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Discovering Perceptions about and the Potential Demand for Unique, S.T.E.A.M. Educational Programs for Children in Osijek, Croatia

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**Discovering Perceptions about and the Potential
Demand for Unique, S.T.E.A.M. Educational
Programs for Children in Osijek, Croatia**

By

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A Capstone Project Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Science in Service Leadership and
Innovation

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Abstract

S.T.E.A.M. (Science, Technology, Engineering, Art and Mathematics) as a topic has been explored in terms of adding the arts as a basis for creativity, creative making, divergent thinking and in relation to innovation (Ghanbari, 2014). In addition, a connection between arts and future leadership might have been made by previous researchers. Moreover, S.T.E.A.M. has been researched in terms of ethical framework and demand related to education. This research paper investigated the perceptions about and the potential demand for unique, S.T.E.A.M. educational programs for children from five to ten years old, in Osijek, Croatia. Past studies regarding the implementation of program, innovation in education and unexplored demand were used to investigate the market potential. A number of factors helped in understanding the demand, but emerging trends within the local community, the uniqueness of the experience itself and innovation on the market played a pivotal role. Although past studies have explored the association between education and future of work, a concrete theoretical framework was now used. Thus, using Constructivist approach, this qualitative study with qualitative design, attempted to discover the preferences and whether the parent's interest in extracurricular education through play and experiments is becoming a trend. The study was conducted using interviews and focus group. Data was collected from multi-disciplinary innovators and parents of children attending Helen Doron Early English school. Data obtained through a two-phased research was analyzed, coded and grouped according to predetermined themes associated with research questions. However, limitations were identified to be considered by future researchers.

Table of Contents

Abstract.....	3
Introduction.....	5
Problem Statement.....	6
Problem Significance.....	7
Literature Review.....	8
Literature Gaps.....	13
Methodology.....	13
Approach.....	13
Qualitative Research Questions and The Use of Theory.....	15
Role of the Researcher.....	17
Data Collection Period	17
Qualitative Data Collection.....	17
Data Analysis.....	18
Research Sample, Site and Participants.....	22
Procedure and Results.....	25
Limitations.....	33
Validity and Reliability.....	36
Conclusion and Recommendations.....	44
References.....	49
Appendix A – Research Questions.....	54
Appendix B – Research Results and Coding Process.....	56

Introduction

This research proposal was used to investigate if there is a growing opportunity for diversification of education for children on the Osijek's market. The research explored the attitudes about and the demand for a new startup named Tinker Labs and sponsored by private owners Ante Mate Orlic and Tijana Orlic. The owner's credibility is their past and present experience as franchise owners of Helen Doron Early English Education program in Osijek. The parent company Bubelina d.o.o is the owner of the Helen Doron franchise in Osijek and would be master franchise and the owner of the Tinker Labs program. The Tinker Labs S.T.E.A.M. educational programs would operate outside of the Croatian Ministry of Education and would have no affiliation with government policy and would be solely financed by the owners and European Union small business funds for regional development, innovation, research and commercialization.

Adding Arts to S.T.E.M. (Science, Technology, Engineering and Mathematics) equation could help prepare children for work and continued education. In addition, S.T.E.A.M. education could produce more divergent future workers and creative problem solvers that can deal with a fast changing world, bring innovation and technological leadership (Arrieta, 2015). The rationale for this research project was to investigate the potential demand for unique, S.T.E.A.M. educational programs that would encourage children to learn about local Osijek's community and the planet in general. In particular, this research paper was focused on researching the attitudes about and the demand for unique educational programs, in private Tinker Lab school, which is also a master franchiser of non-traditional courses for small children, on Osijek's market. The research was performed for a private company Bubelina d.o.o. where the researcher

volunteers as a business developer. Since the research findings showed that attitudes are positive and that there is the potential demand for two programs, Tinker Town and Tinker Planet, the unique education will be introduced to the market in Osijek. Introducing the unique private school's program on Osijek's market will help diversify the current product offering of extracurricular education for children. This research proposal also investigated whether offering more variety of children's education through play would also increase children's learning experience. The main research question explored what are the attitudes about and what is the demand for unique, S.T.E.A.M. educational programs in Osijek, Croatia. Research sub-questions researched if innovators from different fields and educators think there is a market potential for new S.T.E.A.M. educational programs in Osijek and they investigated their perceptions about them. Moreover, research sub-questions explored whether there is a gap between current educational programs and S.T.E.A.M. educational programs, in terms of successful adults' ability to think creatively. Literature was studied to determine emerging trends in education and if those trends and innovations include innovation in the delivery of education.

Problem Statement

The purpose of this qualitative study was to discover the perceptions about and the potential demand for unique educational S.T.E.A.M programs in Osijek, Croatia. Programs are targeted towards children in age groups from five to seven and from seven to ten. At this stage in the research, the unique educational Tinker Labs programs are defined as education through play and experiments, with the purpose of inspiring children to become interested in various disciplines, self-motivated and creative thinkers. In particular, children in age group from five to seven would learn about Osijek and its culture, through experiments and play in "Tinker Town" educational program. Children from seven to ten would learn about the world, different cultures

and universe in “Tinker Planet” educational program. Disciplines of interest are science, technology, education, entrepreneurship, arts and mathematics.

Problem Significance

The purpose of this research was to broaden the understanding of perceptions and attitudes about existing and new educational programs and to identify the potential demand for the unique, new S.T.E.A.M. educational Tinker Labs programs in Osijek, Croatia. Research questions were used to discover parents’, innovators and educators’ perception about children’s education through qualitative instruments. In particular, innovators from different disciplines were interviewed to determine their perceptions about changes needed in education and new emerging trends on the market. In addition, parents were questioned to investigate their perceptions regarding what changes are needed in education so that children can think creatively and be creative later in life. The concept of Tinker Labs programs’ authenticity and credibility was examined through empirical research. Moreover, potential clients’ criteria and opinion of local innovators was taken into consideration to investigate the opportunity for creating new demand in uncontested Osijek’s marketplace. This research also considered education through play and experiments, challenges in education’s innovation, non-traditional teaching methods and past educational research findings that support and argument against innovation in children’s education (Van Oers, 2013).

Literature Review

The literature review presented the previous research about S.T.E.A.M educational programs, the benefits of adding art to science, technology, engineering and mathematics, the S.T.E.A.M.

Charter private schools in the United States, the funding for adding arts to the S.T.E.M. equation, the innovation patterns, the concepts about developing independence and self-initiative in children based on the Montessori method and education through play and storytelling.

All of these areas were presented so that the reader can understand the advantages and uniqueness of Tinker Labs' S.T.E.A.M. programs. In addition, this literature review gave insight into the unexplored market demand and the nature of the Osijek's market in terms of entry costs and industry.

From S.T.E.M. To S.T.E.A.M.

Due to a need for employers to create a more innovative workplace, the integration of arts in the traditional STEM programs' curriculum was studied and advocated for (Rabalais, 2014). Previous researchers found that many arguments against integrating arts have political basis and are made due to funding challenges, but many arguments for including arts have empirical support. Adding Arts to Science, Technology, Engineering and Math equation could improve creativity, collaboration, risk-taking and exploration by students (Rabalais, 2014).

According to Ge (2015), utilization of S.T.E.A.M. activities in a classroom would result in students' greater understanding associated with them using their hands more often. Also, incorporating arts into S.T.E.M. education would result in more interactive classes that could be more effective for students. Ge (2015) also argued that the activities used by teachers should be S.T.E.A.M. centric and could use augmented reality technology (AR) technology in the context of theory and to enhance the students' learning experience. Liberal arts could also benefit from connecting to principles of S.T.E.A.M. education because the risks are low and future of liberal arts themselves may be at risk. In addition, S.T.E.A.M. could be transferred to students in a form

or laboratory unique to a specific area, situation and context, have an inquiry-based model of learning and encourage teachers to take risks (Armknrecht, 2015).

S.T.E.A.M. education has a potential to provide students and educators with a chance to make connections between materials, design, society and the natural environment (Sochacka, Guyotte & Walther, 2016). Moreover, students with skills and knowledge in science, technology, engineering, art and mathematics will drive the future economic development and art will serve an imperative for students to think creatively, critically and collaboratively (Gastas, 2013).

S.T.E.A.M. and Storytelling

Storytelling can be used as one of the best strategies to increase the student engagement in a classroom (Morris, 2015). Previous researchers have proved that using storytelling to teach S.T.E.A.M. education to non-S.T.E.A.M. majors have resulted in high levels of student engagement, higher absorbency of content knowledge and a higher perception of instructor's effectiveness (Morris, 2015).

Moreover, STEAM teachers who use storytelling as a teaching strategy could stimulate the imagination and creativity of their students (Morris, 2015). Storytelling is effective because it may help students to connect the class material to their own life-experiences and it may further tackle their imagination within a context for discovery and inquiry (Morris, 2015).

Also, teachers that use storytelling are role models to students because they are demonstrating their use of imagination, creativity and innovation in teaching. Consequently, teachers are encouraging students to be innovative, imaginative and creative leads to a better engagement, better preparedness for future careers and bigger professional success (Morris, 2015).

Innovation is Built on Merging Arts and Sciences

Today, many institutions, corporations and individuals recognize that 21st century innovation will come from encouraging creativity and design thinking in K20 education (Michaud, 2014).

Children in S.T.E.A.M. classrooms learn without even knowing by encountering overlapping content, making connections across disciplines and using critical thinking skills (Michaud, 2014). They also participate in critiques of their work that encourages them to think beyond aesthetics and engage in creative and collaborative inquiry with their peers and teacher.

Also, there are some common innovation patterns with S.T.E.A.M. schools that instill a collaborative culture (Michaud, 2014). Moreover, when students learn how others interpret their work, they are learning how to better present their ideas and communicate messages they wish to send more effectively.

S.T.E.A.M. Funding

Even though there are still a lot more opportunities for S.T.E.M. funding, in comparison to S.T.E.A.M. funding, the continued growth in funding for programs that include arts is evident. For example, the Department of Education in the United States has a program which offers 1 million dollars to elementary schools that “combine math and science with the arts” (Ge, 2015).

K-12 Charter Schools and Ethical Framework

It seems that there is a big rise in charter and private school programs that include arts in S.T.E.M. According to Dyer, Gregersen and Christensen (2011), there is also a big dissatisfaction with K-12 education due to asking wrong questions. Instead of asking what is wrong with the current school programs, a serious consideration should be given to the real

reasons why children are in school. Perhaps, children want to make friends and be involved, not only become educated. By giving special attention to the reasons why children go to school and their emotional needs, Rhode Island School of Design (RISD) designed a special curriculum in their MET charter school. The main idea of curriculum is that children learn together through projects and elements of Montessori, that provide “hands on” interactive learning experiences. (Dyer, Gregerson & Christensen, 2011). The takeoff from MET charter school is to carefully investigate the social and emotional needs of students and construct programs in which students develop skills as they work on projects, without even realizing they are interactively learning. Therefore, in constructing school programs, it is crucial to look beyond the functional dimension, and investigate social and emotional dimensions (Dyer et al., 2011).

Understanding The Montessori Approach

Isaacs (2013) argues that Montessori considered that children from six to twelve are at the stage of a child’s development which is the calmest and the most productive. Children from six to twelve embrace their social lives with a new productive energy and with a need to belong to a certain group. Not only that children are exceptionally curious, but they also exercise their morality and belonging to a group. In order to reflect children’s growing intellectual abilities, teachers that use Montessori method, divide the group from six to twelve in two different sub-groups: from six to nine and from nine to twelve.

Based on the Montessori Method, education should concern itself with development of individuality and independence of children through all stages of their development (Isaacs, 2012). Through the Montessori approach, children are approached individually, learn actively and they are free within certain limits in order to learn how to be responsible as they mature. In

terms of encouraging creativity through movement, children are exposed to broad areas such as arts, crafts, music, storytelling and books and creativity itself are linked to Montessori creative and physical development.

Development of Creative Skills from Kindergarten

According to Yalcin (2015), the development of creative thinking skills should start in kindergarten, where children should be encouraged to imagine, create, recognize, and share knowledge and practice. It is important that children construct perceptual, conceptual and analytical viewpoints from a young age because they are at the root of creativity. Friedrich Froebel opened his first kindergarten in 1837 and enriched it with objects that children can use for building, creating and designing (Yalcin, 2015). In addition, children could set a building foundation for design from an early age through play and experiments in kindergartens. Moreover, Yalcin (2015) argues that children's artistic development occurs between 2 and 6 years of age and creative work of children at that age is filled with vitality that diminishes over time.

The Unexplored S.T.E.A.M. Market Demand in Osijek

Once the most developed in Croatia due to its geographical position and its natural resources, Eastern region is now one of the least developed regions in the Republic of Croatia. However, due to market opening and a disappearance of traditional labor intensive industries due to the war, there is a need for change in thinking and encouragement of self-employment (Mesaric, Franjkovic, Sebalj, 2014). Recently, IT industry achieved big successes in Osijek, the biggest city in Eastern region, due to low entry costs, huge revenues and unlimited market demand.

Literature Gaps

Gaps that persist throughout the literature in regards to unique, educational S.T.E.A.M. private school programs and the particular market in Osijek were wide and varied. For instance, there was simply a lack of S.T.E.A.M. private school programs that are widely accepted and a lack of market research related to adding arts to sciences and research related arts benefits. Moreover, there were no past studies that are related to S.T.E.A.M. educational programs on Osijek's market or in Croatia. There were too many varied research about preparing students for the future of work worldwide and researchers/authors paint generalization about a significantly large population sample fitting into different categories. Another issue with literature was that it was not clear how to objectively compare results of students enrolled in S.T.E.M. and S.T.E.A.M. programs and whether traditional S.T.E.M. programs should be taken as a basis of needed education fields when predicting the future of work. Also, there was an issue with little research about innovation patterns in education. The challenge associated with this study was also that there was no data related to competition, no local awareness about the meaning of S.T.E.A.M. acronym and history behind it. Literature also consisted of data and empirical knowledge coming from different continents and cultures.

Methodology

Approach

The philosophical approach to this study was the Constructivist worldview. A qualitative design was proposed to determine the perceptions and attitudes about, and the potential demand for unique educational S.T.E.A.M. programs in Osijek, Croatia. Qualitative design was used and the researcher discovered the educators' and innovators' perceptions about

S.T.E.A.M. educational programs from multiple perspectives, kept a focus on learning the meaning that the participants hold about the current educational programs and on what is needed for successful individuals to be creative, addressed the research to obtain that information and reflected on her role (Creswell, 2014). Moreover, qualitative design was used because data was collected at participants' natural settings, researcher collected data herself and this was a qualitative study in which theory was the end point. The inductive process to gather detailed information about participants and then form this information into categories and themes was used (Creswell, 2014). In terms of subject, this study focused on a S.T.E.A.M. educational programs, a topic that has never been addressed in research focused on Osijek, Croatia. Also, the topic has never been addressed and investigated based on a specific and a convenience sample of educators and innovators in Osijek, which was another reason why qualitative research was used (Creswell, 2014). Moreover, an existing theory did not apply with a particular sample and researcher therefore used qualitative research design. The perceptions about the new, unique educational programs had the essence in teachers', innovators' and parents' experience and in their attitudes toward it. The researcher's findings were derived from convenience samples and participants' perceptions about current educational programs and S.T.E.A.M. programs and about the potential demand for S.T.E.A.M. programs on Osijek's market. Through the use of both interviews and focus group, the researcher sought to investigate whether there was a gap between current educational programs and new S.T.E.A.M. Educational programs. This research study explored the innovators', educators' and parents' perceptions, attitudes and emotions and placed special emphasis on how things were experienced by those involved in the education of young children (Denscombe, 2014). This study also sought to show the multiple realities concerning innovation in private education, through detailed research findings.

Qualitative Research Questions

The central research question was:

1. What are the perceptions about unique S.T.E.A.M. Educational programs in Osijek, Croatia?

The associated sub-questions were:

- 1a. What do you as a parent think are the gaps between current educational programs and new S.T.E.A.M. educational programs, in terms of what is needed for successful adults to be creative?
- 1b. What do you as an innovator think are the gaps between current educational programs and the new S.T.E.A.M. educational programs, in terms of what is needed for successful adults to be creative?

The central research question aimed to find out the perceptions about and the potential demand for Tinker Labs educational programs based on a focus groups and interviews' findings.

The first sub-question aimed at parents to find out more about their perceptions about current educational programs in comparison to S.T.E.A.M. programs and to explore the gaps between them. Also, the first sub-question sought to discover parent's thoughts on what is needed for successful adults to be creative, through a focus group research.

The second sub-question aimed at educators and innovators to find out more about their perceptions about current educational programs in comparison to S.T.E.A.M. programs. The second sub-question also discovered their thoughts on what is needed for successful adults to be creative, through interviews.

The Use of Theory

This research proposal did not employ any explicit theory because the inquirer built the essence of the experience from participants and constructed a rich, detailed description of their perceptions after the research was conducted (Creswell, 2014). As applied to this study, the absence of theoretical lenses held that educators, innovators and parents provided information about their preferences and the potential demand to describe the phenomenon of new educational programs in Osijek, Croatia. For the purpose of this phenomenological study, the absence of the theory was explained up-front.

