# Statistical Analysis of Students' Interest in Creative Professions in the Czech Republic

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*Abstract*— Creative economy is one of the possible future directions of development of the economy. The authors conducted extensive research among students of secondary schools and universities in the country. The research was focused on the students' interest in creative professions. The authors used the classification of occupations according to Roe, which covers the entire spectrum of professions. The authors found that students often had elected a creative profession, but in addition to them, they were willing to work in completely uncreative jobs. One of the hypotheses tested was the relationship between parents' educational attainment and selected creative professions of their children. However, there was no statistically significant correlation.

*Keywords*— Creative economy, statistical analysis, students' professional aspirations

## I. INTRODUCTION

Creative and knowledge-based economy is used as a synonym for our future and considered as the basic trend of the economy in recent years. There are studies that define and describe the creative industries in different countries [5], [6]. The Department for Culture Media and Sport (DCMS) estimates that the creative industries are one of the most important contributors to the UK economy and defines the creative industries as those "which have their origin in individual creativity, skill and talent and which have a potential for wealth and job creation through the generation and exploitation of intellectual property" [5]. Higgs, Cunningham and Bakhshi [5] examined the relationship of creative professionals and creative industries. The results of their research show that people working in creative jobs do not always work in creative industries. The DCMS estimates that in 2006 there were 800,000 creative jobs outside the creative industries.

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The DCMS also estimates that in 2006 there were 1.1 million people working in the creative industries. Numbers of people working in creative occupations are not the only indicator of the importance of these jobs for the economy. The added value of the creative professions is important indicator, too. Higgs, Cunningham and Bakhshi [5] used the total personal earnings arising from creative employment in the model as useful indicator of economic value of creative work.

HRM processes that help us attract the right staff for the creative industry companies should be carefully monitored and evaluated. Evaluation of these processes are complex, including qualitative variables [8] and can use both objective and subjective evaluation criteria [17]. It is also important to monitor the development of the labor market in specific groups [1]. HRM process should be complemented by an analysis of the cost, as it solves Popesko and Tučková in the area of health services [11]. Protecting intellectual property [9] is a necessary process related to HRM processes for the creative industry. These follow-up processes, however, are not the subject of this article.

This paper examines the question, whether new generation of high school and university graduates will be interested in working in these fields. Some authors concern with the education of students targeted towards obtaining skills in creativity. For example, Moroz-Lapin speaks about this topic in his speech at the conference WSEAS in 2008 [10]. On the other hand, it is necessary to say that the contribution of creativity to the company is relatively hard to measure and he doesn´t deal with financial reporting for SME´s stakeholders - see, for example Strouhal et al.[18] or [19], [20].

An important question that is the core of this article is the students' interest in creative professions. Howard and his colleagues [7] in their study about the career aspirations of over 22,000 8th and 10th grade youth refer that the top five occupations identified by youth as aspirations include artist, lawyer, musician, FBI agent, and actor/actress. The results show that three of the five most popular professions are creative professions (artist, musician and actor/actress). It is important to examine whether older students (high school students and university students) do not lose their interest in the creative professions.

This paper reflects extensive primary research in the segment of high school students in the Czech Republic. Research was conducted in 2011 and it gained an overview of the 1628 students' professional aspirations of all disciplines and types of high schools, 619 students of them chose one of

the creative professions. This primary research in this segment of high schools is completed by a survey of students' professional aspirations at Tomas Bata University in Zlín (338 students of the first year of the bachelor studies, 196 thus 58% of them chose one of the creative professions).

Roe conducted research on career choice [12] or [13], [14]. Classification Roe was used for the purposes of this article [15], [16]. Two-dimensional classification system by Roe in one dimension reflects the skill level and education and in the second dimension it divides professions into eight groups that cover the entire spectrum of economic activities in the economy:

1. Services,
2. Trade,
3. Organization,
4. Technique and Technology,
5. Outdoor Activities,
6. Science,
7. General Culture,
8. Arts and Entertainment.

For the purposes of creative professional research was chosen group No.8 Arts and Entertainment according to Roe. There are other possible approaches, for example Higgs, Cunningham and Bakhshi in their study in the UK [5] use 26 groups of creative professions and they sort profession architect among them. Occupation of architect seems to be a typical representative of the appropriate professions in creative industries - Higgs, Cunningham and Pagan in their study in Australia [6] divide Occupation of architect in more details: Architect, Landscape Architect, Naval Architect and others. Roe sort occupation of architects into group No.4 Technology. Also Bischoff [2], [3] classified architecture as a part of the creative economy in his papers.

