprise and to determine the level of cooperation existing between schools and institutions and individuals from the local environment. Once the empirical research results were known, interviews were organised with five headteachers and five entrepreneurs to supplement the empirical findings. The data was processed to provide descriptive and comparative analyses. The responses from headteachers and external collaborators gathered from the interviews are described in the results section. Only the responses that best define the research problem have been selected.

The second objective covered testing pupils' views on which factors and people encouraged them to produce new ideas. A printed questionnaire was used for this purpose. The study included 190 pupils from the third primary education stage who had participated in the one-year training offered by the enterprise circles. There were 81 boys and 108 girls, with one respondent not stating their sex. Pupils from 19 primary schools were surveyed. Most of the pupils were from the eighth year/grade (89), followed by the seventh year (75), with a smaller proportion from the ninth year (26). The data was processed to provide descriptive and comparative analyses. Once the results had been gathered, a group was selected from two schools and the members of each group were interviewed individually. The aim was to identify the reasons why pupils found teaching in school less stimulating than the enterprise circles for the formation of new ideas.

### 3. RESULTS

The results are presented separately for each group of participants. They are set out by individual objective and presented via tables, graphs and diary entries. The first objective included a study of the level and intensity of cooperation between schools and other institutions and individuals to promote creativity and innovation (Graph 1).

**Graph 1:** Cooperation between schools and institutions and individuals (headteachers)

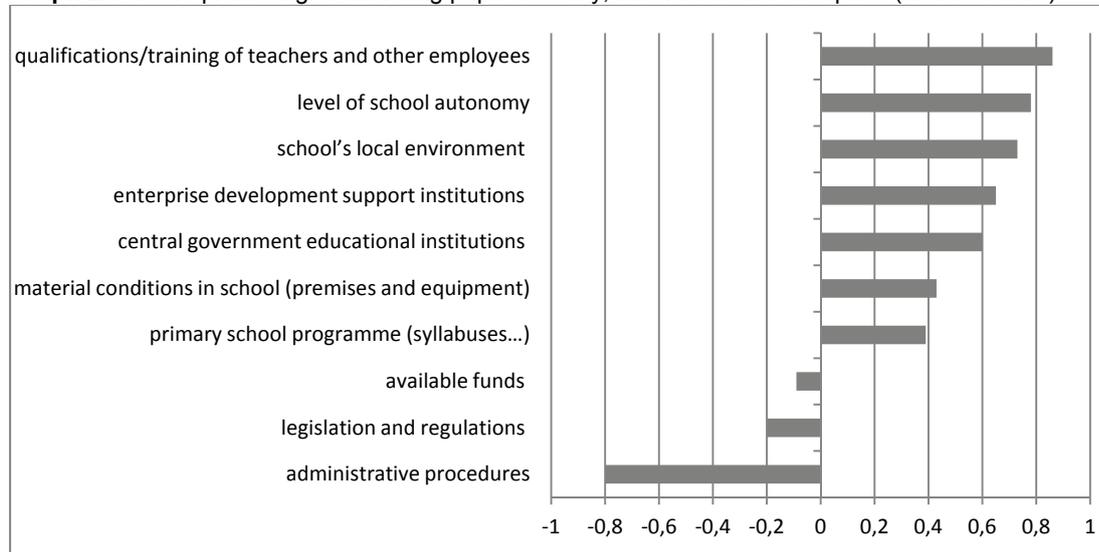


The findings indicate that over 85% of schools collaborated with local societies and organisations involved in sport, culture, tourism and other activities at the local level. The collaboration was regarded as 'intense' for over half those schools that did work with such institutions. The picture is very different when one looks at cooperation between schools and the business environment. Between 60 and 80% of schools did not create links with innovators, sole traders, companies, business associations or

institutions engaged in the promotion of enterprise development within the broader environment. If they did cooperate with such institutions, the cooperation was not particularly intense.

The factors that promote or hinder pupil creativity and innovation in terms of the school as a whole (Graph 2) were also presented. These factors were scored on a five-point scale, with a value of -2 meaning that the factor was a major hindrance and a value of 2 meaning that the factor was very encouraging (i.e. a very good source of promotion).