Role of the Researcher

Throughout this study, the researcher was involved in a sustained and intensive experience of interviewing participants and conducting a focus group. The researcher was also involved in the development of the Tinker Labs educational program in Osijek, Croatia on voluntary employment basis. The researcher had a positive attitude towards Tinker Labs and considered that there is a need for new educational programs in Osijek's market. The researcher's background in marketing, openness to change and previous work experience as a business developer in Silicon Valley may have also impacted this study. Participants were informed that the researcher is affiliated with the Tinker Labs program and they may have displayed overly enthusiastic or masked attitudes toward it. The researcher's potential employment was tied to the opening of the Tinker Labs center in Osijek and researcher may have leaned towards a positive outcome of research results and towards making positive conclusions. Moreover, the researcher hoped that Osijek market would prosper and that many businesses would open so that the city economy improves. However, researcher verified that the results were indeed based solely on the

participants' feedback and the verification procedure was explained in a separate section of this research proposal. The researcher also added all research findings to the Appendix B to allow for other researchers to explore them in detail. Moreover, the researcher did not collect data from other potential employees at Tinker Labs to avoid jeopardizing the roles of the researcher and the roles of the participants.

Procedure - Data Collection Period

Qualitative data was collected for a period of three months, from August to November 2016.

Qualitative Data Collection

Qualitative data was collected through a multi-pronged approach beginning with six interviews of multi-disciplinary innovators that sought to investigate their thoughts about the program and the market demand in Osijek, followed by one focus group that sought to investigate the preferences and thoughts about the program of eight parents whose children attend Helen Doron Early English courses. The research order was determined based on the availability of the research site. The nine sample interview and seven focus group questions are located in The Appendix A and they were used to investigate answers to the main research question and research sub-questions. All qualitative data was collected in Croatian, added to the Appendix B in original form and translated to English for further analysis. However, if certain exceptions were made and if interviewees wished to be interviewed in English and could speak it well, the interviews were conducted in English.

Data Analysis

Data collected in two phases of this study was coded, analyzed and grouped by predetermined groups developed based on research questions. The procedure for analyzing interviews and focus group was the same, with minor changes in letter coding to help diversify the data. First, the three main groups, “Perceptions about unique S.T.E.A.M. educational programs”, “Gaps between current and unique S.T.E.A.M. programs in Osijek, Croatia” and “Thoughts on Creativity (what is needed to become successful adults)”, each with three possible outcomes, were constructed to answer the main research question and sub-questions, separately for interviews and focus group. The reason why the procedure was performed separately is the researcher’s initial use of different questions for interviews and focus group. Thus, questions were determined to fit different groups. The possible outcomes for the first group “Perceptions about unique S.T.E.A.M. educational programs” were “Positive”, “Negative” or “Does Not Apply” and different code groups that correspond to interviewee’s and focus group participants’ answers were added to outcomes, based on their meaning. The possible outcomes for the second group “Gaps between current and unique S.T.E.A.M. programs in Osijek, Croatia were “Yes”, “No” or “Does Not Apply” and they are matched to sample insights the same way as in the previous group. The possible outcomes for the third group “Thoughts on Creativity...” were “It’s is related to children’s experiments and play”, “It is not related to children’s experiments and play” and “Does Not Apply” and coding process for the third group was performed the same way as for the previous two groups. Second, the meanings of the interviewees’ and focus group’s participants’ answers were interpreted and each answer was labeled with a specific lower case or upper case letter and a different color to help distinguish them. Interviewees’ answers were labeled with lower case letters in the alphabetical order from a to f. Focus group answers were

labeled with upper case letters in the alphabetical order from A to H. Third, each answer was assigned to one of the groups and its outcome, based on answer's meaning. Answers that best respond to a specific category were added to it and labeled with a distinct letter and color that matched the original interview and focus group answer script in the Appendix B.

Both interviews and focus group were conducted by the same facilitator to maintain the consistency over the data collection. Specific interview and focus group questions were designed for each and used to ensure that the central research questions and sub-questions were truly investigated.

The sample used for the interview part of this research proposal was first reached via email, on the behalf of Josip Bartic, one of the members of the Association of Innovators in Osijek. He provided members' email addresses and introduced the researcher to potential interviewees. The researcher reached out to ten potential interviewees via e-mail and offered incentives for partnership with Tinker Labs, if they choose to participate. Six interview participants agreed to participate and accepted the incentives for possible collaboration and partnership in developing educational programs. Even though the normal protocol for interviewing is not to disclose the interviewees' details, members of the Association of Innovators in Osijek insisted that their identities are revealed. The advantage of disclosing identities is this research resulted in more transparent and credible findings because the members of the Association of Innovators play important roles in encouraging creativity and entrepreneurship in Osijek, Croatia. The other advantage of interviewing members of the Association of Innovators in Osijek is that all interviewees came from different disciplines and have different perspective about effective education for children, based on their education and professional experience. The following

Table 1 represents the interviewees' details, which are highlighted in blue in research results and also included in the Appendix B.

Table 1

“Diversification of Interviewees”

Interviewee	Background / Education:	Gender	Age	Language
Jovica Hardi	An innovator in food technology and full-time professor	Male	60	Croatian
Krunoslav Weinpert	An innovator and entrepreneur in tourism	Male	44	Croatian
Josip Bartulić	An innovator in engineering	Male	26	English
Sabina Harambašić	Montessori teacher in early education	Female	31	English
Matijas Knežević	An innovator in economics	Male	20	English
Ivan Jelušić	An innovator in engineering	Male	25	English

The convenience sample of innovators and educators used was also aged from twenty to sixty which added more value to results because interviewees were different age generations. The participants also had to previously meet the requirement to participate which was either to be an innovator in the diverse industry or a teacher. The researcher made sure that the diverse background prerequisite was met prior to an interview, through e-mail communication. The other prerequisite met is that all interviewees were members of the Association of Innovators in Osijek. The sample used was also diversified based on gender and based on the language in which the interview was originally conducted in, Croatian or English. The table above also adds

more validity to this research and it is intended to help other researchers to expand on this research, using the same or different criterion for selection of interviewees.

The following Table 2 represents the focus group's participants sample and the criteria based on which the sample will be diversified. The table is also located in the Appendix B and matched to the original answer script in which answers were highlighted with blue color.

Table 2

“Diversification of Focus Group Participants”

Name:	Age:	Income Level:	Occupation:
Bojana Šimac	39	Above Average	Marketing Manager
Martina Vulin	37	Above Average	Doctor of Medicine
Melita Marić	40	Average	Soldier
Brankica Sardelić	38	Above Average	Fashion Designer
Melita Polić	37	Above Average	Doctor of Medicine
Šatvar Nina	38	Above Average	Lawyer
Eva Barišić	38	Above Average	Cook
Sunčica Novak	35	Above Average	Lawyer

The focus group participants were contacted by the researcher through email. The emails, information about age, income level and occupation were taken out of the database of parents whose children are currently attending or will attend courses at Helen Doron Early English Center in Osijek. Only participants that have different occupations, are different age, have different income levels and are parents of children five to ten years old were chosen to participate in the focus group. The researcher used the help of Helen Doron Early English Center's owners to find out the information about the age of parents' children. The owners of Helen Doron Early English Center in Osijek also personally invited parents to participate in the research by calling them on the phone. The discounts for Tinker Labs programs were offered as incentives and eight female parents that answered the phone calls and e-mails agreed to

participate in the focus group. The researcher purposefully asked the owner to call only female parents to add more gender diversification to this research, since the majority of interviewees were male innovators. The focus group was also diversified based on the average or above average income to help researcher to draw conclusions when analyzing research results.

Different occupations of participants were marketing manager, doctor of medicine, lawyer, cook and soldier. Participants' diverse occupations added more value to focus group because the researcher assumed their perspectives on education and creativity was different. All female participants were also educated working mothers that may also provide readers with the perspective of working mothers on children's education and creativity. Moreover, the sample was diversified based on the age and participants were from thirty five to forty years old. Even though the normal protocol is not to include the participants' names, participants insisted to be included in the research. The advantage of including the participants' names is that it adds more credibility to focus groups results because their identities can be checked. Not only that readers now know who are the participants that agreed to share their insights, but also future researchers can use the information about their identities to find out more about them.

Research Site, Sample, Participants - Interviews

The first phase of this study was conducting six interviews in total. This study focused on convenience sample of interview participants and may not generally apply to the entire population of innovators, only to those affiliated with the "Association of Innovators" in Osijek.

The interviews lasted fifteen minutes each and were conducted in-person, one-on-one and face-to-face. Semi-structured interviews consisted of a few open-ended questions prepared in

advance which allowed for new ideas to be brought by from participants. According to Creswell (2014), interviews provide indirect information filtered through the views of interviewees.

Osijek is the place where the potential demand is investigated. Interviews were conducted separately from the focus group and took place in the Innovators Center in Osijek. The researcher interviewed only innovators that are members of the association and she acknowledged that the majority of the sample were males, which was also stated in the limitations. In addition, all educators and innovators that were included in the interviews were screened and needed to have a background in different disciplines to allow for variability in the views and perspectives about education and educational practices for young children. Specifically, the interview participants were the following innovators, educators and members of “Udruga Inovatarstva“ or the “Association of Innovators“: Josip Bartulic, Prof. Dr. Jovica Hardi, entrepreneurs Matias Knežević, Ivan Jelušić and Krunoslav Weinpert. Moreover, the interview participant was Sabrina Harambašić, a member with an expertise in Montessori approach and with an experience in traditional pedagogy used for teaching in public kindergartens and elementary schools in Osijek, Croatia.

Some of the main questions asked were: “What do you think about Tinker Labs educational programs?“, “How would you describe the demand and supply for educational programs for children in Osijek?“ and “What do you think about demand and supply for children’s programs in Osijek?“ and “What are the emerging market trends you experienced or you are aware of?“. The interview protocol for asking questions and recording answers was prepared in advance to answer research questions and sub-questions, used and included the following components: a heading, the questions, probes, spaces between the questions to record responses, a final thank-

you statement or e-mail and a log on Google Docs to keep documents collected for analysis (Creswell, 2014). The detailed outcome of the answers will be added to the Appendix B.

Research Site, Sample, Participants - Focus Group

The second phase of this research was conducting a one focus group consisting of an eight parents in total. In terms of the participant selection process, the focus group was an invite-only and pre-arranged by the researcher or facilitator. The researcher used convenience samples for the purpose of this research and results may not apply to the entire population of female parents living in Osijek.

The focus group started after the initial demonstration of the program, it lasted forty-five minutes and it consisted of eight female parents. The number of a focus group participants and the number of interviewees was established based on Creswell's argument that a focus group should consist of approximately eight participants and very few questions that could elicit specific views and opinions (Creswell, 2014). Sample focus group questions can be found in Appendix A. Some of the main questions were: “Does your child enjoy learning?”, “Where and how does your child learn best?”, “What do you think about learning through play and experiments?”, “What are you doing to prepare your child for the future of work?” and “How should education for children look like?”. The detailed outcome of answers is located in the Appendix B.

Moreover, the focus group took a place at parent Tinker Labs company Bubelina D.O.O. In Osijek in the designated room for “Tinker Labs” educational program.

A diverse sample of participants was a mix of middle and high income level female parents. The sample used was also a convenience sample that involved “Friends of friends” of Helen

Doron Early English Center's owners. The researcher also aimed to invite only parents of children that are in the age group from five to ten. Moreover, the researcher asked the owners to help determine the children age of female parents in the Helen Doron database before inviting them to participate. The sample was diversified prior to the invitation to the focus group, in terms of women's age, occupation and based on their income level. The women's income level was determined based on the following criteria: the middle income women will be considered as those that earn an average Croatian salary in the amount of 5673.00 kunas (Državni Zavod za statistiku, 2016) and the women that earn more than the average Croatian salary will be categorized as high-income group. The information about the female parents' income level was found in the Helen Doron database prior to reaching out to potential participants.

Procedure and Results - Interviews

The interviews were sound recorded and the researcher handwrote the notes in case equipment (audio and computer) failed at the research site. The interview protocol included the following components: a heading with a date on which the interview was conducted, probes to follow-up and encourage interviewees to explain their ideas in more detail, spaces between questions to record responses, a final-thank you statement for participants and a log on Google Docs to keep a record of documents collected for analysis. At the beginning of each interview, interviewees were asked to provide the information about their education and background, age, gender and were asked whether they want to be interviewed in Croatian or in English. The researcher asked the same nine questions during each fifteen minute interview to explore innovators and educators insight into the main research question and sub-questions. In terms of results, they were first grouped based on the predetermined groups (1., 2. and 3.) to give an insight and answers to the main research question and research sub-questions. The

answers were grouped to explore innovators' perceptions, gaps between current and new S.T.E.A.M. educational programs and thoughts on creativity. Each of those groups had three different possible outcomes or sub-groups where researcher easily and quickly arranged answers based on their meaning. The answers about the innovator's perceptions about the S.T.E.A.M. programs were divided into three different outcomes: "Positive", "Negative" or "Does Not Apply (DNA)". The innovators' answers that related to the gaps between the current and new programs were assigned to "Yes", "No" or "Does Not Apply" outcome (DNA), depending on their meaning. Answers were only assigned to one possible group and its outcome to avoid the confusion in data analysis. Innovators thoughts on creativity and whether children's creativity is related to the experiments and play were divided into three outcomes or sub-groups: "Related", "Unrelated" and "Does Not Apply (DNA)". Finally, the interview findings were presented in qualitative narrative with detailed description of the most important findings, determined by the researcher. A detailed outline of the "Manual Coding Process for Interviews" and its results were presented in the Appendix B and the coding process was included below. The interviewees were diversified based on gender, age, background, and based on the language in which the interview was conducted. The interviewees' diversification is visually presented in the previous section of this research proposal and in the Appendix B.

Procedure and Results - Focus Group

The focus group answers were also sound recorded, hand-typed and analyzed for the insight into the preferences by looking at their meaning and by assigning them into predetermined groups. The specific date on which the focus group took place, settings, ice-breaker questions at the beginning and probes to follow-up and elaborate on answers were used for the focus group

protocol. In addition to an audio recording by smartphone, the answers were hand-typed on the computer by the facilitator and spaces between the questions to record responses were prepared in advance. Groups were predetermined, equal to the predetermined groups for interviews and presented in the Appendix B in the Manual Coding Results section. The focus group answers or results were first assigned to the predetermined groups (1., 2. and 3.) to give an insight and answers to the main research question and research sub-questions. The three groups were set up by the researcher to investigate parent's perceptions about the unique S.T.E.A.M. educational programs, whether they think there are gaps between the current and new educational programs and to capture their thoughts about the creativity and how experiments and play connect to it. Each of those groups had three different outcomes to save the researcher's time ("Positive", "Negative", "DNA or "Yes", "No", "DNA" or "Related", "Unrelated", "DNA"). The conclusion of this focus group research part conveys the findings of the analysis from multiple female parents' perspectives about new educational program in narrative form that will be presented by the researcher. The lessons from the focus groups were interpreted from the researcher's point of view and used to make strategic decisions for Tinker Labs start-up. The focus group participants were diversified based on age, income level and occupation and the diversification is visually represented in the Appendix B and in the Data Procedure section of this research proposal.

Data Coding and Results

The complete manual coding process performed for interviews and focus group, followed by the narratives, was presented in the Appendix B. The researcher first identified three main groups that aimed to provide more insight about research questions based on the research results. Second, the researcher predetermined three possible outcomes for each of those groups. Third,

the researcher first analyzed all interview results and looked for meaning of questions that would provide good answers to each group. To ensure the proper data analysis process was used for qualitative data, the researcher made predetermined groups and fit the data in them (Creswell, 2014).

For the interviews, the researcher determined that interview questions 2, 3, 5, 7 and their answers best investigate the “Perceptions about the unique S.T.E.A.M. programs” group and assigned them to outcomes: “Positive”, “Negative” or “Does Not Apply”, based on their meaning and using specific codes. The researcher labeled interviewees’ answers with numbers in ascending order, with a lower case letter codes from a to f and with distinct colors or bold. All interviewee’s answers to questions 2, 3, 5, 7 were analyzed, coded and codes were assigned to predetermined groups outlined below and in the Appendix B. The same data analysis procedure was repeated with questions 2, 3, 4, 5, 8 and 9 whose answers were assigned to group “Gaps between current and S.T.E.A.M. programs” and distributed based on their meaning into the following sub-groups “Yes”, “No” or “Does Not Apply”. Last, the same procedure was repeated for the question on creativity and interview questions 4, 5, 6, 7 and 8 were assigned to “Thoughts on Creativity” group. A specific lowercase letter and a specific color correspond to a specific interviewee. For example, **1a** and all other black bolded code groups that consist of bolded and black lower case letters “**a**” correspond to Jovica Hardi’s interview. More specifically, the code **1a** corresponds to Jovica Hardi’s answer on the question 1: “the experiments are the best way because children can immediately see how something works and they are like sensors”, located in the narrative and in research results in Appendix B. Answers were also grouped in the ascending order, meaning that number 1 corresponds to answer on question 1 located in the Appendix B and so on. The entire six lists of nine different codes each

that were used for labeling each interviewee's answers and for matching them to groups in the outline below is the following: **1a, 2a, 3a, 4a, 5a, 6a, 7a, 8a** and **9a** that correspond to answers in Jovica Hardi's interview, **1b, 2b, 3b, 4b, 5b, 6b, 7b, 8b** and **9b** that correspond to answers in Krunoslav Weinpert's interview, **1c, 2c, 3c, 4c, 5c, 6c, 7c, 8c** and **9c** that correspond to answers in Josip Bartulić's interview, **1d, 2d, 3d, 4d, 5d, 7d, 8d** and **9d** that correspond to answers in Sabrina Harambašić interview, **1e, 2e, 3e, 4e, 5e, 6e, 7e, 8e**, and **9e** that correspond to Matijas Knežević interview and **1f, 2f, 3f, 4f, 5f, 6f, 7f, 8f** and **9f** that correspond to Ivan Jelušić interview. In addition to different lettering, numbering and coloring of codes, some of the were also bolded for the easier visibility purpose. The total number of codes used in manual coding of interviews' data is fifty four. The six lists correspond to the number of interviewees and nine codes in each list corresponds to the number of interview answers by each interviewee.