One of the sub-tasks of this research is to compare students´ interest in the profession from the group No. 8 with profession of architect, to test suitability of classification Roe for the research of creative professions. Another sub-task of the research is to compare the interest in the creative professions from group No.8 with interest of university students. It allows us to determine the hypotheses associated with an increase qualification level of the survey respondents.

A separate task was to compare the selected respondents opting for creative professions with the highest educational attainment of their parents as one of the possible socio-economic indicators. Its operationalization was through choice of four items (categorization level of education in the Czech Republic) with respect to the termination, namely, the highest level of education "basic" (corresponding category ISCED2 in international classification ISCED), "secondary vocational certificate" (corresponds to ISCED 3), "secondary level" (corresponding to ISCED 3 and ISCED4) and tertiary (ISCED5 and ISCED6). Due to the fact that the highest educational attainment of parents was examined only in a sample of high school students, university students sample was not included in this analysis.

There are many occupational classifications used for theoretical and statistical purpose. These classifications differ mainly in the aim of use. This paper focuses on the professions which show the characteristics of a high proportion of creativity. For this purpose, it is important to find a classification that completely or at least partially distinguishes the creative professions and uncreative profession. Statistical office and Bureau of Labor Statistics use usually the 2000 Standard Occupational Classification (SOC) in many countries, for instance for the census purpose. This classification is updated periodically to meet changing requirements for monitoring labor costs and other needs, for instance differs the white-collar and blue-collar system to be suitable for the Employment Cost Index (ECI). Differentiation of white-collar and blue-collar workers is not typical for the creative professions. Many creative processes require manual physical involvement, but this is not a routine work process typical for blue-collar workers.

Some authors, such as Higgs, Cunningham and Bakhshi [5] refer to "creative industry". For industry, there are separate classifications such as the Standard Industrial Classification (SIC92) - each classification has its specific, advantages and disadvantages. Clark [4] complains that two-digit Standard Occupational Classification (SOC) level with occupational figures for the United Kingdom is not able to determine creative occupation employment.

The International Labor Office (ILO) updates the International Standard Classification of Occupations (ISCO). Earlier ISCO-88 has been replaced by a newer ISCO–08. Although the conceptual model underpinning ISCO-08 remains essentially the same as that used in ISCO-88, there have been some changes in the way the model is used to design the classification. The most notable change is that, since the nature of the work performed has been given more emphasis than the formal education and training required in determining the skill level of an occupation. Dimension characterizing the nature of the work is very important and can help distinguish the creative professions from uncreative professions. On the contrary dimension characterizing formal education is probably less important to distinguish creative profession. Very interesting, however, is the combination of creative economy and knowledge economy. The intersection of the two bases can provide the desired increase in productivity together with unexpected innovations. For this reason, we cannot underestimate the dimension that characterizes the level of formal education, and give it to the background of interest. For this reason it is important to monitor the educational aspirations of respondents and educational attainment of their parents. It is one of the signals that can show whether creativity can have knowledge connections.

The basic idea of this research was to offer high school students a structured overview of professions covering the whole cross-section of professions typical for the Czech labor market and examine their choice of career focus (horizontal dimension), and educational aspiration resulting from the chosen level of the profession (vertical dimension), and

identify possible discrepancy between the expectations of students and existing conditions. Thus built research required the selection of the appropriate classification of occupations - preliminary research realized in the autumn of 2010 explored the employment classification according to the Czech Statistical Office (KZAM-R). This classification has been recently replaced by a new classification CZ-ISCO, corresponding to the latest international classification of employment. This classification accentuates vertical dimension strongly emphasizing the skills and competencies, but from the perspective of horizontal coverage professions typical for the Czech labor market this classification is not illustrative and motivating for high school students, because these students have minimal ideas about the world of work. Much more user-friendly for students is the classification of professions according to Roe, who works with the horizontal dimension (professions) and the vertical dimension (qualification). Original classification according to Roe, which is based on U.S. conditions of the second half of the last century, was adapted for the purposes of research presented in the current conditions of the Czech labor market and qualification requirements for each profession in accordance with the National system and the National Qualifications Framework in The Czech Republic.

For the purpose of this paper is, however, necessary to say that both these classifications don´t focus on differentiation of creative professions and uncreative professions.