**Graph 2:** Factors promoting or hindering pupil creativity, innovation and enterprise (headteachers)



Headteachers considered young people's creativity and innovation to be encouraged most as a result of the level of training of a school's teachers (average: 0.86). This was followed by the level of school autonomy, the local environment of the school, enterprise development support institutions, central government educational institutions, the material conditions of the school, and the primary school curriculum. The factors headteachers ranked as the main hindrances were, in first place, administrative procedures, with an average score of -0.80. All the factors checked are statistically significantly different (at the 0.001 level) from 0 (higher or lower), with the single exception of available funds, which one cannot unequivocally state to be a hindrance to the development of pupil creativity, innovation and enterprise (significance in a two-sided t-test in that case was 0.349).

To investigate the reasons for poor cooperation between schools and business, interviews were organised with headteachers and entrepreneurs to supplement the empirical findings. The interviewee statements that best defined the research problem were as follows:

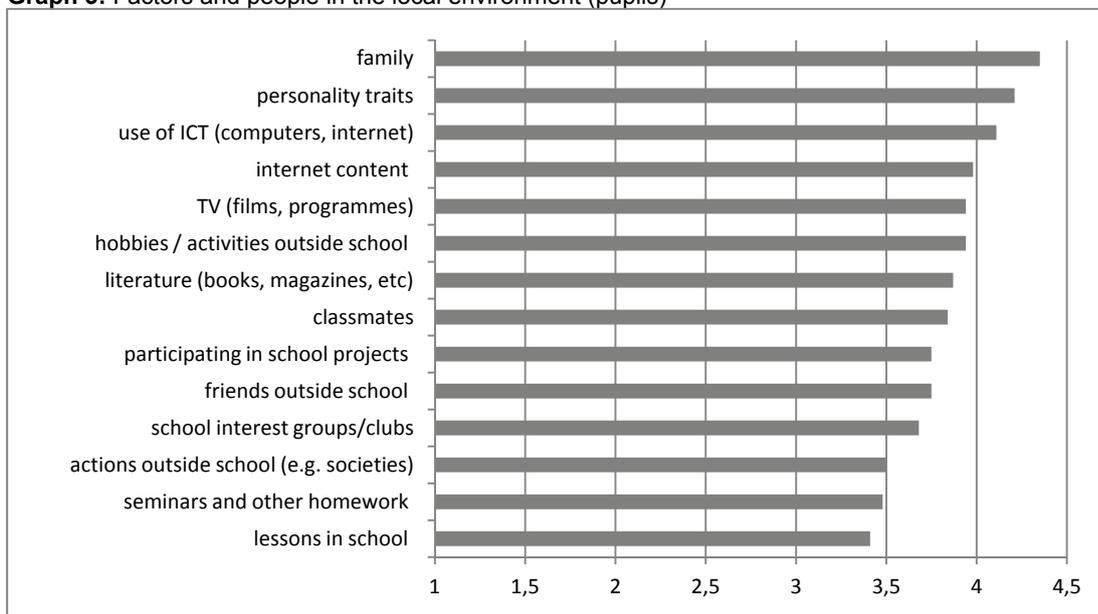
**Table 1:** Headteacher and entrepreneur responses (headteachers, entrepreneurs)

Headteachers	Entrepreneurs
1. Do you cooperate with the business environment (or with schools)? If so, what does this cooperation consist of?	
<p>'We cooperate to a small extent with the business environment. We occasionally receive invitations (from Gea College, JAPTI and others) to various competitions linked to innovation and enterprise, but these competitions are not of great interest to us.' (headteacher of a city school)</p> <p>'We would like to take part in such projects, which would offer theoretical and practical insights into developing creativity, innovation and enterprise, but we don't know how to start. Some examples of best practice would help us a lot.' (headteacher of a city school)</p>	<p>'Local schools don't invite us, but we'd like to take part.' (entrepreneur)</p> <p>'We cooperate with local schools, most often as donors. Schools visit us occasionally, and we present our work to them. We present our production, then pupils do presentations based on that. We are usually invited to schools' end-of-year presentations.' (entrepreneur)</p>
2. If you do not cooperate with the business environment or with schools, what are the reasons for not cooperating?	