Outline for Interviews

“Manual Coding Results - Innovators Based On Interviews”

The following manual coding results and narrative are based on and correspond to the answers below them.

The Manual Coding Results

1. Perceptions about unique S.T.E.A.M. Educational programs:

Positive: **1a, 1b, 1c, 1d, 2a, 2d, 1e, 9e, 1f, 6f, 9c, 9d, 6e**

Negative:

DNA (Does Not Apply): **2e, 2f, 9a**

Questions: 1, 2, 6, 9

2. Gaps between current and unique S.T.E.A.M. Programs in Osijek, Croatia

Yes: **3a, 2b, 3b, 8b, 3c, 4c, 3d, 4d, 3e, 5d, 4f, 9f, 5e**

No:

DNA (Does Not Apply): **4a**, **2c**, **3f**, **9b**, **4e**

Questions: 2, 3, 4, 5, 8, 9

3. Thoughts on Creativity (what is needed to become successful adults):

Related (It is related to children's experiments and/or play): **5a**, **6a**, **8a**, **5b**, **7b**, **5c**, **6c**, **7d**, **8d**, **8e**, **9e**

Unrelated (It is not related to children's experiments and/or play):

DNA (Does Not Apply): **7a**, **4b**, **6b**, **6d**, **7e**, **8f**, **7c**, **8c**, **5f**, **7f**

Questions: 4, 5, 6, 7, 8

The researcher manually coded the interviewee's answers and grouped them using a computer and Microsoft Word program. Interview results above were labeled with the lower case letters and focus group answers located in the outline below were labeled with capital letters to avoid the confusion.

The entire data coding process performed for interviews was repeated in the same way for the focus group, with minor exceptions. The first exception was in the procedure of assigning different questions to different groups due to their different wording and nature. The other exception was using uppercase letters for focus group participants' answers and outline. In the focus group coding process, data were assigned to groups using different colors and letter codes that correspond to the number of questions. The letter codes for focus group were assigned in the alphabetical order from A to H. The researcher also determined which focus group questions and answers best correspond to which research questions and grouped only meaningful participants' answers into groups. Moreover, the researcher determined that answers to focus group questions 2, 3, 5 and 7 correspond to the group "Perceptions about unique S.T.E.A.M. educational

programs” and use only answers to those questions in further analysis. The same procedure was performed with a second group “Gaps between current and new S.T.E.A.M. programs” where answers to questions 2, 3, 5, 6 and 7 were assigned, and with the third group “Thoughts on Creativity“ where answers to questions 1, 2, 4, 6 and 7 were assigned. Despite the fact that some answers to questions were intended to fit into the first or second group, all answers were grouped only into one group's outcome, depending on their meaning.

The researcher saved time and preserved the quality of the original results by assigning the entire answers to groups, using numbers, colors and letters labeling. All answers were added to predetermined groups and questions that best corresponded to groups are the basis for conclusions. A member checking through follow-up phone interviews to check on certain themes was used to ensure the validity of the study. For verification purposes, the researcher also examined the evidence from interviews and focus group and built coherent justification for predetermined themes (Creswell, 2014). The entire eight lists of seven different codes for each participant was matched to focus group participants’ answers and to outline below was the following: 1A, 2A, 3A, 4A, 5A, 6A and 7A that correspond to the Bojana Šimac’s answers in the same order, 1B, 2B, 3B, 4B, 5B, 6B and 7B that correspond to Martina Vulin’s answers, 1C, 2C, 3C, 4C, 5C, 6C and 7C that correspond to Melita Marić’s answers, 1D, 2D, 3D, 4D, 5D, 6D and 7D that correspond to Brankica Sardelić’s answers, 1E, 2E, 3E, 4E, 5E, 6E and 7E, 1F, 2F, 3F, 4F, 5F, 6F and 7F that correspond to Melita Polić’s answers, 1G, 2G, 3G, 4G, 5G, 6G and 7G that correspond to Šatvar Nina’s answers and 1H, 2H, 3H, 4H, 5H, 6H and 7H that correspond to Eva Barišić’s answers. The number of code lists corresponds to the number of focus group participants and the number of different codes in each lists corresponds to their answers to focus group questions.

Sunčica Novak

Outline for Focus Group

“Manual Coding Results - Parents Based on Focus Group”

The following focus group manual coding results and narrative are based on and correspond to the answers below them.

The Manual Coding Results

1. Perceptions about unique S.T.E.A.M. Educational programs:

Positive: 3A,

Negative: 3B, 5B, 3F, 7G, 7H

DNA (Does Not Apply): 3D, 3E, 5E, 5F, 3H

Questions: 2, 3, 5, 7

2. Gaps between current and unique S.T.E.A.M. Programs in Osijek, Croatia

Yes: 2F

No: 2C, 3C, 7E, 3G, 5G, 2H

DNA (Does Not Apply): 2A, 5A, 6B, 7B, 5C, 6C, 5D, 6D, 7D, 6F, 7F, 5H, 6H

Questions: 2, 3, 5, 6, 7

3. Thoughts on Creativity (what is needed to become successful adults):

Related (It is related to children’s experiments and/or play): 4A, 6A, 7A, 1B, 4B, 4C, 7C, 4D, 4E, 6E, 1F, 4G, 4H

Unrelated (It is not related to children’s experiments and/or play): 1A, 1C, 1D, 2D, 1E, 4F, 1G, 1H

DNA (Does Not Apply): 2B, 2E, 2G, 6G

Questions: 1, 2, 4, 6, 7

The bias that research brought to the study was clarified through a self-reflection in the researcher's role section. Finally, researcher described the narrative outcome of the research based on the research findings located in the Appendix B under "Manual Data Coding Results" sections, separately for interviews and focus group, and used it to decide whether to start with the Tinker Labs, S.T.E.A.M. Education private school in Osijek, Croatia.

Limitations

Limitations of Interviews

The limitations of interviews included:

1. The future business owner was involved in inviting the interviewees and his positive outlook might have affected the outcome of the interviews.
2. Interviews were conducted at "Udruga Inovatarsva" or the "Association of Innovators" in members / interviewees natural field settings, which is a form of open office for public.
3. Not all participants were equally articulate, perceptive and knowledgeable about the market demand in terms of education.
4. Participants might have been biased in responding due to their own field of interest, discipline or expertise.
5. Participants were might biased based on their own individual professional experiences and beliefs.
6. Each interview was limited in the time duration to fifteen minutes.
7. It was a convenience sample of interviewees and the results cannot be applied to the entire population.
8. The majority of the sample were male innovators.

9. The researcher presented a short introduction about Tinker Labs prior to each interview that might have influenced the interviewees' answers.
10. Participants were innovators themselves and might have been overly enthusiastic regarding new ideas.
11. Some of the interviewees chose to be interviewed in English, even though their native language is not English, but Croatian.
12. Interviewees might have been influenced by personal their negative experiences in Osijek.

Limitations of Focus Group

The limitations of a focus group included:

1. A researcher's presence might have biased responses.
2. Participants might did not share information with a diverse group of strangers.
3. Researcher's voluntary affiliation with Bubelina d.o.o. (The parent company of Tinker Labs and Helen Dolon Early English) might have biased responses.
4. The focus group took place in Bubelina d.o.o., in the designated space for Tinker Labs, not in participants' natural settings.
5. Parents and members of the focus group were affiliated with Helen Doron Early English Center in Osijek and may have been biased based on their affiliation and past experiences.
6. The focus group was time limited to forty-five minutes.
7. The focus group participants might have excluded important information due to the presence of other parents and the researcher.
8. It was a convenience sample of participants and the results cannot be applied to the entire population.

9. The entire focus group sample consisted of female parents.
10. The researcher presented a short introduction about Tinker Labs prior to the focus group discussion that might have influenced the participants' answers.
11. The parents whose children attend or will attend Helen Doron Early English school and who were focus group participants mostly have above-average income.

These limitations serve as a help to a future researcher for a further replication of the study by different entrepreneurs, souvenir investigators, at different geographical locations and by different facilitators. To minimize the impact of limitations, the researcher made a detailed record of all findings and went through the verification of the outcomes. Also, the researcher made sure that participants were comfortable with answering questions in a group of strangers and did let participants know that they do not have to participate if they do not want. Moreover, the researcher encouraged participants to speak their opinions openly explain them that their insights will be used solely for the purpose of this research paper. The researcher asked the participants do disregard her presence and affiliation with the business owners. Also, the interviewees and focus group participants were asked to turn off their phones and place their watches in purses or pockets, to minimize the time limitation distractions.

Participants were also asked to remain polite and to listen while others are talking and to raise their hand if they needed to leave the room. Focus group participants and interviewees were also asked to be quiet while others are talking or while the researcher was asking questions. Moreover, the researcher didn't interrupt the interviewees and focus group participants while they were responding to questions. During the focus group, the researcher asked questions and one parent at the time responded to all questions while other parents remained quiet, to prevent further unnecessary discussion unrelated to the topic and to be mindful of the time limit.

However, the researcher did let focus group participants decide on the order in which they are asked questions. The researcher did not interrupt the interview and focus group protocol to minimize distractions, but did let participants know they need to answer in a specific time limit. Interviews consisted of nine questions and each answer had to be given in less than two minutes, as explained by the researcher prior to beginning. Focus group consisted of seven questions and eight participants needed to answer each question in less than a minute, as explained by the researcher prior to the beginning.

Validity and Reliability

To ensure the qualitative validity of this research study, the researcher checked for the accuracy of the findings by using certain procedures such as member checking and by giving the final outline of groupings and participants' answers narratives back to interviewees and focus group participants (Creswell, 2014). Research participants received the outline with research results included in the Data Procedure section and its narrative included in the Appendix B and verified that their answers were properly grouped and that the outcome is accurate. The researcher also ensured that participants feel there is nothing additional to discuss and add to the research findings and gave them opportunity to discuss the findings in short five minute follow-up phone interview. To ensure the validity, the researcher also clarified the bias in the researcher's role in an honest and open way that resonates well with readers (Creswell, 2014). The researcher included the information about her education, experiences and affiliation with Tinker Labs start-up, as well as about her personal beliefs, to explain how are the research findings shaped.

To ensure qualitative reliability, researcher verified that her approach to research is consistent across different researchers (Creswell, 2014). Specifically, the researcher checked asked an

informant to check Word transcripts by listening to audio recordings of interviews and focus group, to make sure there are no mistakes in typing them. The researcher also asked the same informant to manually go through the research results in Word document to ensure that code names are matched properly to participants' answers and if they are assigned properly to groups' outcomes.

Results

Interviews

Based on the main research question which was: "What are the perceptions about unique S.T.E.A.M. Educational programs in Osijek, Croatia?", it seems that four out of the six innovators in the convenience sample have positive perceptions about the unique S.T.E.A.M. educational programs. The research sub-question: "What do you as an innovator think are the gaps between current educational programs and the new S.T.E.A.M. educational programs, in terms of what is needed for successful adults to be creative?" confirmed that four out of the six innovators understand that the gaps between current and new S.T.E.A.M. educational programs exist. It also seems that five out of the six innovators understand that the creativity (in terms of what is needed for children to become successful adults) is related to play and experiments. The results related to the interviewees' perceptions about the unique S.T.E.A.M. educational programs were that the experiments are the best way to educate children because they can immediately see how something works, memorize it and absorb it as sensors. Jovica Hardi shared the following thoughts about experiments: "The experiments are the best way because children can immediately see how something works and they are like sensors". Moreover, Josip Bartulic shared the following: "The experiments are the best way to educate kids because they can immediately see how something works and remember it for the rest of their lives." In

addition, results show that children enjoy learning “hands on and in a practical way”, as indicated by Sabina Harambasic and Jovica Hardi. Moreover, four out of six innovators and educators perceived that children need mentors with an experience that would teach them not to measure their abilities and quality of their ideas based on Osijek’s market, but instead to understand that the world is a big place and that their ideas might be successful elsewhere. More specifically, Krunoslav Weinpert shared the following thoughts: “children need mentors with an experience that would explain them not to measure their abilities and quality of their ideas based on Osijek’s market – the world is a big place. I teach my kids, since they were born, through travelling; I take them to world journeys so that they can better understand globalization. Children are aware of technologies and there are amazing possibilities for them, in this time where companies need to constantly change and adapt”. Interesting insights were that children should be taught through travelling and world journeys so that they can better understand globalization, as Krunoslav Weinpert explained. The majority of interviewees, five out of six, agreed that children are aware of technologies and more able to constantly change and adapt to adjust to market needs. Some suggestions interviewees provided were that S.T.E.A.M. educational programs should balance technological and other advances with the pricing of the program to “make it better and more affordable”, as indicated by Josip Bartulić. Moreover, the instruction should be offered in small groups and more individual approach should be provided to each child. Moreover, Sabrina Harambasic shared that new S.T.E.A.M. educational programs should: “offer instruction in small groups and more individual approach and satisfy different needs of each specific child. Next, make a program to offer something new, different and interesting so that kids can later benefit from in their future lives and spheres of their lives. “ The other important finding is that it seems that the personal motivation of the child “determines

what kind of individual he or she will become in future”, as indicated by Matias Knežević and Ivan Jelušić. The new S.T.E.A.M. educational programs should make sure that: “the atmosphere for kids is more creative and that kids independently make decisions“, which four out of six interviewees suggested. Moreover, children should always be asked for their opinion. The reasons why things are the way they are should be explained to children so that they can learn by questioning and understanding concepts. Also, Matis Knežević added that: “the atmosphere for kids should be more creative and that kids should independently make decisions. Kids should always be asked: “What do you think should be done? In any given situation. “ The perceptions about the S.T.E.A.M. educational programs were also that new S.T.E.A.M. educational programs can lead to innovation and that children should be taught to follow trends from a young age. Ivan Jelušić explained that: “kids need to be taught to follow trends and technology”. Research also suggests that children should learn to be creative, to find solutions outside of the box and to learn from their own failures.

In terms of the Osijek’s market, it seems that there is a lot of unused potential and that the culture of parents living there might be a problem, as Ivan Jelušić explained: “But, the culture is a problem because our parents still don’t understand their kids and don’t follow trends.” There is a support from the city of Osijek for educational programs, but not enough of it. In addition, the majority of parents are still skeptical about the new S.T.E.A.M. educational programs. However, it seems that there is a minority of parents in Osijek that would be interested in S.T.E.A.M. educational programs “...there is a minority that accepts changes which is enough.”

The majority of interviewees’ answers, four out of six, confirmed there is a gap between current and new educational programs in Osijek, Croatia and that current schools need to work more on making kids familiar with market and trends. Based on the research results, it also

seems that there is nothing similar to Tinker Labs on the market. The other important fact is that six out of six interviewees' pointed out that Osijek is a family town. Moreover, Sabrina Harambašić explained that: "Osijek is a family town, where many families live to raise their children...".

An interesting insight is that interviewees do not blame teachers for not encouraging children to be creative, instead some of them, as Sabrina Harambašić, stated that: "teachers are underpaid." It also seems that the supply of educational programs on the market is very small, and the demand is very high. Krunoslav Weinpert indicated that: "Kids are forced to be in public school programs because they do not have a choice". Some interviewees believe that children should be immersed and "included in the process of creating curriculum" and they should be the ones to say what they actually need, as Sabrina Harambašić explained. Related to current Croatian public schools' programs, the research results suggest that: " Kids simply learn too much in school... In Croatian schools, kids need to memorize a lot of information and those wide subjects are for later (general education). Kids should have a habit of learning by doing, not a habit of learning by the hearth", as pointed out by Matias Knežević. In addition, research results reveal that children should also be allowed to make mistakes because making mistakes seems to be a great way to learn. Sabrina Harambašić shared the following thoughts about making mistakes: "kids should not be afraid to ask questions, to try and to loose".

The other important factor for the success of new S.T.E.A.M. educational programs seem to be its location in the center of the Osijek because that is where "where upper class parents live" that can afford additional programs for their children, as indicated by Ivan Jelusic.

The research results also confirmed that the creativity in adulthood is related to children's play and experiments. Some of the interviewees explained that children like to use their strong

senses in experiments and while they are playing. Moreover, Jovica Hardi explained that: “Kids have better senses, they recognize tastes, smells and hear everything. Also, kids have an extraordinary ability to pay attention to details.” and “kids always carry their toys in a way in which they grab them by the ear because they understand the gravity“. However, interviewees continued to state that the city and the county of Osijek should do more to support business and that there should be more funding for Osijek, as indicated by six out of eight interviewees. In terms of play, research results show that children learn best “if the program is of a good quality and if they are being thought through play“, as indicated by Jovica Hardi and Josip Bartulić. Research also revealed that children can develop divergent thinking and become involved in the surroundings and in the community through experiments and play, as explained by Sabrina Harambašić. Moreover, research suggested that children should do fun experiments and research what is trendy, as shared by Ivan Jelusic. Based on the research results, the emphasis of the new S.T.E.A.M. educational programs should be or already is on learning by doing, through play and experiments.