Classification of Occupations according to Roe is nearest to the division on creative professions and uncreative profession by pursuing a separate occupational group No. 8 Arts and Entertainment. Professions representing this group are very close to the definition of creative industries, as it is written by the Department for Culture Media and Sport - DCMS includes among the creative professions the art profession and sports profession. On the other hand, many professions included in the other groups by Roe also have a high proportion of creativity. A typical representative of such profession may be "architect", who is in the occupational group No. 4 according to Roe, but Higgs, Cunningham and Pagan in their study in Australia [6] rank it among creative professions.

Authors consider this issue to be very important, because economic ambitions of creative industry subjects are significantly conditioned by the quality of available labor force.

First results showed a strong ambiguity of students, who are interested in creative professions. This may mean that students can work in non-creative industries after graduation. Paper gives background and partial recommendation for systematic work in this segment of education and labor market.

## II. PROBLEM FORMULATION

Research of creative professions of candidates in the segment of high schools in the Czech Republic (age range 16-19 years) and comparative sample of first year university students (age range 19-21years) examine the professional aspirations of survey respondents. To obtain representative results, it was used an electronic questionnaire in which 800 Czech high schools of all types were approached. Teachers received guidelines about careers and they allowed students to fill out anonymous questionnaire via the Internet. Students were motivated to fill out questionnaires to obtain feedback about results and so they could compare their results with the peers. Type representatives were selected in each of eight groups according to Roe. Type representatives included cross-section of skill levels from completely unskilled labor to highly specialized and scientifically oriented job. Pretest conducted with a group of high school students at the end of 2010 and 2011 showed that this classification is well understood by high school students and they are able to express their expectations and perceptions about their future profession. The questionnaire survey was conducted in 2011 (from January to December).

The questionnaire survey was conceived as a complex – it offered to students 62 types of professions across the whole spectrum of economic including the information about the required education and salary range in the Czech Republic for each profession. In the questionnaire was also information about proportion of each professional groups in current working structure in the Czech Rep. (almost fifty percent of jobs in the Czech Rep. are in the industry; proportion of workers in the group No 8 Arts and Entertainment is very small – nearly 1%).

This allowed students to get a good overview about the possibilities of application in practice in the Czech Rep. and complex information for their decisions about choice of a profession that interests them. Students could choose more professions, which most of them did (332 students did not select any profession; 216 students chose only one job).

Research team compared statistics of whole group of respondents (1628 high school students) with sample of respondents, who chose at least one job from group No.8 Arts and Entertainment by Roe (619 high school students).

The questionnaire survey conducted in the segment of university students in the form of printed questionnaires in autumn 2011. Also this survey was anonymous and teachers prepared presentation about current working structure in the Czech Republic for students. In the questionnaire there were 48 professions across all 8 groups by Roe, however, only the appropriate academic qualifications (there were no profession with lower qualification than the university level). 338 respondents took part in the research, 196 of them chose at least one job from the group No 8 Arts and Entertainment by Roe. Students could select more jobs, which all did.

Classification according to Roe has included creative professions in the group No 8 Arts and Entertainment. The profession „architect", which also requires a high degree of creative activities is included in group No 4 Technique and Technology.

### III. RESEARCH QUESTIONS:

Q1: What are the most commonly chosen professions by creative students?

Q2: Is there a relationship between student's choice of profession "architect" and choice of other creative professions from the group No 8 Arts and Entertainment?

Q3: Has the highest educational attainment of parents any influence on their children in choosing a career from the eighth group by Roe (arranger, photographer, dancer and choreographer, sports coach, designer, actor and worker in advertising) or the architect's profession?

Q4: Is there a relationship between the choice of the analyzed occupations (arranger, photographer, dancer and choreographer, sports coach, designer, actor, worker in advertising and architect) and educational attainment of parents?