<p>'Cooperation between schools and the business environment doesn't have enough emphasis in education documents, so it isn't one of the school's main challenges.' (<i>headteacher of a rural school</i>)</p> <p>'Teachers are overworked inside and outside the classroom. Any more work just represents an additional burden.' (<i>headteacher of a city school</i>)</p> <p>'Most teachers do not feel the need for that kind of cooperation, nor are they aware of how to cooperate with businesses.' (<i>headteacher of a rural school</i>)</p>	<p>'Local schools have their own issues to deal with and are not particularly interested in our work.' (entrepreneur)</p> <p>'We don't have time to deal with the organisation and all the rest of the things schools want. We have enough on with our own financial and organisational problems.' (entrepreneur)</p>
<p>3. What should be done to strengthen cooperation between schools and the business environment?</p>	
<p>'It would be good if business people came forward with ideas for cooperation. Teachers would be happy to respond and cooperate in seminars, round tables or projects.' (<i>headteacher of a city school</i>)</p> <p>'If activities took place in school, more teachers and pupils could take part.' (<i>headteacher of a rural school</i>)</p>	<p>'I think schools should be more aware of the importance of practical experience of work.' (entrepreneur)</p> <p>'There is a need for greater openness between schools and businesses.' (entrepreneur)</p> <p>'Cooperation could be more developed if those in charge of schools decided that it should be so.' (entrepreneur)</p>

The reasons given by interviewees illustrated the gap in cooperation between schools and business representatives. For the second objective, the responses given by pupils (Graph 3) are given; pupils scored individual factors and people using a five-point scale, with a score of 1 meaning 'did not help at all' and 5 meaning 'helped a great deal'. Although headteachers stated that teachers were the most important factor in promoting innovation in school, the picture was different from the pupils' point of view.

**Graph 3:** Factors and people in the local environment (pupils)



Taking the factors above, the highest contribution to developing new ideas came from the family (average score: 4.35), personality traits (average: 4.21) and ICT use (average: 4.11), and the lowest came from lessons in school (average: 3.41), and seminars and other homework (average: 3.48). When asked why school lessons were least effective in promoting the development of new ideas, pupils had the following to say:

- Work in the enterprise circle was interesting and different to lessons. In lessons, the teachers usually talk, while we just listen and repeat. Some teachers get annoyed if we ask too many questions. A while ago, our group was given an assignment in class to do a

presentation on India. When we wanted to present the project in a slightly more innovative way, the teacher told us there wasn't enough time. He only wanted us to present the basic characteristics of the country (Group 1).

- In lessons, we study individual subject areas in a lot of detail, but we don't have many opportunities to do practical work. In the enterprise circle, we gave a film presentation for classmates and local residents. We got to know and linked together a lot of different types of content, and at the end we organised everything and implemented the project in practice (Group 2).

#### 4. DISCUSSION

In linking schools with institutions and individuals that promote student creativity and innovation, cooperation with local societies and organisations is of greatest importance, and it is encouraging to note that the headteachers surveyed agreed with this. This means that the centre of the work moves towards the community, with the decision-making taking place there. Despite the variety and breadth of cooperation between Slovenian primary schools and the local environment, the question is whether and how much these forms of cooperation promote and develop innovation and enterprise among young people. The doubt is justified, since the actual level of cooperation between schools and the business environment presents a very different picture. A large majority of schools do not seek connections or link up with innovators, sole traders, companies, business associations or institutions engaged in promoting enterprise development in the broader environment.

An analysis of interviews with headteachers and entrepreneurs, designed to provide further clarification of the circumstances behind the weak cooperation between schools and the business environment, indicates two broad causes. First, there is noticeable pressure on schools and they lack the know-how or ability to connect with businesses in the broader community. Second, there is noticeable lack of initiative and responsiveness on the part of the business environment, which still does not seek links with schools nor invite them to work with them. Moreover, entrepreneurs and others are often preoccupied with their own organisational and financial problems. Schools, as institutions, live a rather self-sufficient life – they do not feel the need to open up and keep pace with current trends in life in Slovenia. There is a lack of awareness of how important it is to connect the education system to the labour market.

It is not surprising that headteachers ranked trained teachers as the most important factor in promoting innovation in schools (Krogh et al., 2000). Teachers are in contact with pupils on a daily basis and know that, for each solution, there are many potential paths leading to the objective. The question is whether and to what extent teachers are also aware of the added value that a creative and innovative educational approach offers. Do they put that into everyday practice and, if so, how? Observations indicate that in some places there is a lack of awareness about this, leading to a failure to put such ideas into practice.