Research Results – Focus Group

The main research question which was: “What are the perceptions about unique S.T.E.A.M. Educational programs in Osijek, Croatia? “ and the research sub-question which was: “What do you as a parent think are the gaps between current educational programs and the new S.T.E.A.M. educational programs, in terms of what is needed for successful adults to be creative?” were investigated through this focus group research. Based on the research findings of the focus group, it seems that the majority of female parents, five out of eight from the convenience sample, has negative perceptions about the unique S.T.E.A.M. educational program. Moreover,

Martina Vulin shared that she is: “against putting a burden on children from a young age” and that it is: “still early to start preparing child that is 5 years old for the future of work”, Nina Šatvar indicated that: “There are many different programs, but I am not forcing my child“. The majority of female parents, five out of eight, answered the sub-question and it seems that they do not see gaps between current and new S.T.E.A.M. programs. More specifically, Melita Marić shared the following: “I did not search for anything else right now, he learns in kindergarten and enjoys spending time with grandmother, listen to her stories and watching what she is doing and he imitates her very well“, and “In Osijek there are not many programs and there is no choice, but every learning is good“. Brankica Sardelić shared that: “I am not really interested, mine goes to English in kindergarten that is well equipped, I consider that learning English is necessary for the future and they love it.“, Eva Barišić shared that: “They are still small, I am watching them how they enjoy doing hairstyles for each other, they both say they want to be hair stylists when they grow up, but we will see, there is still time until they grow up“. However, not seeing gaps between current and new educational S.T.E.A.M. programs might be due to parents not having enough information about the program differences and the future trends. Some parents also indicated that they did not search for any programs, that there is not much choice of different programs in Osijek. More specifically, Melita Marić shared that: “I did not search for anything else right now, he learns in kindergarten and enjoys spending time with grandmother, listen to her stories and watching what she is doing and he imitates her very well“ and Brankica Sardelić shared that: “I am not familiar with it, my child is going to school next year and he did not go to kindergarten“.

Three out of eight parents believe that their children are also still very young for such programs and that they change opinions very often. Melita Polić shared that: “For now I did not

recognize towards what predispositions he is leaning towards and I can't direct him yet toward any of them. For example, one moment he wants to be a baker and another moment he wants to fly to space“. Some parents also believe that learning in school and being involved in different extracurricular activities is sufficient for children's learning, either because children are too busy or because parents are simply satisfied with the current educational programs. Moreover, Melita Marić also shared that: “For now he learns through play, but we will see in future towards where will their capabilities lean, when they grow up they will change with the years, like all of us. I do not have time to talk with other parents about it and it is too early for that kind of subjects“ and Eva Barišić shared that her children are: “still small, I am watching them how they enjoy doing hairstyles for each other, they both say they want to be hair stylists when they grow up, but we will see, there is still time until they grow up“.

It seems that many female parents think of S.T.E.A.M. educational programs as something that would put an additional pressure on their busy children: “I think educational programs for children are good, but I am against putting a burden on children from a young age.”, as shared by Martina Vulin, and “Kids should not be overloaded and we should not exaggerate with expectations, and as they say everything in its time“, as shared by Šatvar Nina.

However, it seems that the majority of female parents, seven out of eight, understand that the creativity is related to play and experiments. Moreover, Melita Polić answered that her child learns best through play: “Through play and through developing his imagination“ and Martina Vulin shared that her child learns: “Mainly through play.“ Also, parents believe that children are getting an education and preparation for the future when they are playing and experimenting. Research results also suggest that play helps children to develop their imagination which can help them to better prepare themselves for the future. Research also shows that parents still don't

understand much about their children's capabilities and that they somehow believe that S.T.E.A.M. educational programs are all about developing the children's most powerful capabilities and preparing them for the future. Sunčica Novak shared that: “Personally, I do not want to look into the future too much, everything changes very fast“ and .Melita Polić shared that: “For now I did not recognize towards what predispositions he is leaning towards and I can't direct him yet toward any of them“. Interestingly, research results show that children also learn the best through listening and imitating grownups when playing and through speech and listening to stories.

Conclusion

Based on the main research question that sought to investigate the preferences about and the potential demand for the new S.T.E.A.M. educational programs and the sub-questions explored if the gaps between current and new S.T.E.A.M. educational programs exist, certain findings can be determined. The convenience samples of mostly male innovators and female parents was used to determine that the majority of them understands that the creativity (in terms of what is needed for children to become successful adults) is related to play and experiments. It seems that based on this research study, seven out of eight female parents that participated in the focus group and four out of six participants in the interviews, understand that the creativity needed in adulthood is connected to children's play and experiments. As indicated by Sabrina Harambašić in her interview, new S.T.E.A.M. educational programs: “should teach children to find solutions outside of the box, to practice how to find solutions to new problems, and how to constructively solve problems to deal with failures and to learn to be persistent and not quit.“ It seems that the creativity and play could therefore be used to most effectively and clearly present the new S.T.E.A.M. educational programs on Osijek's market. However, it is also important to consider

that children may already have too many obligations and that parents are worried about putting an additional burden on them with another program. Based on the research results, the new current S.T.E.A.M. educational programs' competitive advantage on the market might be the fun factor that both innovators and parents believe to be crucial to the success and enjoyment of children in the program. Perhaps, instead of putting much emphasis on the future of work, new S.T.E.A.M. educational programs focus could be placing less burden on children and creating an atmosphere in which children would be transformed into creative thinkers through play. One of the female parents and focus group participants, Šatvar Nina, suggested that education should be: "Interesting, training and education need to be interesting for children, and not too tiresome."

However, it is recommended that future researchers and entrepreneurs further research the potential benefits of new S.T.E.A.M. educational programs for children that would help parents to better understand the purpose of new S.T.E.A.M. educational programs. Moreover, it seems that innovators are more aware of the gaps on the marketplace and this question should be further investigated by researchers. Innovators also seem to be more knowledgeable about the future trends and changes in the market place and nature of work. Ivan Jelušić, one of the interviewees innovators, suggested that: "those kids need to be taught to follow trends and technology. There will be a lot of companies on Osijek's market and entering foreign markets will be normal".

It also seems that public kindergarten and school programs take too much children's time and new S.T.E.A.M. educational programs' creators will need to investigate whether to shorten their classes or perhaps conduct them on weekends when the children are not tired.

Entrepreneurs and educators could also focus on building competitive advantage in the market by giving examples from nature to connect math and aesthetics and put a weight on research in the programs. Wynn and Harris (2013) argue that concepts such as the Fibonacci

sequence in nature, based on which the third number is the sum of two preceding numbers, could be used to teach children about basic math skills. Also, entrepreneurs or educators that recognize the need for innovation in education programs will benefit from following emerging trends and become leaders and pioneers on the market. Moreover, they have a unique opportunity to create an unexplored market demand, instead of competing in already highly competitive red markets of solely art based programs. Blouin et al. (2009) argues that new educational programs should be mindful of the future of work and focus on creating a vision for future learning environments and a strategy for successful implementation of innovations in educational delivery. However, research suggests that the new S.T.E.A.M. educational programs also need to put more emphasis into story telling and mentoring, without losing the fun factor. The evidence-based education is another concept that could be applied because children should be able to think independently, critically and research and synthesize concepts.

The other important aspect to consider when deciding whether or not to start new S.T.E.A.M. educational program on Osijek's market is the pricing of such program. Based on the research results, it seems that the pricing should be either set high so it is available only to high income parents and the location should be at the center of the Osijek, where upper class lives or the pricing should be set low so that it becomes available to the mass population of parents living in Osijek. The second choice of setting the price of such programs lower is reasonable because Osijek is the family town, where many families live.

Another important research insight is that many working mothers already involved their children in different activities to balance their careers and family life, so it seems that the program should be flexible and constructed based on working parents' needs to fit their busy schedules. It is also recommended that future researchers use a mixed sample based on gender

and income level that may offer different results and provide more insights about preferences related to the unique S.T.E.A.M. Programs, the economic status of the local community and the readiness of buyers.

It is also important to further consider making the new S.T.E.A.M. educational program designed for older children because some participants have indicated that age of five may be too early for children to become involved with such programs. However, participants that revealed their concerns might have understood that the program is not based solely on preparing children for the future of work.

Research findings also reveal that many participants believe that children have better developed senses than grownups and that those senses should be used and further developed through education. In addition, it seems that the participants believe that making mistakes is a great way to learn so the new S.T.E.A.M. programs should not involve bad grades or any kind of similar punishments. Instead, such programs should encourage children to learn from their mistakes. Moreover, participants indicated that learning by heart is the problem of the current educational programs and that the purpose of learning should be the understanding, not only memorizing the concepts. Furthermore, Matias Knežević, one of the interviewees, suggested that children should always be asked for their opinion. The reasons why things are the way they are should be explained to children so that they can learn by questioning and understanding concepts. Also, Matias Knežević added that: “the atmosphere for kids should be more creative and that kids should independently make decisions. Kids should always be asked: “What do you think should be done? In any given situation. “

Based on the emerging trends from indicated in the literature review of this research proposal and based on the research findings, there seems to be no direct competition on the market. Melita

Polić, one of the focus group participants, shared that: “In Osijek there is not really a choice for education, but there are many foreign language schools and good kindergartens where children have fun”. Another important finding is that some parents also believe that studying languages and arts is the competition of such programs which shows that there are not familiar enough with the S.T.E.A.M. terminology and the purpose of the program.

To gain advantage in the market, entrepreneurs should consider gaining in depth knowledge of popular alternative teaching methods such as the Montessori Method. They should also take into consideration branding the programs in the context of the local culture to attract local community. Perhaps the term S.T.E.A.M. and the program descriptions could be changed to meet the needs of the Osijek’s market and to ensure that parents understand the program’s philosophy. In addition, entrepreneurs should consider using the name “Tinker Labs” because it may also create confusion due to its foreign origin and due to parents’ unfamiliarity with foreign terms. Contrary, innovators seem to understand the S.T.E.A.M. terminology better because they follow trends and are familiar with the term.

The research also found that participants value program that would encourage the child’s understanding of the world and globalization. It seems that the terms “Planet”, “World” and “Community” could be adjusted to local language and used in the name of the program so that global perspective of the program is communicated well.

To tap the greatest potential from the current emerging trends and lack of innovation on the market, entrepreneurs and educators will have to adapt to the local market and pre-act to changes to accommodate for the future success. If entrepreneurs and educators choose to remain stagnate, their future in the education industry will be compromised.

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Appendix A

Research Questions

Interview Questions

Prior to each interview, a short ten minute presentation about Tinker Labs programs will be shared with each participant. The presentation will consist of a description of the program, Tinker Labs' mission and vision and future possibilities for collaboration with "Udruga Inovatarstva".

1. What do you think about Tinker Labs educational programs?
2. How can we help children to make connections across disciplines? Please explain.
3. How public kindergartens and schools in Osijek prepare children for the upcoming changes in the work environment or no? If yes, what do you believe the future of work is going to look like? If no, why not and what do you believe the future of work is going to look like?
4. What do you think about demand and supply for children's programs in Osijek? What are the emerging market trends you experienced or are aware of?
5. From your point of view, how do children learn best?
6. From your experience in innovating or teaching, please describe the Osijek's market. (What are the attitudes toward change in general like? Is there enough support from the city? If yes, what kind of support and why?)
7. What do you think, how can children from five to ten be effectively introduced to science (if innovator: to your discipline)?
8. From your experience, what is the most effective pedagogical method in your opinion and why? Would the majority of people in Osijek agree with you?

9. What do you think about the Osijek's market as a place to start new educational programs for young children? Please explain your opinion.

Focus Group Questions

Prior to a focus group, parents will be given a short ten minute presentation about the benefits of a Tinker Labs program for children. Ice-breaker questions will be used to help participants relax since they do not know each other. Parents will be asked how is their day, how are their children and similarly. Each participant will be asked to answer each question and research will seek to start a dialogue between participants on the following topics or questions.

1. How does your child learn best?
2. Does your child enjoy learning? Where does your child learn best?
3. How would you describe the demand and supply for educational programs for children in Osijek?
4. What do you think about learning through play and experiments?
5. What are you doing to prepare your child for the future of work?
6. How should education for children look like?
7. What concerns you about your child's past, present and future education? Do you talk with other parents or friends about it?

Appendix B

Research Results

Interview Questions and Answers in Croatian, Followed by Translations to English

Questions in Croatian:

1. Što mislite o Tinker Labs edukacijskom programu?
2. Kako možemo pomoći djeci da povežu različite discipline?
3. Vjerujete li da javni vrtići i škole u Osijeku dobro pripremaju djecu za budućnost i promjene u prirodi posla? Ako da, kako mislite da će budućnost posla izgledati? Ako ne, kako mislite da će budućnost posla izgledati?
4. Što mislite o potražnji i ponudi programa za djecu u Osijeku? Kakvi su trendovi na tržištu koje ste iskusili ili ste svjesni da postoje?
5. Vaše osobno razmišljanje o tome kako djeca najbolje uče?
6. Iz Vašeg iskustva u predavanju ili sa inovacijama, opišite Osječko tržište. (Kakvi su stavovi prema promjenama? Ima li dovoljno potpore od grada?)
7. Kako djeca u dobnoj skupini od 5 do 10 godina mogu biti uključena u znanost?
8. Iz Vašeg iskustva, koja je najbolja pedagoška metoda i zašto? Što mislite jel bi se puno ljudi u Osijeku složili sa Vama?
9. Mislite li da je Osječko tržište dobro za započeti Tinker Labs? Molim Vas objasnite zašto tako mislite.

Answers in Croatian starting with the participant name and participant information.

1. Osoba intervjuirana: Jovica Hardi

Datum, Trajanje, Lokacija: 13.8.2016., 15 minuta, "Uduga Inovatarstva" in Osijek

Spol i dob: Muški, 60 godina

Jezik: Hrvatski

Pozadina, obrazovanje: Inovator u prehrambeno-tehnološkoj industriji, ima iskustva sa projekcijom tvornica.

Funkcija, firma i opis: PhD i profesor u trajnom zvanju na prehrambeno tehnološkom fakultetu u Osijeku

Odgovori:

1. Eksperimenti su najbolji način zato što djeca mogu odmah vidjeti kako stvari funkcioniraju i oni su kao senzori, raspoznaju okuse i sastojke mlijeka, i prirodno mogu raspoznati vrstu mlijeka. Jos, djeca uče kada rade sa rukama. Morate biti drugačiji, ali morate imati i kapital kako bi proveli svoje ideje i prodavali. U Zagrebu, njihov udruga inovatarstva ima više novca za putovanja da posjete natjecanja u inovatarstvu u zemlji.
2. Takvim programima i dolazi do inovacija. Trebali bi svi ohrabriti djecu da budu kreativna. Grad i županija trebaju poduprijeti poduzetnike i trebamo sredstva. Djeca najbolje uče kroz eksperimente i rješavanje problema, i dobro je to imaju pristup tehnologiji.
3. Osijek je grad gdje mnogi podižu djecu i potražnja raste zato što nema puno toga na tržištu i mali poduzetnici ne mogu zaraditi. Uzmimo za primjer moga kolegu koji je trebao 28 kuna

kako bi izumio med i zapakirao proizvod, a oni mu nude 30 kuna da proda gotovi proizvod u trgovini.

4. Vratimo se na djecu, oni su kao sensori i uče kroz postavljanje pitanja i male eksperimente kao onaj kada trebaju raspoznati razlike u mlijeku u čaši. I današnja djeca imaju pristup informacijama što je super. Tržište u Osijeku je specifično, ne može sve biti uspješno zato što izumitelji nemaju pomoć od grada i od županije kako bi započeli svoje poslove. Ima oko 500 zapreka preko kojih treba prijeci, jako su procesi komplicirani, trebaju različite dozvole, i jako je dug proces da biste nešto započeli.
5. Djeca najbolje uče kroz samostalno istraživanje, kao dijete sam uvijek čitao očeve knjige koje sam volio. Kao otac, primjetio sam da djeca vole upotrebljavati svoja osjetila u eksperimentima i dok se igraju. Djeca imaju dobra osjetila, mogu raspoznati okuse, mirise i sve cuju. Ali djeca imaju odlične sposobnosti za detalje. Ne pričam Vam o lego kockama zato što to 90 posto djece može. Na primjer, djeca će uvijek naći rupu u sistemu i kroz malo igre rješavanja problema, staviti trokut gdje treba ći četverokut. Gle jednostavne stvari: djeca uvijek nose igracke na način da ih zgrabe za uho zato što razumiju silu teže. Isto, djeca imaju dobru memoriju, sjećaju se okusa iz djetinjstva, i zato se stavlja sladilo u proizvode za djecu. Djeca trebaju naučiti kako da prirodno pronađu načine da voze bicikl, isto kao što znaju što je sila teža. Djeca trebaju biti učena na način da im pričate price i date im dobra objašnjenja zašto je nešto tako, odgovorite im. Djeci ne treba govoriti da nešto moraju.
6. Grad i županija trebaju poduprijeti poduzetnike, više novca je potrebno. Da, kao što sam rekao, djeca uče kroz eksperimente i rješavanje problema.