### IV. PROBLEM SOLUTION

The first task of this study was to verify, whether a relationship exists between choice of „architect"- from the group No 4 „Technique and Technology", and choice of creative professions from the group No 8 „Arts and Entertainment". The research team theorized that architect is a creative profession, and this relationship could exist. It was examined whether students whose choice of profession was formed from at least 20 percent by professions from group No 8 „Arts and Entertainment"(we define creative student as one who choose at least 20% professions from the group No 8) chose the profession "architect". Figure 1 shows a histogram of profession choice by high school students. Height of columns reflects the frequency of the monitored variables. It means how many high school students chose how many creative professions. This means that 243 students chose at least one creative profession i.e. 39%. All seven of seven professions were chosen by 9 students. Based on the above, research team divided the students into two groups a) creative students whose selective sample was made up of at least 20 percent of the professions from the group No 8; b) other (students, who chose less than 20% of the creative professions and students, who chose any creative profession).
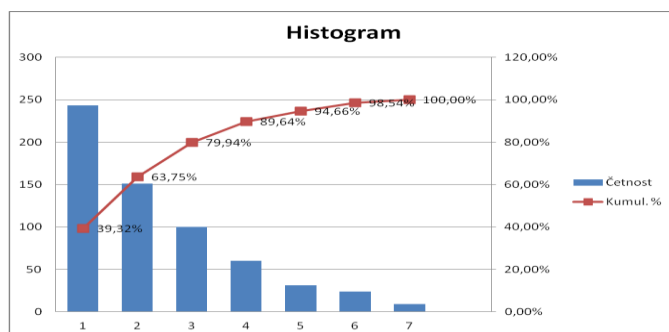


Fig. 1 Histogram – frequency of preferences of professions from the group No 8 (high school students)

Authors used chi-square method to determine the dependence. This hypothesis was formulated for further statistical purposes:

H0: Preference of profession architect is not dependent on inclusion of student to the group of creative students or non-creative students (other).

Based on this hypothesis, alternative hypothesis was formulated:

H1: There is a correlation between inclusion and preferences.

Firstly students were divided into two groups – creative and other. Then they were divided according to the preferences to profession architect.

| | Architect | | |
|---|---|---|---|
| | YES | NO | Total |
| Other | 84 | 1095 | 1179 |
| Creative | 67 | 382 | 449 |
| Total | 151 | 1477 | 1628 |

Table I. Calculation of chi-square

Sixty-seven students from the group of creative students chose the profession architect. Other creative students (382 high school students) did not choose the profession architect. Eighty-four students from the group of non-creative students (other) chose the profession architect. H0 was rejected by chi-squared:

$$(\text{X-squared} = 22.5763, \text{p-value} < 0.05)$$

Relationship strength measured through Kendall coefficient is 0.1201, so it weak direct dependence.

Calculation showed the dependence of relationship between creative students and the profession "architect". Therefore rejected H0 and accept H1.

Figure 2 shows other preferences of creative students. Besides professions from the group No 8, creative students most often chose these professions: branch manager, lawyer, psychologist, business manager, redactor, minister and architect.
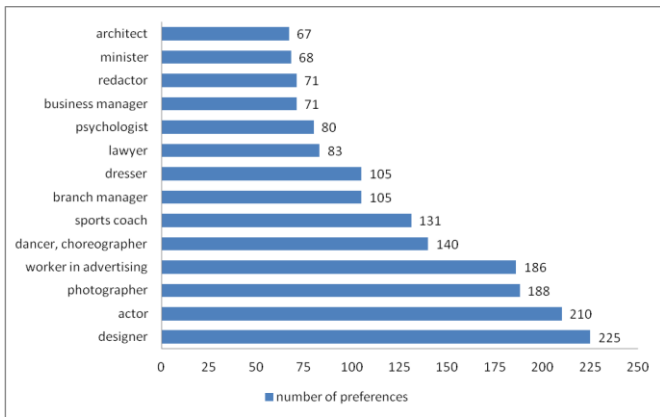
Fig. 2 Preferences of creative high school students

In another part of the research, research question Q1 was also examined with the sample of university students. University students received a similar questionnaire as high school students, but with selection of professions for which they need university education.

Figure 3 shows a histogram of university students. Height of columns indicates how many university students have chosen a certain amount of creative professions. Seventy-six percent i.e. 258 students chose at least one creative and 7 students chose all five professions.
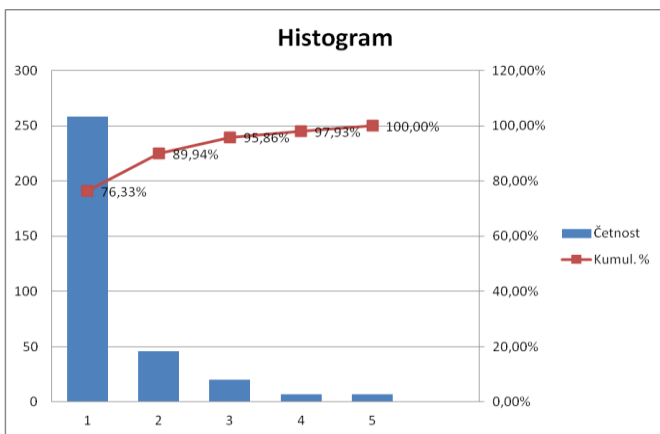