The next important factor promoting the development of creativity and innovation is the level of autonomy enjoyed by the school; Shapiro and Helms (2011) even consider autonomy to be a key factor in the institutional development of innovation. How it is enacted within school management is important and includes the question of the extent to which teachers, as professionals, exercise their right to professional judgement, how autonomous each school is, how schools and teachers understand autonomy, and whether they are ready to accept and exercise it as part of their responsibilities. The fact is that Slovenian schools are today restricted by numerous administrative regulations that directly or indirectly regulate the educational system (Cerar, 2011) and make the educational process too bureaucratic. This restricts teachers' exercise of 'executive power' and frequently prevents them from taking the right decisions and expressing an amount of freedom sufficient to enable them to provide a high-quality educational process.

The third important factor promoting innovation in schools is the local environment. The current tougher business conditions require local communities and regions to increase their competitiveness; this means that they also have to address their own development potential and have an appropriate development policy in place. They cannot just wait and count on assistance from the state, which – given the many problems it faces at the macro-level – is increasingly hard-pressed to address local problems, notwithstanding the fact that its tasks include using an improved development policy to encourage companies to grow and progress.

One factor that can undoubtedly act to promote or hinder innovation among young people is the school curriculum, and its implementation in particular (Gotvassli, 2008). This raises many questions, one of the main ones being how teachers understand knowledge and how they communicate this to pupils. This is something that comes exclusively from them – they are facilitators of knowledge and they decide what is right and what is not. This leads to ‘closed’ lessons and a rigid ranking of pupils according to ability that is unable to promote the development of pupils’ creativity. ‘Open’ lessons of this kind are essential to the development of pupil creativity and can only be realised in direct contact with pupils, which means that what goes on in the classroom is vital.

Among the factors that headteachers ranked as the greatest hindrances to the development of innovation were excessive administration and educational legislation. This is because one of the main, if not the fundamental, weakness of the Slovenian school system is rigidity or an ‘industrial model of thinking’ that excludes flexibility and innovation. Teachers can only operate as executors of something that is precisely defined ‘from above’. This wastes time and energy and damages teachers’ authority, at the same time nullifying teachers’ professional functions and responsibilities.

Finally, the authors were also interested in identifying those factors or people that encouraged pupils to generate new ideas. Pupils believed that the main contributions to this came from their families, their own personality traits and the use of ICT, with lessons at school, seminars or other homework making the lowest contribution. Pupil criticism of school lessons is not surprising: clearly it is still difficult for pupils to express themselves in non-standard ways within the school system. Lessons separated into different subjects and restricted by the school timetable do not offer them sufficient challenges when it comes to expressing creativity and innovation. This does not mean that school is too difficult, but that it obviously has too much of ‘something’ that leads to resistance from pupils and gives them a feeling of being over-burdened. This ‘something’ is an excessive quantity of data and information and the method used to communicate it (Robinson, 2010, Musek Lešnik, 2011). Today’s pupils are no different to those of decades ago; however, the world in which we live and in which they will grow up has changed, which means that schools must adapt to this changed world.

## 5. CONCLUSION

The findings suggest that the participation of schools and the local community in the promotion of creativity and innovation is influenced by a web of social circumstances linked to the experiences of the partners involved. A majority of schools fail to make sound contacts and connections with innovators, sole traders, companies, business associations and institutions engaged in promoting enterprise development within the broader environment. The findings indicate a lack of awareness of the importance of linking the education system to the labour market. Headteachers ranked trained teachers, school autonomy, the local environment and the curriculum as the most important factors promoting innovation in schools. Among the factors ranked as the greatest hindrances to the development of innovation were excessive administration and educational legislation. Pupils believed that the main contributions came from their families, their own personality traits and the use of ICT, with lessons at school, seminars or other homework making the lowest contribution. It is clearly still difficult for pupils to express themselves in non-standard ways within the school system.

Although enterprise circles are a welcome form of promoting innovation and enterprise within schools, in terms of seeking sustainable solutions, theory and practice are already moving beyond them. At the heart of new developments are approaches that emphasise creative problem-solving among young people, which is a universally applicable skill, as well as being the essence of entrepreneurial thought and action. Despite the many restrictions placed on putting educational innovation into practice in schools, it is encouraging to note that major changes in schools are coinciding with significant changes in social, economic and political trends in society and institutions. In future, the development of the individual and their lifelong learning skills will be emphasised, along with training to increase added value and the flexibility of the labour market.

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