7. Inovacija se može dogoditi kao spoj kreativosti i razumijevanja novih tehnologija koje djeca razumiju. Dijete od pet godina sve može brzo naučiti na Ipadu. Djecu treba ohrabrivati da postavljaju pitanja i roditelji i edukatori im trebaju odgovoriti točno. Najgora je ona reklama sa ljubičastom kravom na TV-u sto su se marketingaši dosjetili. Puno djece koja žive u gradovima i neznaju kako krava izgleda ili odakle dolazi mlijeko su zaludena, i najtužnije je sto im roditelji nemaju vremena odgovoriti na pitanja i komunicirati sa njima ili ni sami neznaju kako odgovoriti djetetu. Djeca žele da im se odgovori tako da mogu povezivati koncepte i razumijeti ih potpuno.
8. Kroz igru, zabavne ekperimente i ne zaboravite istraživanje.
9. Nije nešto teško izumiti, Hrvati dosta dolaze do novih izuma ali je tesko proci kroz procese I dobiti dozvole i nema podrške od grada I zupanije. Ali krenite ako vjerujete u to.

Translation to English.

1. Person Interviewed: Jovica Hardi

Date, Duration, Location: 13.10.2016., 15 minutes, “Uduga Inovatarstva” in Osijek

Gender and age: Male, 60 years old

Language: The interview is conducted in Croatian and translated to English

Background, Education: An innovator in food technology and in the food industry, experienced in projecting factories

Function, company and description: PhD and full time professor at “Faculty of Food Technology Osijek”

Answers:

1. The experiments are the best way because children can immediately see how something works and they are like sensors, they recognize tastes and ingredients in milk and they will always recognize the type of the milk naturally. Also, kids like to learn hands on. You have to be different, but you also need to have capital to realize your ideas and start selling your products. In Zagreb, their “Udruga Inovatarstva” gets more funds to travel and in Osijek we cannot even get funding to make a couple of trips to visit major competitions in innovations inside the country.
2. Of course, programs can help because they lead to innovation, that is how innovation happens. We should encourage kids to be creative. The city and the county should support business, there should be more funding for Osijek. Entrepreneurs need support.

Also, kids learn the best through problem solving and experimenting. It is also good that children now have an access to technology.

3. Osijek is a town where many families live to raise their children. The demand is getting bigger and there is not much to offer on the market because it is not possible for small entrepreneurs to earn money.
4. Let’s take my colleague that invented honey, he had to invest twenty eight kunas to make the product and package it and they are offering him only thirteen kunas to sell the finished product at the store. Let’s go back to kids, they themselves are as sensors and they learn through asking questions and doing simple experiments such as the one where they have to recognize the differences between type of milk in the glass. Also, kids nowadays can access a lot of information and that is good. The market in Osijek is specific, not everything can be

successful in this kind of market because inventors do not have support from the city or county to start their businesses and sell their products. Let's take Poland and Denmark as a good example of how the market for innovators should be. There are about five hundred barriers on Osijek's market, a way too complicated processes to get various permits, and the process to start something is very long itself.

5. Through independent research, as a child, I always read my father's books to see what is he doing because I was interested in it. As a father, I also noticed that kids like to use their strong senses in experiments and while they are playing. Kids have better senses, they recognize tastes, smells and hear everything. Also, kids have an extraordinary ability to pay attention to details. I am not talking about Lego here because ninety percent of children can build with Lego. For example, kids will always find a hole in a system and through little problem solving games and put a triangle through a hole where the rectangle should go. Think about simple stuff: kids always carry their toys in a way in which they grab them by the ear because they understand the gravity. Also, kids have a good memory, they remember tastes from their childhood, that is why they put a little sweetness in kids syrups. Also, kids need to be taught that they can naturally find out ways to understand the gravity as they ride bicycles. Kids should be taught in a ways in which you tell them stories and give them good explanations why is something as it is and in which you answer their questions. Also, kids should not be told they have to do something.
6. The city and the county should support business, there should be more funding for Osijek. Also, the kids learn best through problem solving and experimenting.

7. The innovation can happen as a match between creativity and understanding of new technologies that kids understand. A five year old child will easily learn everything on Ipad. Kids should be encouraged to ask questions and parents and educators should give them correct answers. The worst is the commercial about purple cow on TV that marketers came up with. Many kids that live in cities do not know how a cow looks like or where the milk comes from, and the saddest part is that parents either do not have time to answer their questions and communicate with them or they simply do not know any answers themselves. Kids want their questions to be answered so that they can easily make connections about concepts and put them together to understand them fully.
8. Through play and fun experiments, also don't forget research.
9. It is not hard to invent something, Croatians invent a lot of new things, but it is difficult to get through long processes to get patents and permits and there is no support from the city or county. However, go for it if you believe in it.

2. Osoba intervjuirana: Krunoslav Weinpert

Datum, Trajanje, Lokacija: 9.10.2016., 15 minutes, BIOS incubator in Osijek

Spol i starost: Muški, 44 godine

Jezik na kojem je obavljen intervju: Hrvatski

Pozadina, obrazovanje: Elektrotehnička škola, radno iskustvo i istom području i u inovacijama od 7.razreda osnovne škole,radio na Apple13, ima dva patenta vezano za solarnu energiju, radio u medijima, 25 godina radnog iskustva

Funkcija, tvrtka i opis: vlasnik i direktor tvrtke **Apria** i pokretač turističke aplikacije *Pointers* za digitalizaciju Hrvatskog turizma putem mobilne aplikacije, iskustvo kroz rad na medijima (HRT, STV) kao snimatelj i producent , u marketingu, 10 godina suradnje sa Korejancima, kroz putovanja u New Orleans (sajam marketinga), u Kinu (nastupi u Europi na sajmovima – razvio se mix znanja, iskustva, različitih kultura).

Odgovori:

1. Zanimljivo, djeci su potrebni mentori sa iskustvom jer im treba objasniti da ne mjere svoje sposobnosti i kvalitetu ideja prema uspjehu u Osijek – svijet je velik. Ja svoju djecu odmalena vodim na putovanja po svijetu da shvate globalizaciju. Djeca su svjesna tehnologije i postoje nevjerojatne mogućnosti za njih u vremenu u kojem se tvrtke moraju konstantno prilagođavati i mjenjati.
2. Naravno, škola je tu osnovna stvar i ne treba se davati djeci na izbor da odluče žele li ići u školu ili ne. Mladi ljudi moraju biti upoznati sa mogućnostima globalnog tržišta i da im je na vrijeme prezentirano kakve mogućnosti imaju, danas ni Hrvatska nebi doživljavala takav odljev mozgova prema inozemstvu.
3. Da, ali djeci trebaju mentori sa iskustvom, da su institucije - od obrazovnih do centara za poduzetništvo, privatne, bilo bi bolje.
4. Definitivno postoji potražnja, no djeci nedostaju mentori sa iskustvom koji bi ih podučili trendovima na tržištu na vrijeme.
5. Kroz praktični rad i izloženost pozitivnom okruženju koje se sastoji od ljudi sa iskustvom i sa znanjem, poput mentora, te kroz putovanja.

6. Grad Osijek isto tako može učiniti puno više jer ima puno potencijala u Osijeku. Primjerice, postoje puno praznih gradskih prostora koji bi se mogli dati poduzetnicima, tako da se još više potaknu ljudi na inovacije.
7. Naravno, ali putem praktičnog rada i uz pomoć dobrih mentora.
8. Škole imaju dobre metode, ali se moraju potruditi da na vrijeme djecu upoznaju sa tržištem i sa trendovima. Mislim da bi se puno ljudi složili samnom, osobito inovatora.
9. Naravno da je, djeci trebaju mentori i u Osijeku ima vrijednih ljudi, koje bi mogli zaposliti.

Answers:

2. Person interviewed: Krunoslav Weinpert

Background and education: an innovator and entrepreneur in tourism

Gender: male, Age: 44, language: interview was conducted in Croatian and translated to English

1. It is interesting, children need mentors with an experience that would explain them not to measure their abilities and quality of their ideas based on Osijek's market – the world is a big place. I teach my kids, since they were born, through travelling; I take them to world journeys so that they can better understand globalization. Children are aware of technologies and there are amazing possibilities for them, in this time where companies need to constantly change and adapt.
2. Of course, school is a major thing and kids shouldn't have a possibility to decide whether or not they should go to school. Young people need to get to know the possibilities of global market and if they had a chance to see them when they were very young, we wouldn't have such a brain drain today – kids leaving Croatia.

3. Yes, but kids need mentors with experience, if institutions – from educational to centers for entrepreneurship, were privately owned, it would be better.
4. There is definitely demand, but kids need mentors with an experience that would teach them about market trends on time.
5. Through practical work and exposure to positive surrounding made of people with knowledge and experience, like mentors, and through travel.
6. City of Osijek can do a lot more because there is a lot of potential in Osijek. For example, there is a lot of empty space a city could give to entrepreneurs, so that people are motivated to be creative.
7. Yes, but through practical work and with help of good mentors.
8. Schools have good methods, but they need to work more on making kids familiar with market and trends. I think many people would agree with me, especially innovators.
9. Of course, but kids need mentors and there is also a lot of valuable people that could be employed.

The following four interviews are originally conducted in English.

3. Person Interviewed: Josip Bartulić

Date, Duration, Location: 9.10.2016., 15 minutes, BIOS incubator in Osijek

Gender and age: Male, 26 years old

Language: The interview originally conducted in English

Background, Education: An innovator, finished Faculty of civil engineering, a member at „Udruga Inovatarstva“

Function, company and description: An employee at Transcom, Osijek with customer support

Answers:

1. The experiments are the best way to educate kids because they can immediately see how something works and remember it for the rest of their lives. Tinker Labs should balance technological and other advances and pricing of the program – make it better and cheaper.
2. Yes, robotics, computing, chemical engineering to make connections between new materials, engineering to use those connections in the real world.
3. Not really, the future are robotics, computing and chemical engineering and kids new to have good abilities to make connections and their own conclusions.
4. The market in Osijek is specific, not everything can be successful in this kind of market. This is because the purchasing power of people in Osijek is low, about 70% of people are struggling to pay for living expenses. However, since Tinker Labs will be affordably priced, about 200 kunas as you said, I believe that many parents will look at it as a good value for fair price on the market and involve their children into the program. Regarding supply, there is nothing similar to Tinker Labs on the market. Also, Osijek is a family town, where many families live to raise their children, but also many families are living for a search of better lives and jobs to other European countries.
5. From mine and my mother's perspective (and she is teacher in elementary school), children learn the best if the program is of a good quality and if you teach them through play.
6. The demand is getting bigger and there is not much to offer on the market. The demand is rising because of the development of technology. Also, kids nowadays can access a lot of

information and it is easier for them because the change in technology is happening faster. We also tried something similar for children at “Udruga Inovatarstva”. We made a project about children that have no guardians and about different ways to educate them about 3D printing, making projects and models. We also applied for grants, which is called “Reach for Change” and sponsored by TELE2 but we have not won. It was a tough competition, but you at Tinker Labs should check it out.

7. You should make sure they are creative, but you should also make sure they have technical competencies so they can come up with their own ideas. The innovation can happen as a match between creativity and understanding of technologies.
8. Experience and work definitely, but also creative challenges and good teachers.
9. Of course it is, there are parents that are aware of changes in technology, it is not too early to start because Osijek is a family town.

4. Person Interviewed: Sabina Harambašić

Date, Duration, Location: 7.10.2016., 15 minutes, Tinker Labs office in Osijek

Gender and age: Female, 31 years old

Language: The Interview originally conducted in English

Background, Education: Bachelor in Early Childhood Education and Montessori experienced teacher

Function, company and description: Teacher, unemployed

Answers:

1. The experiments are the best way to educate kids because they can immediately see how something works and remember it for the rest of their lives. Tinker Labs should balance technological and other advances and pricing of the program – make it better and cheaper. First, offer instruction in small groups and more individual approach and satisfy different needs of each specific child. Next, make a program to offer something new, different and interesting so that kids can later benefit from in their future lives and spheres of their lives.
2. Tinker Labs should teach children to find solutions outside of the box, to practice how to find solutions to new problems, and how to constructively solve problems to deal with failures and to learn to be persistent and not quit.
3. Not really, but the blame is not on teachers – they are underpaid and don't have materials to work with.
4. I think that the supply is so small, and the demand is very high. Kids are forced to be in public school programs because they do not have a choice. Especially kids with special needs, those that have disabilities and those that are gifted do not have a choice because there are no programs. The closest program is in Dakovo, Montessori programs that has only four rooms and not enough capacity to meet the needs of the market. Waldorf is also only in Zagreb, but they will open the Waldorf kindergarten in Osijek. I think that parents are looking for short programs because those that exist in Dokica are not of a good quality. Also, in Breza “Zemlja bez granica” lasts only seven days and kids cannot be included during the entire year. In Dokica, they have a couple of workshops for kids, but they are inconsistent. Also, library in Osijek has some workshops, but once in a while. In terms of English, there are no creative workshops or those with puppets. In Vietnam,

there are so many schools and kindergarten with different themes and methods of teaching, but in Osijek a few.

5. Through work. I mean so they see, hear, touch, investigate, smell and use all of their senses. Kids should be included in the process of creating curriculum and they should be the ones to say what they actually need - to change the way of work. Kids should be immersed. All questions should be allowed and kids should not be afraid to ask questions, to try and to loose. Kids should be able to question why things are the way they are.
6. Osijek is a family sleepy town. I think that Osijek has a different phases when there is nothing to offer, but during summer there are some activities for families such as the night of theatre, Osjecko ljeto kulture, Zemlja bez granica, Olimpijade. In terms of education and further development and learning, there are few possibilities for further development and special workshops. Our workshops are not of a same quality like those out of Croatia. There are only few workshops and the limited number of educators that can attend. For example, the prices and high and kindergartens send only two out of twelve educators. If you want to educate yourself further, you have to invest your resources and kindergarten will not finance certificates or pay you extra to teach English. The same applies to different workshops, sport and similar.
7. Yes, through experiments, and they are I think that the excellent way for kids to understand the world around them, to develop divergent thinking and become involved in the surroundings and in community, in particular nature, mechanics, things, technologically...
8. Again, experiments and Montessori approach. I believe that parents think so too.

9. Of course it is. Tinker Labs should teach children to find solutions outside of the box, to practice how to find solutions to new problems, and how to constructively solve problems to deal with failures and to learn to be persistent and not quit.

5. Person Interviewed: Matias Knežević

Other people present: Kristijan Gorupić (Director) and Niko Jeleč (employee)

Date, Duration, Location: 13.10.2016., 15 minutes, “Uduga Inovatarstva” in Osijek

Gender and age: Males, 20-23 years old

Language: The interview originally conducted in English

Background, Education: Innovators, economics, solar energy, electro-technical knowledge

Function, company and description: Kristijan Gorupić, Matias Knežević (directors of Pitaya Solutions d.o.o.) and Niko Jeleč

Answers:

1. If you would ask us at BIOS incubator, I am sure we would all agree this is a great idea and project. There will always be something new to come up with. I think that parents and elementary schools, but also the personal motivation of the child will determine what kind of individuals they will become. I believe that the atmosphere for kids should be more creative and that kids should independently make decisions. Kids should always be asked: “What do you think should be done? In any given situation. What happens now is that most kids grow up and do things, but they don’t know why they’re doing them.

2. Of course, we all come (my team) from different disciplines and we are all creative people.
3. Not really, The city and the county should support business, there should be more funding for Osijek. Also, kids learn best through problem solving and experimenting. It is also good that children now have an access to technology.
4. We in Croatia are always behind other countries and I believe it will stay like that. However, people will have to learn more because jobs won't be permanent. What happens now is that generations of our parents cannot compete with our generation because they are technologically illiterate, they still believe that people should have 1 job in life – which will change, and they have the knowledge but they do not have experience. I believe that in the future, kids – future adults will change jobs more often and need to be more adaptable. It would be ideal when people would change jobs and gain different experiences to start something on their own. Kids should first learn how to work before they start something on their own. The best thing is when people build their career little by little so that the nature of jobs changes them. It is the way of thinking that the people have problems with, not the system, so it all comes to self-motivation. Also, culture influences on kids growth because when the child starts questioning himself and starts understanding how things are, the personal growth happens. If the Croatian economy wants to survive, the Croatian culture will have to change and entrepreneurship will naturally happen. I believe that entrepreneurship happens when people have diverse knowledge and ideas and when they can look at things from different perspectives. The future of today's kids depends on the willingness of parents and school to motivate them to explore and research things around them. The future of kids today also depends on

their intelligence which connects to the circumstances in which kids should be encouraged to research and make their own conclusions. It actually all comes down to intelligence, logic is very important. Kids should be grouped by their abilities, but also by the age because we need low skilled and high skilled workers to survive as a society.

5. My educational experience was great because I managed to enroll in major I was interested in, but I think that school is not structured well. Kids simply learn too much in school, and I prefer an American or German system of education over the Croatian one. In Croatian schools, kids need to memorize a lot of information and those wide subjects are for later (general education). Kids should have a habit of learning by doing, not a habit of learning by hearth.

Kristijan Gorupić adds:

I never liked education, but I liked learning. I make that distinction simply because I don't like how schools are structured. Why should everyone have 4.0? GPA, who says that is the way to go? I did not like to study by hearth because studying by hearth is a waste of time. I understand that kids get the grades to feel some sort of obligation for the future.