Fig. 3. Histogram – frequency preferences of professions from the group No 8 (university students)

Figure 4 shows preferences of creative students in the first class of Faculty of Management and Economics, Tomas Bata University in Zlín. Besides professions from the group No 8, creative students most often chose these professions: manager of a company, service manager – tourism, service manager – hospitality, manager of manufacturing firms, marketing services – profit sector. Students could not choose profession architect, because this profession was not in the choice of professions. For this reason, research question number two has not been tested.



Fig. 4: Preferences of creative university students

In the last part the research team engaged in the ratio of creative students in both samples (high school and university students) and compared them.

|  | High school | University |
|---|---|---|
| Creative students | 449 | 99 |
| Other | 1179 | 239 |
| Total | 1628 | 338 |
| Ratio of creative | 0.28 | 0.29 |

Table II. Ratio of creative students

Table II shows the number of creative students, other and the total size of sample on which the research was conducted. The test of proportions does not show significant difference in proportions on alpha = 0.05 level, as can be seen from corresponding confidence interval -0.07 and 0.04. As a result, we can conclude that there is no difference.

Research question 3 examined the effect of educational attainment of parents on their children, who had chosen creative profession.

H0: Highest level of education of parents has no influence on the choice of profession by respondents.

The authors tested the possible relationship between the variable "Highest level of education of the parents' and occupational choice (eighth group + profession of architect). The authors included in the analysis respondents who expressed interest in a given occupation, not the total number of choices made. Due to the nature of the data was chosen nonparametric Kruskall-Wallis test H. The result is the following.

| Professions | |
|---|---|
| Chi-square | 5.057 |
| df | 3 |
| Asymp. Sig. | 0.168 |

Table III. Kruskal Wallis test of effect of parental educational attainment on their children, who had chosen creative profession

The results show that there was no statistically significant influence between the two variables. We must retain the null hypothesis, while we can say that the level of education of parents had no influence on their children choice of creative professions (at least for our sample).

Research question 4 examined whether there is a relationship between the choice of creative professions and educational attainment of parents.

H0: The achieved level of education of the parents does not affect their children choice of creative profession.

The authors included in this analysis all the choices made by all respondents. We examined the relationship among all the choices made by all respondents for each occupation and level of education achieved their parents. Due to the nature of the data was elected the association coefficient Kendall tau-c for the analysis of possible existence of a relationship (as well as to determine its strength and its direction).

The relationship between occupational choice and made by the highest educational attainment of parents came out statistically insignificant in the case of the architect's profession, arranger, dancer and choreographer, sports coach, designer, actor, and worker in advertising. A statistically significant relationship was found between the profession photographer and level of education achieved ($\tau=-0.05$, $p<0.05$). Direction of the relationship is negative, that is, with a higher level of education of parents their children choose this profession less. However, given the relatively low strength of the relationship is the significance of the found relationship and its direction rather insignificant.

## V. DISCUSSION AND CONCLUSION

This paper shows that new generation of high school and university graduates is interested in working in creative sectors of the economy in the Czech Republic. At the same time, research shows that students are not decided yet, because they chose both creative and uncreative professions to their portfolio.

Research team used two-dimensional classification of professions by Roe, because this classification is highly transparent and intuitively arranged for students. Research also showed, that the breakdown of professions by Roe is not entirely clear for research purposes, because as a creative appears other professions outside the group No 8 „Arts and Entertainment", too. Authors tested the hypothesis that creative students from high schools have a relationship of dependence to the profession „architect", which is included into the group No 4 Technique and Technology. For this research, we define creative student as one who choose at least 20% professions from the group No 8 by Roe. Statistical hypothesis testing confirmed the relationship of dependency. This statistical testing could not be performed on a sample of university students, because the profession "architect" was not included in their questionnaire.