6. The Osijek's market has a potential for IT sector, which is supported by the success of Software City in Osijek. I think that parents want to be ready for the Tinker Labs concept because the majority of them do not like the risk. Our parents would put us in the program and the parents of all of us in Bios incubator, but other parents simply do not follow and understand trends. However, if Tinker Labs accepts the small number of kids, it should be okay, because there are some parents that want more for their kids and are open to try new things. Also, if Tinker Labs would become a high school – count in

entire Slavonia and Baranja region. Moreover, if you open a faculty – become a leader on the entire Croatian market and attracts a lot of young adults that make their own decisions. The Osijek Software City is a good example of the potential of Osijek's economy. However, Osijek also needs physical force, not only IT people. I believe that many new foreign companies will open in Osijek.

7. Yes, through associations and clubs. We all worked on the development of our ideas through local association related to solar energy resources. I believe that new ideas come from specific people that are deep in the fields and less social than others.
8. Doing fun experiments, researching what is in – trends and putting emphasis on learning by doing.
9. Yes, why not? If you ask us innovators, we would say yes. Other people will also have to change and adapt. Kids will need to experiment more and learn by making their own findings and conclusions.

6. Person Interviewed: Ivan Jelušić

Date, Duration, Location: 12.10.2016., 15 minutes, BIOS incubator in Osijek

Gender and age: Male, 25 years old

Language: The interview was originally conducted in English.

Background, Education: When I was 21, I went to work for Goldman Sach in London and I was present at the London School of Economics' alumni meetings, where I learned to work. I have companies now, but I have big experience in sales and kids' engineering. I am also experienced

in negotiating, even though I have only high school. My team was 3rd on competition in negotiating in Europe and 7th worldwide.

Function, company and description: the owner and director of company **uPlug** and innovator. I also have a couple of more companies and I am a director of fund for high risk investments.

Answers:

1. Interesting, I believe that kids need to have a chance to create, but not for the purpose of education. Moreover, I believe that there will be less and less paper and those kids need to be taught to follow trends and technology. There will be a lot of companies on Osijek's market and entering foreign markets will be normal.
2. Of course it can, I also connected disciplines through different knowledge and experience in kids' engineering.
3. No, the future is in temporary employment and freelance industry. Let's take an example of a student that studies, law and goes out to the employment market without any knowledge about negotiating that is not good.
4. There is definitely demand, but kids need people with an experience to teach them. It is not enough to finish college and expect a job. Also, the culture negatively influences kids because their parents don't follow trends and didn't manage to comprehend the advantages of technologies. I don't think it is too early to start Tinker Labs and enter the market because millennial generation will understand the value of this kind of program, but we shouldn't generalize because there are some parents now that would be interested for something like that. Also, your location is excellent, in the very center of Osijek where upper class parents live.

5. Through research, creative thinking and international experiences.
6. The city of Osijek can do a lot more and there is a lot of potential in Osijek. But, the culture is a problem because our parents still don't understand their kids and don't follow trends. There is a support from the city, but not enough of it. Attitudes toward change of the millennial generation are good, but attitudes of our parents and of the majority are not – they are still skeptical. But, there is a minority that accepts changes which is enough.
7. Of course, but through practical work and with big will and motivation. Also, there will be more kids included, because everything is changing and they have to be adaptable.
8. Experience and work definitely, college doesn't mean work today. Also, I believe that my generation of millennial would agree with me.
9. Of course it is, there are parents that are aware of changes in technology, advantages of creative thinking and it is not too early to start because everything, also market, changes for the better.

Focus Group Questions and Answers in Croatian

Date: October 28th, 2016

Questions in Croatian

1. Kako Vaše dijete najbolje uči?
2. Uživa li vaše dijete u učenju?
3. Kako biste objasnili potražnju i ponudu za edukacijske programe za djecu u Osijeku?
4. Što mislite o učenju kroz dječju igru i ekperimente?
5. Što radite kako biste pripremili svoje dijete za budućnost posla kad odraste?
6. Kako bi obrazovanje za djecu trebalo biti?
7. Što Vas zabrinjava vezano za prošlo, sadašnje i buduće obrazovanje Vašeg djeteta?
Razgovarate li o tome sa drugim roditeljima ili prijateljima?

Answers in Croatian starting with the number and the participant name.

1.Bojana Šimac

1. Primjetila sam moje dijete gleda što rade stariji pa ih imitira.
2. Za sada u vrtiću i kod kuće.
3. Smatram da je puno nas roditelja zainteresirano za takve programe no ih nema ih u Osijeku.
4. Moje dijete najbolje uči kroz igru.
5. Svaki dan ju pratim i promatram kojim je vještinama sklona.
6. Djeca se vole igrati i mislim da se tako i obrazuju dok su djeca kako bi se pripremila za budućnost.

7. Sa prijateljima jako puno razgovaram jer i oni vole da im se djeca bave raznim aktivnostima kao što su ples, gimnastika, crtanje, učenje jezika. Također je važno da se puno igraju i razvijaju svoju maštu kako bi se što bolje pripremili za budućnost.

2. Martina Vulin

1. Uglavnom kroz igru.
2. Najbolje uči kod kuće kada je u svom svijetu igraćaka legića i slikovnica.
3. Mislim da su edukacijski programi za djecu dobri, ali sam protiv toga da se djecu opterećuje od malih nogu.
4. Mislim da je učenje kroz igru odlično jer su djeca kreativna i puna mašte.
5. Mislim da je još rano sa pet godina da pripremam svoje djete za budućnost posla, ali već sada uočavam kod svoga afinitet prema slaganju, spajanju, gradnji, ali nikako recimo prema crtanju.
6. Trebalo bi biti zabavno.
7. Za prošlo ništa, a što se tiče budućeg polako ga počinjemo uključivati u aktivnosti u vrtiću, a dalje ćemo vidjeti. Da, razgovaramo sa prijateljima, i djeca većine već idu na engleski.

3. Melita Marić

1. Uglavnom u vrtiću, upija kod kuće od starijih i guta crtiće.
2. Nisam se raspitivala za nešto drugo za sada, uči u vrtiću i obožava biti sa bakom, slušati priče, promatrati šta ona radi i jako dobro ju oponaša.
3. U Osijeku baš i nema programa i nekog izbora, ali svako učenje je dobro.
4. Kroz igru se puno nauči, a ekperimentiraju stalno.

5. Za sada ništa, nema ni pet godina, ali primjećujem da voli glumiti i oponašati druge.
6. Dok su mali, edukacija treba biti zabavna i vesela.
7. Sada uglavnom uči kroz igru, u budućnosti ćemo vidjeti čemu će biti sklona kad odraste jer će se ionako promijeniti sa godinama, kao svi mi. Nemam vremena da o tome razgovaram sa drugim roditeljima i prerano je za takve teme.

4.Brunkica Sardelić

1. Sa starijima kroz igru i priču.
2. Najbolje uči u prirodi, u kući i u zatvorenom prostoru nema koncentraciju.
3. Nisam baš upoznata, moje dijete na godinu ide u školu, a u vrtić nije išao.
4. Kroz igru najbolje uči, a kako drugačije zainteresirati dijete.
5. Koliko vidim moj od svega najviše voli loptu i ponavlja kako će biti nogometaš.
6. Mislim da djecu treba znati zainteresirati i motivirati ih.
7. Uglavnom se obrazuje kod kuće. Od aktivnosti je išao na njemački. Sa drugim roditeljima još ne razgovaram o obrazovanju.

5.Melita Polić

1. Moje dijete uči u vrtiću i u školi stranih jezika.
2. Uči i uživa kad je raspoložen.
3. U Osijeku baš i nema neki izbor za edukaciju, ma da ima dosta škola stranih jezika i dobrih vrtića u kojima se djeca zabavljaju.
4. Kroz igru i razvijanjem svoje mašte. Moj je pun mašte šta da vam kažem, izlio je vodu u brašno jer je vidio da to mi stariji i baka radimo. Već eksperimentira po kući.
5. Za sada još nisam prepoznala prema čemu ima predispozicije da bi ga mogla prema ičemu usmjeriti. Na primjer jedan čas bi bio pekar, a drugi astronaut i letio u svemir.

6. Ne treba djecu previše opterećivati, samo kroz igru.
7. Ne zabrinjava me ništa za sada, za to još ima vremena.

6.Šatvar Nina

1. Najbolje uči uz razgovor i igru.
2. Krenio je u školu i u početku nije bio oduševljen. Jako je volio ići na crtanje i u Društvo Naša Djeca, inače besplatne kreativne radionice u Osijeku, za sve uzraste.
3. Ima razno raznih programa, ali ne forsiram svoje dijete.
4. Djeca najbolje uče dok se neopterećeno igraju sami ili sa drugom djecom, ovisno o karakteru.
5. Za sada samo promatram što voli i prema čemu je sklon, ali ga još ne usmjeravam.
6. Zanimljivo, edukacije i obrazovanje mora biti djeci zanimljivo, i ne previše naporno.
7. Djecu se ne smije opterećivati i pretjerivati sa očekivanjima i kako se ono kaže sve u svoje vrijeme.

7.Eva Barišić

1. Imam blizanke, jako su hiperaktivne, uglavnom se zajedno igraju i tako uče u svom svijetu.
2. Mislim da im zbog hiperaktivnosti nedostaje koncentracije, uglavnom kodkuće sa starijom braćom.
3. Nisam baš zainteresirana, moje idu jedino na engleski u vrtiću koji je dobro opremljen sam po sebi, učenje engleskog smatram neophodnim za budućnost i to vole.
4. Djecu je super motivirati sa nekim ekperimentima kako bi se počeli zanimati za nove teme.

5. Još su male, gledam ih kako uživaju jedna drugoj praviti frizure, kažu da će obje biti frizerke kad narastu, no vidjet ćemo, ima vremena dok odrastu.
6. Ne smijemo previše očekivati od svoje djece, moramo ih pustiti da se razvijaju u svom smjeru. Bilo bi super da rade samo ono što vole, jer nema ništa ljepše od toga.
7. Osobno sa nikim ne razgovaram sa takvim temama, nemam vremena i djecu se ionako previše opterećuje u školama. Volim i želim da moja djeca što bolje uče, ali ne radim pritisak na njih sa milijun aktivnosti i obaveza.

8.Sunčica Novak

1. Moja djevojčica najbolje uči kad joj pričam priče, to ju najviše zanima.
2. Sve pamti, što god da joj kažem. Uči u školi, kodkuće, a ide i na razne aktivnosti.
3. Mislim da u Osijeku nema dovoljno dobrih programa za djecu.
4. Kroz igru se uči, ali moje mišljenje je da djeca najviše uče dok slušaju starije i kroz govor.
5. To ćemo vidjeti kroz vrijeme, za sada neznam, vidim da obožava životinje i brigu o njima.
6. Opušteno, zabavno i bez presinga.
7. Puno razgovaramo i svi smo različiti i imamo različita razmišljanja. Osobno ne želim previše gledati u budućnost, sve se jako brzo mjenja.

Focus Group Answers translated to English

(Age:39 and Above Average Income Level, Marketing Manager)

1.Bojana Šimac

1. I noticed that my child looks at what the grown ups are doing and she imitates them.

2. For now, in kindergarten and at home.
3. I think that a lot of us parents are interested in that kind of programs, but there is none in Osijek.
4. My child learns best through play.
5. Every day, I follow what she is doing and I am trying to find out which skills she naturally has.
6. Children love to play and I think that they are getting an education and preparation for the future in that way.
7. I talk a lot with friends and they like that their children are involved in different activities, such as dancing, gymnastics, drawing, foreign language schools. Also, it is very important that they play a lot and develop their imagination, to better prepare themselves for the future.

(Age:37 and Above Average Income Level, Doctor of Medicine)

2.Martina Vulin

1. Mainly through play.
2. He learns the best at home when he is in his own world of Lego-blocks and picture books.
3. I think educational programs for children are good, but I am against putting a burden on children from a young age.
4. I think learning through play is great because children are creative and full of imagination.
5. It is still early to start preparing child that is 5 years old for the future of work, but I am already seeing his affinity towards the building, putting together, constructing, but no affinity towards drawing.
6. It should be fun.

7. In terms of the past nothing, but in terms of the future we are starting to include him in activities in kindergarten, and later we will see. Yes, we talk with friends, and the majority of children go to English classes.

(Age:40 and Average Income Level, Soldier)

3.Melita Marić

1. Mostly in kindergarten, he absorbs in kindergarten, absorbs at home from grown ups and absorbs knowledge from cartoons.
2. I did not search for anything else right now, he learns in kindergarten and enjoys spending time with grandmother, listen to her stories and watching what she is doing and he imitates her very well.
3. In Osijek there are not many programs and there is no choice, but every learning is good.
4. A lot can be learned through playing games and they experiment all the time.
5. Nothing for now, he is not even five, but I am noticing that he loves acting and imitating others.
6. While they are little, education should be fun and cheerful.
7. For now he learns through play, but we will see in future towards where will their capabilities lean, when they grow up they will change with the years, like all of us. I do not have time to talk with other parents about it and it is too early for that kind of subjects.

(Age:38 and Above Average Income Level, Fashion Designer)

4.Brunkica Sardelić

1. With grownups through play and story telling.

2. He learns the best in nature, he can't concentrate inside the house and in closed spaces.
3. I am not familiar with it, my child is going to school next year and he did not go to kindergarten.
4. He learns the best through play, how else can a child be interested.
5. As far as I see, my kid likes the soccer ball the most and he is repeating that he wants to be a soccer player.
6. I think it is crucial to interest and motivate children.
7. Mainly, he is getting an education at home. From activities, he went to German. I do not talk with other parents about education.

(Age:37 and Above Average Income Level, Doctor of Medicine)

5.Melita Polić

1. My kid learns in kindergarten and in the school for foreign languages.
2. He enjoys learning when he is in a good mood.
3. In Osijek there is not really a choice for education, but there are many foreign language schools and good kindergartens where children have fun.
4. Through play and through developing his imagination. My kid is full of imagination, I don't know how to better describe it, he poured the water in flour because he saw that we grownups and grandmother do it. He is already experimenting around the house.
5. For now I did not recognize towards what predispositions, he is leaning towards and I can't direct him yet toward any of them. For example, one moment he wants to be a baker and another moment he wants to fly to space.
6. Kids should not be overloaded, only through play.

7. For now nothing worries me, there is still time for that.

(Age:38 and Above Average Income Level, Lawyer)

6.Šatvar Nina

1. He learns the best through conversation and play.
2. He started going to school and he was not thrilled at the beginning. He really liked going on drawing class and in association Drustvo Nasa Djeca, free creative workshops in Osijek, for all ages.
3. There are many different programs, but I am not forcing my child.
4. Children learn best when they are not burdened and when they play alone or with other children, depending on their characters.
5. For now I am watching what he loves and what is he prone to do, but I am not directing him.
6. Interesting, training and education need to be interesting for children, and not too tiresome.
7. Kids should not be overloaded and we should not exaggerate with expectations, and as they say everything in its time.

(Age:39 and Above Average Income Level, Cook)

7.Eva Barišić

1. I have twins, they are hyperactive, mostly they play together and they learn that way in their own world.
2. I think they are lacking concentration because of their hyperactivity, mostly at home with older brothers.

3. I am not really interested, mine goes to English in kindergarten that is well equipped, I consider that learning English is necessary for the future and they love it.
4. It is great to motivate kids with some kind of experiments because that way they could become interested for new topics.
5. They are still small, I am watching them how they enjoy doing hairstyles for each other, they both say they want to be hair stylists when they grow up, but we will see, there is still time until they grow up.
6. We cannot expect too much from our children, we need to let them go so they can develop in their own directions. It would be great if they could do only what they like to do, because there is nothing more beautiful than that.
7. Personally, I do not speak with anyone about that kind of subjects, I have no time and kids are anyway overloaded in schools. I love and want that my kids learn as best as they can, but I am not pressuring them with million activities and obligations.

(Age:35 and Above Average Income Level, Lawyer)

8.Sunčica Novak

1. My girl learns best when I am telling her stories, that interests her the most.
2. She remembers everything, whatever I say to her. She learns in school, at home, and she goes to different activities.
3. I think there are not many programs for children in Osijek.
4. Through play kids learn, but my opinion is that kids learn the most by listening grownups and through speech.

5. We will see that over time, for now I do not know, I see that she loves animals and caring about them.

6. Relaxed, fun and no pressure.

7. We talk a lot and we are all different and we have different thoughts. Personally, I do not want to look into the future too much, everything changes very fast.

Manual Coding Results - Innovators Based On Interviews

The following manual coding results and narrative are based on and correspond to the answers below them.

The Manual Coding Results

4. Perceptions about unique S.T.E.A.M. Educational programs:

Positive: **1a, 1b, 1c, 1d, 2a, 2d, 1e, 9e, 1f, 6f, 9c, 9d, 6e**

Negative:

DNA (Does Not Apply): **2e, 2f, 9a**

Questions: 1, 2, 6, 9

5. Gaps between current and unique S.T.E.A.M. Programs in Osijek, Croatia

Yes: **3a, 2b, 3b, 8b, 3c, 4c, 3d, 4d, 3e, 5d, 4f, 9f, 5e**

No:

DNA (Does Not Apply): **4a, 2c, 3f, 9b, 4e**

Questions: 2, 3, 4, 5, 8, 9

6. Thoughts on Creativity (what is needed to become successful adults):

Related (It is related to children's experiments and/or play): **5a, 6a, 8a, 5b, 7b, 5c, 6c, 7d, 8d, 8e, 9e**

Unrelated (It is not related to children's experiments and/or play):

DNA (Does Not Apply): **7a**, **4b**, **6b**, **6d**, **7e**, **8f**, **7c**, **8c**, **5f**, **7f**

Questions: 4, 5, 6, 7, 8

The Narrative

Based on the questions 1, 2, 6 and 9, the majority of interviewees' perceptions about the unique S.T.E.A.M. Educational programs are positive and they are the following: "the experiments are the best way because children can immediately see how something works and they are like sensors", "kids like to learn hands on. You have to be different, but you also need to have capital to realize your ideas", "interesting, children need mentors with an experience that would explain them not to measure their abilities and quality of their ideas based on Osijek's market – the world is a big place", "through travelling; I take them to world journeys so that they can better understand globalization. Children are aware of technologies and there are amazing possibilities for them, in this time where companies need to constantly change and adapt", "the experiments are the best way to educate kids because they can immediately see how something works and remember it for the rest of their lives. Tinker Labs should balance technological and other advances and pricing of the program – make it better and cheaper", "the experiments are the best way to educate kids because they can immediately see how something works and remember it for the rest of their lives. Tinker Labs should balance technological and other advances and pricing of the program – make it better and cheaper. First, offer instruction in small groups and more individual approach and satisfy different needs of each specific child. Next, make a program to offer something new, different and interesting so that kids can later benefit from in their future lives and spheres of their lives", " this is a great idea and project. There will always

be something new to come up with“, “parents and elementary schools, but also the personal motivation of the child will determine what kind of individuals they will become“, “the atmosphere for kids should be more creative and that kids should independently make decisions. Kids should always be asked: “What do you think should be done? In any given situation. What happens now is that most kids grow up and do things, but they don’t know why they’re doing them“, “interesting”, “kids need to have a chance to create, but not for the purpose of education... there will be less and less paper and those kids need to be taught to follow trends and technology”, “programs can help because they lead to innovation, which is how innovation happens. We should encourage kids to be creative”, “Tinker Labs should teach children to find solutions outside of the box, to practice how to find solutions to new problems, and how to constructively solve problems to deal with failures and to learn to be persistent and not quit“, “parents want to be ready for the Tinker Labs concept because the majority of them do not like the risk. Our parents would put us in the program and the parents of all of us in Bios incubator, but other parents simply do not follow and understand trends. However, if Tinker Labs accepts the small number of kids, it should be okay, because there are some parents that want more for their kids and are open to try new things”, “the city of Osijek can do a lot more and there is a lot of potential in Osijek. But, the culture is a problem because our parents still don’t understand their kids and don’t follow trends. There is a support from the city, but not enough of it. Attitudes toward change of the millennial generation are good, but the attitudes of our parents and of the majority are not – they are still skeptical. But, there is a minority that accepts changes which is enough”, “other people will also have to change and adapt. Kids will need to experiment more and learn by making their own findings and conclusions”, “Tinker Labs should teach children to find solutions outside of the box, to practice how to find solutions to new

problems, and how to constructively solve problems to deal with failures and to learn to be persistent and not quit“.

Based on the questions 2, 3, 4, 5, 8 and 9, the majority of answers confirmed there is a gap between current and new educational programs in Osijek, Croatia as follows: “Osijek is a town where many families live to raise their children. The demand is getting bigger and there is not much to offer on the market“, “school is a major thing and kids shouldn’t have a possibility to decide whether or not they should go to school. Young people need to get to know the possibilities of global market and if they had a chance to see them when they were very young, we wouldn’t have such a brain drain today – kids leaving Croatia”, “but kids need mentors with experience, if institutions – from educational to centers for entrepreneurship”, “schools have good methods, but they need to work more on making kids familiar with market and trends”, “the future are robotics, computing and chemical engineering and kids need to have good abilities to make connections and their own conclusions”, “regarding supply, there is nothing similar to Tinker Labs on the market. Also, Osijek is a family town, where many families live to raise their children, but also many families are living for a search of better lives and jobs to other European countries“, “the blame is not on teachers – they are underpaid and don’t have materials to work with”, “the supply is so small, and the demand is very high. Kids are forced to be in public school programs because they do not have a choice“, “through work. I mean so they see, hear, touch, investigate, smell and use all of their senses. Kids should be included in the process of creating curriculum and they should be the ones to say what they actually need - to change the way of work. Kids should be immersed. All questions should be allowed and kids should not be afraid to ask questions, to try and to loose. Kids should be able to question why things are the way they are“, “the city and the county should support business, there should be more funding

for Osijek. Also, kids learn best through problem solving and experimenting. It is also good that children now have an access to technology“, “my educational experience was great because I managed to enroll in major I was interested in, but I think that school is not structured well. Kids simply learn too much in school, and I prefer an American or German system of education over the Croatian one. In Croatian schools, kids need to memorize a lot of information and those wide subjects are for later (general education). Kids should have a habit of learning by doing, not a habit of learning by the hearth”, “there is definitely demand, but kids need people with an experience to teach them. It is not enough to finish college and expect a job. Also, the culture negatively influences kids because their parents don’t follow trends and didn’t manage to comprehend the advantages of technologies. I don’t think it is too early to start Tinker Labs and enter the market because millennial generation will understand the value of this kind of program, but we shouldn’t generalize because there are some parents now that would be interested for something like that. Also, your location is excellent, in the very center of Osijek where upper class parents live”, “there are parents that are aware of changes in technology, advantages of creative thinking and it is not too early to start because everything, also market, changes for the better”.

Based on the interview questions 4, 5, 6, 7, 8, the majority of answers were related to experiments or play or did not offer any insight into the research questions. The answers that applied were: “Through independent research, as a child, I always read my father’s books to see what is he doing because I was interested in it. As a father, I also noticed that kids like to use their strong senses in experiments and while they are playing. Kids have better senses, they recognize tastes, smells and hear everything. Also, kids have an extraordinary ability to pay attention to details. I am not talking about Lego here because ninety percent of children can build

with Lego...kids will always find a hole in a system and through little problem solving games and put a triangle through a hole where the rectangle should go. Think about simple stuff: kids always carry their toys in a way in which they grab them by the ear because they understand the gravity“, “The city and the county should support business, there should be more funding for Osijek. Also, the kids learn best through problem solving and experimenting”, “through play and fun experiments, also don’t forget research”, “through practical work and exposure to positive surrounding made of people with knowledge and experience, like mentors, and through travel”, “through practical work and with help of good mentors”, “From mine and my mother’s perspective (and she is teacher in elementary school), children learn the best if the program is of a good quality and if you teach them through play“, “the demand is getting bigger and there is not much to offer on the market. The demand is rising because of the development of technology. Also, kids nowadays can access a lot of information and it is easier for them because the change in technology is happening faster”, “yes, through experiments, and they are I think that the excellent way for kids to understand the world around them, to develop divergent thinking and become involved in the surroundings and in community, in particular nature, mechanics, things, technologically...“, “experiments and Montessori approach”, “Doing fun experiments, researching what is in – trends and putting emphasis on learning by doing” “Yes, why not? If you ask us innovators, we would say yes. Other people will also have to change and adapt. Kids will need to experiment more and learn by making their own findings and conclusions”.

The Answers:

1. Person Interviewed: Jovica Hardi

Date, Duration, Location: 13.10.2016., 15 minutes, “Uduga Inovatarstva” in Osijek

Gender and age: Male, 60 years old

Language: The interview is conducted in Croatian and translated to English

Background, Education: An innovator in food technology and in the food industry, experienced in projecting factories

Function, company and description: PhD and full time professor at “Faculty of Food Technology Osijek”

Answers:

1a The experiments are the best way because children can immediately see how something works and they are like sensors, they recognize tastes and ingredients in milk and they will always recognize the type of the milk naturally. Also, kids like to learn hands on. You have to be different, but you also need to have capital to realize your ideas and start selling your products. In Zagreb, their “Udruga Inovatarstva” gets more funds to travel and in Osijek we cannot even get funding to make a couple of trips to visit major competitions in innovations inside the country.

2a Of course, programs can help because they lead to innovation, which is how innovation happens. We should encourage kids to be creative. The city and the county should support business, there should be more funding for Osijek. Entrepreneurs need support. Also, kids learn the best through problem solving and experimenting. It is also good that children now have an access to technology.

3a Osijek is a town where many families live to raise their children. The demand is getting bigger and there is not much to offer on the market because it is not possible for small entrepreneurs to earn money.

4a Let's take my colleague that invented honey, he had to invest twenty eight kunas to make the product and package it and they are offering him only thirteen kunas to sell the finished product at the store. Let's go back to kids, they themselves are as sensors and they learn through asking questions and doing simple experiments such as the one where they have to recognize the differences between type of milk in the glass. Also, kids nowadays can access a lot of information and that is good. The market in Osijek is specific, not everything can be successful in this kind of market because inventors do not have support from the city or county to start their businesses and sell their products. Let's take Poland and Denmark as a good example of how the market for innovators should be. There are about five hundred barriers on Osijek's market, a way too complicated processes to get various permits, and the process to start something is very long itself.

5a Through independent research, as a child, I always read my father's books to see what is he doing because I was interested in it. As a father, I also noticed that kids like to use their strong senses in experiments and while they are playing. Kids have better senses, they recognize tastes, smells and hear everything. Also, kids have an extraordinary ability to pay attention to details. I am not talking about Lego here because ninety percent of children can build with Lego. For example, kids will always find a hole in a system and through little problem solving games and put a triangle through a hole where the rectangle should go. Think about simple stuff: kids always carry their toys in a way in which they grab them by the ear because they understand the gravity. Also, kids have a good memory, they remember tastes from their childhood, that is why

they put a little sweetness in kids syrups. Also, kids need to be taught that they can naturally find out ways to understand the gravity as they ride bicycles. Kids should be taught in a ways in which you tell them stories and give them good explanations why is something as it is and in which you answer their questions. Also, kids should not be told they have to do something.

6a The city and the county should support business, there should be more funding for Osijek. Also, the kids learn best through problem solving and experimenting.

7a The innovation can happen as a match between creativity and understanding of new technologies that kids understand. A five year old child will easily learn everything on Ipad. Kids should be encouraged to ask questions and parents and educators should give them correct answers. The worst is the commercial about purple cow on TV that marketers came up with. Many kids that live in cities do not know how a cow looks like or where the milk comes from, and the saddest part is that parents either do not have time to answer their questions and communicate with them or they simply do not know any answers themselves. Kids want their questions to be answered so that they can easily make connections about concepts and put them together to understand them fully.

8a Through play and fun experiments, also don't forget research.

9a It is not hard to invent something, Croatians invent a lot of new things, but it is difficult to get through long processes to get patents and permits and there is no support from the city or county. However, go for it if you believe in it.

2. Person interviewed: Krunoslav Weinpert

Background and education: an innovator and entrepreneur in tourism

Gender: male, Age: 44, language: interview was conducted in Croatian and translated to English

1b It is interesting, children need mentors with an experience that would explain them not to measure their abilities and quality of their ideas based on Osijek's market – the world is a big place. I teach my kids, since they were born, through travelling; I take them to world journeys so that they can better understand globalization. Children are aware of technologies and there are amazing possibilities for them, in this time where companies need to constantly change and adapt.

2b Of course, school is a major thing and kids shouldn't have a possibility to decide whether or not they should go to school. Young people need to get to know the possibilities of global market and if they had a chance to see them when they were very young, we wouldn't have such a brain drain today – kids leaving Croatia.

3b Yes, but kids need mentors with experience, if institutions – from educational to centers for entrepreneurship, were privately owned, it would be better.

4b There is definitely demand, but kids need mentors with an experience that would teach them about market trends on time.

5b Through practical work and exposure to positive surrounding made of people with knowledge and experience, like mentors, and through travel.

6b City of Osijek can do a lot more because there is a lot of potential in Osijek. For example, there is a lot of empty space a city could give to entrepreneurs, so that people are motivated to be creative.

7b Yes, but through practical work and with help of good mentors.

8b Schools have good methods, but they need to work more on making kids familiar with market and trends. I think many people would agree with me, especially innovators.

9b Of course, **but kids need mentors** and there is also a lot of valuable people that could be employed.

3. Person Interviewed: Josip Bartulić

Date, Duration, Location: 9.10.2016., 15 minutes, BIOS incubator in Osijek

Gender and age: Male, 26 years old

Language: The interview originally conducted in English

Background, Education: An innovator, finished Faculty of civil engineering, a member at „Udruga Inovatarstva“

Function, company and description: An employee at Transcom, Osijek with customer support

Answers:

1c **The experiments are the best way to educate kids because they can immediately see how something works and remember it for the rest of their lives. Tinker Labs should balance technological and other advances and pricing of the program – make it better and cheaper.**

2c **Yes, robotics, computing, chemical engineering to make connections between new materials, engineering to use those connections in the real world.**

3c Not really, **the future are robotics, computing and chemical engineering and kids new to have good abilities to make connections and their own conclusions.**

4c The market in Osijek is specific, not everything can be successful in this kind of market. This is because the purchasing power of people in Osijek is low, about 70% of people are struggling to pay for living expenses. However, since Tinker Labs will be affordably priced, about 200 kunas as you said, I believe that many parents will look at it as a good value for fair price on the market and involve their children into the program. **Regarding supply, there is nothing similar to Tinker Labs on the market. Also, Osijek is a family town, where many families live to raise their**

children, but also many families are living for a search of better lives and jobs to other European countries.

5c From mine and my mother's perspective (and she is teacher in elementary school), children learn the best if the program is of a good quality and if you teach them through play.

6c The demand is getting bigger and there is not much to offer on the market. The demand is rising because of the development of technology. Also, kids nowadays can access a lot of information and it is easier for them because the change in technology is happening faster. We also tried something similar for children at "Udruga Inovatarstva". We made a project about children that have no guardians and about different ways to educate them about 3D printing, making projects and models. We also applied for grants, which is called "Reach for Change" and sponsored by TELE2 but we have not won. It was a tough competition, but you at Tinker Labs should check it out.

7c You should make sure they are creative, but you should also make sure they have technical competencies so they can come up with their own ideas. The innovation can happen as a match between creativity and understanding of technologies.

8c Experience and work definitely, but also creative challenges and good teachers.

9c Of course it is, there are parents that are aware of changes in technology, it is not too early to start because Osijek is a family town.

4. Person Interviewed: Sabina Harambašić

Date, Duration, Location: 7.10.2016., 15 minutes, Tinker Labs office in Osijek

Gender and age: Female, 31 years old

Language: The Interview originally conducted in English**Background, Education: Bachelor in Early Childhood Education and Montessori
experienced teacher**

Function, company and description: Teacher, unemployed

Answers:

1d The experiments are the best way to educate kids because they can immediately see how something works and remember it for the rest of their lives. Tinker Labs should balance technological and other advances and pricing of the program – make it better and cheaper. First, offer instruction in small groups and more individual approach and satisfy different needs of each specific child. Next, make a program to offer something new, different and interesting so that kids can later benefit from in their future lives and spheres of their lives.

2d Tinker Labs should teach children to find solutions outside of the box, to practice how to find solutions to new problems, and how to constructively solve problems to deal with failures and to learn to be persistent and not quit.

3d Not really, but the blame is not on teachers – they are underpaid and don't have materials to work with.

4d I think that the supply is so small, and the demand is very high. Kids are forced to be in public school programs because they do not have a choice. Especially kids with special needs, those that have disabilities and those that are gifted do not have a choice because there are no programs. The closest program is in Dakovo, Montessori programs that has only four rooms and not enough capacity to meet the needs of the market. Waldorf is also only in Zagreb, but they

will open the Waldorf kindergarten in Osijek. I think that parents are looking for short programs because those that exist in Dokica are not of a good quality. Also, in Breza “Zemlja bez granica” lasts only seven days and kids cannot be included during the entire year. In Dokica, they have a couple of workshops for kids, but they are inconsistent. Also, library in Osijek has some workshops, but once in a while. In terms of English, there are no creative workshops or those with puppets. In Vietnam, there are so many schools and kindergarten with different themes and methods of teaching, but in Osijek a few.

5d Through work. I mean so they see, hear, touch, investigate, smell and use all of their senses. Kids should be included in the process of creating curriculum and they should be the ones to say what they actually need - to change the way of work. Kids should be immersed. All questions should be allowed and kids should not be afraid to ask questions, to try and to loose. Kids should be able to question why things are the way they are.

6d Osijek is a family sleepy town. I think that Osijek has a different phases when there is nothing to offer, but during summer there are some activities for families such as the night of theatre, Osječko ljeto kulture, Zemlja bez granica, Olimpijade. In terms of education and further development and learning, there are few possibilities for further development and special workshops. Our workshops are not of a same quality like those out of Croatia. There are only few workshops and the limited number of educators that can attend. For example, the prices are high and kindergartens send only two out of twelve educators. If you want to educate yourself further, you have to invest your resources and kindergarten will not finance certificates or pay you extra to teach English. The same applies to different workshops, sport and similar.

7d Yes, through experiments, and they are I think that the excellent way for kids to understand the world around them, to develop divergent thinking and become involved in the surroundings and in community, in particular nature, mechanics, things, technologically...

8d Again, experiments and Montessori approach. I believe that parents think so too.

9d Of course it is. Tinker Labs should teach children to find solutions outside of the box, to practice how to find solutions to new problems, and how to constructively solve problems to deal with failures and to learn to be persistent and not quit.

5. Person Interviewed: Matias Knežević

Other people present: Kristijan Gorupić (Director) and Niko Jeleč (employee)

Date, Duration, Location: 13.10.2016., 15 minutes, “Uduga Inovatarstva” in Osijek

Gender and age: Males, 20-23 years old

Language: The interview originally conducted in English

Background, Education: Innovators, economics, solar energy, electro-technical knowledge

Function, company and description: Kristijan Gorupić, Matias Knežević (directors of Pitaya Solutions d.o.o.) and Niko Jeleč

Answers:

1e If you would ask us at BIOS incubator, I am sure we would all agree this is a great idea and project. There will always be something new to come up with. I think that parents and elementary schools, but also the personal motivation of the child will determine what kind of

individuals they will become. I believe that the atmosphere for kids should be more creative and that kids should independently make decisions. Kids should always be asked: “What do you think should be done? In any given situation. What happens now is that most kids grow up and do things, but they don’t know why they’re doing them.

2e Of course, we all come (my team) from different disciplines and we are all creative people.

3e Not really, The city and the county should support business, there should be more funding for Osijek. Also, kids learn best through problem solving and experimenting. It is also good that children now have an access to technology.

4e We in Croatia are always behind other countries and I believe it will stay like that. However, people will have to learn more because jobs won’t be permanent. What happens now is that generations of our parents cannot compete with our generation because they are technologically illiterate, they still believe that people should have 1 job in life – which will change, and they have the knowledge but they do not have experience. I believe that in the future, kids – future adults will change jobs more often and need to be more adaptable. It would be ideal when people would change jobs and gain different experiences to start something on their own. Kids should first learn how to work before they start something on their own. The best thing is when people build their career little by little so that the nature of jobs changes them. It is the way of thinking that the people have problems with, not the system, so it all comes to self-motivation. Also, culture influences on kids growth because when the child starts questioning himself and starts understanding how things are, the personal growth happens. If the Croatian economy wants to survive, the Croatian culture will have to change and entrepreneurship will naturally happen. I believe that entrepreneurship happens when people have diverse knowledge and ideas and when

they can look at things from different perspectives. The future of today's kids depends on the willingness of parents and school to motivate them to explore and research things around them. The future of kids today also depends on their intelligence which connects to the circumstances in which kids should be encouraged to research and make their own conclusions. It actually all comes down to intelligence, logic is very important. Kids should be grouped by their abilities, but also by the age because we need low skilled and high skilled workers to survive as a society.

5e My educational experience was great because I managed to enroll in major I was interested in, but I think that school is not structured well. Kids simply learn too much in school, and I prefer an American or German system of education over the Croatian one. In Croatian schools, kids need to memorize a lot of information and those wide subjects are for later (general education). Kids should have a habit of learning by doing, not a habit of learning by the hearth.

Kristijan Gorupić adds:

I never liked education, but I liked learning. I make that distinction simply because I don't like how schools are structured. Why should everyone have 4.0? GPA, who says that is the way to go? I did not like to study by the hearth because studying by hearth is a waste of time. I understand that kids get the grades to feel some sort of obligation for the future.

6e The Osijek's market has a potential for IT sector, which is supported by the success of Software City in Osijek. I think that parents want to be ready for the Tinker Labs concept because the majority of them do not like the risk. Our parents would put us in the program and the parents of all of us in Bios incubator, but other parents simply do not follow and understand trends. However, if Tinker Labs accepts the small number of kids, it should be okay, because there are some parents that want more for their kids and are open to try new things. Also, if

Tinker Labs would become a high school – count in entire Slavonia and Baranja region.

Moreover, if you open a faculty – become a leader on the entire Croatian market and attracts a lot of young adults that make their own decisions. The Osijek Software City is a good example of the potential of Osijek's economy. However, Osijek also needs physical force, not only IT people. I believe that many new foreign companies will open in Osijek.

7e Yes, through associations and clubs. We all worked on the development of our ideas through local association related to solar energy resources. **I believe that new ideas come from specific people that are deep in the fields and less social than others.**

8e **Doing fun experiments, researching what is in – trends and putting emphasis on learning by doing.**

9e Yes, why not? If you ask us innovators, we would say yes. **Other people will also have to change and adapt. Kids will need to experiment more and learn by making their own findings and conclusions.**

7. Person Interviewed: Ivan Jelušić

Date, Duration, Location: 12.10.2016., 15 minutes, BIOS incubator in Osijek

Gender and age: Male, 25 years old

Language: The interview was originally conducted in English.

Background, Education: When I was 21, I went to work for Goldman Sach in London and I was present at the London School of Economics' alumni meetings, where I learned to work. I have companies now, **but I have big experience in sales and kids' engineering.** I am also

experienced in negotiating, even though I have only high school. My team was 3rd on competition in negotiating in Europe and 7th worldwide.

Function, company and description: the owner and director of company uPlug and innovator. I also have a couple of more companies and I am a director of fund for high risk investments.

Answers:

1f Interesting, I believe that kids need to have a chance to create, but not for the purpose of education. Moreover, I believe that there will be less and less paper and those kids need to be taught to follow trends and technology. There will be a lot of companies on Osijek's market and entering foreign markets will be normal.

2f Of course it can, I also connected disciplines through different knowledge and experience in kids' engineering.

3f No, the future is in temporary employment and freelance industry. Let's take an example of a student that studies law and goes out to the employment market without any knowledge about negotiating that is not good.

4f There is definitely demand, but kids need people with an experience to teach them. It is not enough to finish college and expect a job. Also, the culture negatively influences kids because their parents don't follow trends and didn't manage to comprehend the advantages of technologies. I don't think it is too early to start Tinker Labs and enter the market because millennial generation will understand the value of this kind of program, but we shouldn't

generalize because there are some parents now that would be interested for something like that.

Also, your location is excellent, in the very center of Osijek where upper class parents live.

5f Through research, creative thinking and international experiences.

6f The city of Osijek can do a lot more and there is a lot of potential in Osijek. But, the culture is a problem because our parents still don't understand their kids and don't follow trends. There is a support from the city, but not enough of it. Attitudes toward change of the millennial generation are good, but the attitudes of our parents and of the majority are not – they are still skeptical. But, there is a minority that accepts changes which is enough.

7f Of course, but through practical work and with big will and motivation. Also, there will be more kids included, because everything is changing and they have to be adaptable.

8f Experience and work definitely, college doesn't mean work today. Also, I believe that my generation of millennial would agree with me.

9f Of course it is, there are parents that are aware of changes in technology, advantages of creative thinking and it is not too early to start because everything, also market, changes for the better.

The data above are highlighted in yellow color with no specific reason, besides to make it easier for a researcher to assign it to groups.

The data above highlighted in blue color will be visually represented by the following table “Diversification of Interviewees”.

Interviewee	Background / Education:	Gender	Age	Language
Jovica Hardi	An innovator in food technology and full-time professor	Male	60	Croatian
Krunoslav Weinpert	An innovator and entrepreneur in tourism	Male	44	Croatian
Josip Bartulić	An innovator in engineering	Male	26	English
Sabina Harambašić	Montessori teacher in early education	Female	31	English
Matijas Knežević	An innovator in economics	Male	20	English
Ivan Jelušić	An innovator in engineering	Male	25	English

Manual Coding Results - Parents Based on Focus Group

The following focus group manual coding results and narrative are based on and correspond to the answers below them.

The Manual Coding Results

4. Perceptions about unique S.T.E.A.M. Educational programs:

Positive: 3A,

Negative: 3B, 5B, 3F, 7G, 7H

DNA (Does Not Apply): 3D, 3E, 5E, 5F, 3H

Questions: 2, 3, 5, 7

5. Gaps between current and unique S.T.E.A.M. Programs in Osijek, Croatia

Yes: 2F

No: 2C, 3C, 7E, 3G, 5G, 2H

DNA (Does Not Apply): 2A, 5A, 6B, 7B, 5C, 6C, 5D, 6D, 7D, 6F, 7F, 5H, 6H

Questions: 2, 3, 5, 6, 7

6. Thoughts on Creativity (what is needed to become successful adults):

Related (It is related to children's experiments and/or play): 4A, 6A, 7A, 1B, 4B, 4C, 7C, 4D, 4E, 6E, 1F, 4G, 4H

Unrelated (It is not related to children's experiments and/or play): 1A, 1C, 1D, 2D, 1E, 4F, 1G, 1H

DNA (Does Not Apply): 2B, 2E, 2G, 6G

Questions: 1, 2, 4, 6, 7

The Narrative

The most focus group participants' answers to questions 2, 3, 5 and 7 were negative or do not apply regarding perception about new unique S.T.E.A.M. Educational programs as follows: "I think educational programs for children are good, but I am against putting a burden on children from a young age." "It is still early to start preparing child that is 5 years old for the future of work", "there are many different programs, but I am not forcing my child", "personally, I do not speak with anyone about that kind of subjects, I have no time and kids are anyway overloaded in schools. I love and want that my kids learn as best as they can, but I am not pressuring them with million activities and obligations", "we talk a lot and we are all different and we have different thoughts. Personally, I do not want to look into the future too much, everything changes very fast".

The most answers to questions 2, 3, 5, 6 and 7 indicate there are no gaps between current and new S.T.E.A.M. Educational programs or do not apply: “I did not search for anything else right now, he learns in kindergarten and enjoys spending time with grandmother, listen to her stories and watching what she is doing and he imitates her very well“, “In Osijek there are not many programs and there is no choice, but every learning is good“, “I am not really interested, mine goes to English in kindergarten that is well equipped, I consider that learning English is necessary for the future and they love it.“, “They are still small, I am watching them how they enjoy doing hairstyles for each other, they both say they want to be hair stylists when they grow up, but we will see, there is still time until they grow up“, “for now nothing worries me, there is still time for that“, “she remembers everything, whatever I say to her. She learns in school, at home, and she goes to different activities“.

The most answers to questions 1, 2, 4, 6 and 7 confirm that creativity (what is needed in adulthood) is related to children’s experiments and/or play as follows: “ my child learns best through play“, “ children love to play and I think that they are getting an education and preparation for the future in that way“, “ I talk a lot with friends and they like that their children are involved in different activities, such as dancing, gymnastics, drawing, foreign language schools. Also, it is very important that they play a lot and develop their imagination, to better prepare themselves for the future“, “mainly through play“, “ I think learning through play is great because children are creative and full of imagination“, “ a lot can be learned through playing games and they experiment all the time“, “ for now he learns through play, but we will see in future towards where will their capabilities lean, when they grow up they will change with the years, like all of us. I do not have time to talk with other parents about it and it is too early for that kind of subjects“, “ he learns the best through play, how else can a child be interested“,

“through play and through developing his imagination. My kid is full of imagination, I don't know how to better describe it, he poured the water in flour because he saw that we grownups and grandmother do it. He is already experimenting around the house“, “kids should not be overloaded, only through play“, “he learns the best through conversation and play“, “it is great to motivate kids with some kind of experiments because that way they could become interested for new topics“, “through play kids learn, but my opinion is that kids learn the most by listening grownups and through speech“.

The Answers:

(Age:39 and Above Average Income Level, Marketing Manager)

1.Bojana Šimac

1A. I noticed that my child looks at what the grown ups are doing and she imitates them.

2A. For now, in kindergarten and at home.

3A. I think that a lot of us parents are interested in that kind of programs, but there is none in

Osijek.

4A. My child learns best through play.

5A. Every day, I follow what she is doing and I am trying to find out which skills she naturally

has.

6A. Children love to play and I think that they are getting an education and preparation for the

future in that way.

7A. I talk a lot with friends and they like that their children are involved in different activities,

such as dancing, gymnastics, drawing, foreign language schools. Also, it is very important that

they play a lot and develop their imagination, to better prepare themselves for the future.

(Age:37 and Above Average Income Level, Doctor of Medicine)

2.Martina Vulin

1B. Mainly through play.

2B. He learns the best at home when he is in his own world of Lego-blocks and picture books.

3B. I think educational programs for children are good, but I am against putting a burden on children from a young age.

4B. I think learning through play is great because children are creative and full of imagination.

5B. It is still early to start preparing child that is 5 years old for the future of work, but I am already seeing his affinity towards the building, putting together, constructing, but no affinity towards drawing.

6B. It should be fun.

7B. In terms of the past nothing, but in terms of the future we are starting to include him in activities in kindergarten, and later we will see. Yes, we talk with friends, and the majority of children go to English classes.

(Age:40 and Average Income Level, Soldier)

3.Melita Marić

1C. Mostly in kindergarten, he absorbs in kindergarten, absorbs at home from grown ups and absorbs knowledge from cartoons.

2C. I did not search for anything else right now, he learns in kindergarten and enjoys spending time with grandmother, listen to her stories and watching what she is doing and he imitates her very well.

3C. In Osijek there are not many programs and there is no choice, but every learning is good.

4C. A lot can be learned through playing games and they experiment all the time.

5C. Nothing for now, he is not even five, but I am noticing that he loves acting and imitating others.

6C. While they are little, education should be fun and cheerful.

7C. For now he learns through play, but we will see in future towards where will their capabilities lean, when they grow up they will change with the years, like all of us. I do not have time to talk with other parents about it and it is too early for that kind of subjects.

(Age:38 and Above Average Income Level, Fashion Designer)

4.Brankica Sardelić

1D. With grownups through play and story telling.

2D. He learns the best in nature, he can't concentrate inside the house and in closed spaces.

3D. I am not familiar with it, my child is going to school next year and he did not go to kindergarten.

4D. He learns the best through play, how else can a child be interested.

5D. As far as I see, my kid likes the soccer ball the most and he is repeating that he wants to be a soccer player.

6D. I think it is crucial to interest and motivate children.

7D. Mainly, he is getting an education at home. From activities, he went to German. I do not talk with other parents about education.

(Age:37 and Above Average Income Level, Doctor of Medicine)

5. Melita Polić

- 1E. My kid learns in kindergarten and in the school for foreign languages.
- 2E. He enjoys learning when he is in a good mood.
- 3E. In Osijek there is not really a choice for education, but there are many foreign language schools and good kindergartens where children have fun.
- 4E. Through play and through developing his imagination. My kid is full of imagination, I don't know how to better describe it, he poured the water in flour because he saw that we grownups and grandmother do it. He is already experimenting around the house.
- 5E. For now I did not recognize towards what predispositions he is leaning towards and I can't direct him yet toward any of them. For example, one moment he wants to be a baker and another moment he wants to fly to space.
- 6E. Kids should not be overloaded, only through play.
- 7E. For now nothing worries me, there is still time for that.

(Age:38 and Above Average Income Level, Lawyer)

6. Šatvar Nina

- 1F. He learns the best through conversation and play.
- 2F. He started going to school and he was not thrilled at the beginning. He really liked going on drawing class and in association Drustvo Nasa Djeca, free creative workshops in Osijek, for all ages.
- 3F. There are many different programs, but I am not forcing my child.
- 4F. Children learn best when they are not burdened and when they play alone or with other children, depending on their characters.

5F. For now I am watching what he loves and what is he prone to do, but I am not directing him.

6F. Interesting, training and education need to be interesting for children, and not too tiresome.

7F. Kids should not be overloaded and we should not exaggerate with expectations, and as they say everything in its time.

(Age:39 and Above Average Income Level, Cook)

7.Eva Barišić

1G. I have twins, they are hyperactive, mostly they play together and they learn that way in their own world.

2G. I think they are lacking concentration because of their hyperactivity, mostly at home with older brothers.

3G. I am not really interested, mine goes to English in kindergarten that is well equipped, I consider that learning English is necessary for the future and they love it.

4G. It is great to motivate kids with some kind of experiments because that way they could become interested for new topics.

5G. They are still small, I am watching them how they enjoy doing hairstyles for each other, they both say they want to be hair stylists when they grow up, but we will see, there is still time until they grow up.

6G. We cannot expect too much from our children, we need to let them go so they can develop in their own directions. It would be great if they could do only what they like to do, because there is nothing more beautiful than that.

7G. Personally, I do not speak with anyone about that kind of subjects, I have no time and kids are anyway overloaded in schools. I love and want that my kids learn as best as they can, but I

am not pressuring them with million activities and obligations.

(Age:35 and Above Average Income Level, Lawyer)

8.Sunčica Novak

1H. My girl learns best when I am telling her stories, that interests her the most.

2H. She remembers everything, whatever I say to her. She learns in school, at home, and she goes to different activities.

3H. I think there are not many programs for children in Osijek.

4H. Through play kids learn, but my opinion is that kids learn the most by listening grownups and through speech.

5H. We will see that over time, for now I do not know, I see that she loves animals and caring about them.

6H. Relaxed, fun and no pressure.

7H. We talk a lot and we are all different and we have different thoughts. Personally, I do not want to look into the future too much, everything changes very fast.

The data above are highlighted in yellow color with no specific reason, besides to make it easier for a researcher to assign it to groups.

The data above highlighted in blue color will be visually represented by the following table “Diversification of Focus Group Participants”.

Name:	Age:	Income Level:	Occupation:
Bojana Šimac	39	Above Average	Marketing Manager
Martina Vulin	37	Above Average	Doctor of Medicine
Melita Marić	40	Average	Soldier
Brankica Sardelić	38	Above Average	Fashion Designer
Melita Polić	37	Above Average	Doctor of Medicine

Šatvar Nina	38	Above Average	Lawyer
Eva Barišić	38	Above Average	Cook
Sunčica Novak	35	Above Average	Lawyer