Furthermore, authors dealt with other preferences of students from high schools and Tomas Bata University in Zlín. As mentioned above, preferences of students are very ambivalent. Besides the creative professions and architect, creative students from high school have chosen more often - branch manager, lawyer, psychologist, business manager, redactor and minister. For these professions the minimum requirement of education level is bachelor or master degree. These professions have a better salary. On the other hand, for the majority of creative professions the minimum requirement of education is apprenticeship or graduation. Also salaries are substandard for the creative professions. It means that, students were not influenced by salary and the minimum requirement of education while they filled the questionnaire.

In this online questionnaire, students saw share of employment in national economy sorted by Roe. Creative students chose the profession from the group No 8 (Arts and Entertainment), even though these professions have the lowest share of employment and it is only one percent. The question is, whether the style of education had an impact on students and their ambivalent. To have few children in the family is today´s trend. It means enough money for their education. Parents prefer higher education for their one child. Parents build high self-confidence in their children and it is perhaps the reason why then children are ambivalent. Children with high self-esteem think they can work in any position in all specializations.

Another trend is the fact that most of today´s graduates do not work during their studies. Maybe the reason is lack of jobs in a specific field. Students often see that their parents work at a different position than they studied for. It may be also the reason why they are unfocused.

Besides professions from the group No 8, creative students most often chose these professions: manager of a company, service manager – tourism, service manager – hospitality, manager of manufacturing firms, marketing services – profit sector. Questionnaire for university students included only professions, for which they need university education. That´s why university students are not unfocused as high school students are.

In the next part of the research, the research team dealt with proportion of creative students in two samples (high schools and university students) and then research team compared these samples. Research has shown that the proportion of creative students is comparable in both samples

and it is approximately one third. This can be considered as a good starting position. Students also chose uncreative professions in a high percentage. This means a high risk that students can find a job in the non-creative area and creative potential of students will not be realized. Here is a great area for future targeted activities of the educational system and for cooperation between schools and firms. It is important that creative students found the application in practice.

In the last part of the research the authors examined the relationship between parents' educational attainment and choice of creative professions by their children. Statistical analysis of the data revealed no influence of parents' educational attainment on the respondents who chose a creative profession. One possible explanation for this lies in the ambivalence of high school students themselves, as we have seen above. If respondents generally chose a profession not only independent of their similarity (similar working procedures, similar areas of interest, etc.), but also independent of the degree of necessary skills (see above), it would be understandable that even the highest level of education of parents as a guideline when selecting profession is not statistically significant.

Statistical analysis of data up to one case revealed no influence of educational attainment of parents on their children's choice of creative professions. The case, in which this influence was found, was an occupation photographer and this relationship was negative. Due to the low strength of the relationship, however, this result cannot derive serious consequences.

The presented research has shown that students' interest is not the only condition for their successful entry into the labor market. Companies in the Czech Republic should be able to better assess and measure the added value of the creative professions for their business and profit. Higgs, Cunningham and Bakhshi [5] used the total personal earnings arising from creative employment in the model as useful indicator of economic value of creative work – this is another factor of success, because higher earnings are strong motivation.

Creative occupations are highly competitive - competition selects the most successful, both among employees and between self-entrepreneurs. Less successful creative employees should be able to find employment in the labor market in jobs with a lower share of creative activities. The increasing share of creative work in the economy will signal the growing potential of the economy.

This paper presents only part of the research, because the data obtained from respondents - high school students throughout the Czech Republic and university students TBU in Zlín - was comprehensive and covered a whole range of other issues. Very important was the question of educational aspirations of students (creative and uncreative) - the vast majority of students is directed to a bachelor's degree education [21]. This direction brings the Czech students to average educational aspirations in Europe.

The high interest of students in tertiary education in the Czech Republic remains sufficient. Research has shown that interest of students in creative professions fits together with interest students to attain the highest level of education. It fits well into the concept of linking the creative economy and knowledge economy.

Significant changes can bring the planned introduction of tuition fees at public universities. This topic is very important for the whole Czech society and its future, but this topic is also very sensitive, because all levels of school education, including universities, have been the last 60 years in the Czech Republic for free. With the transition to the market economy in the 90's of last century private colleges with payment of tuition fees have begun to emerge, but in the overall school system in the Czech Republic private universities are still marginal in scope and only in certain fields (business, management, marketing, etc.). It is difficult to evaluate the quality of provided educational services, but in the consciousness of the Czech population there are public universities which guarantee a high level of education and for free, while private universities have sticker of nonstandard level of education.

Effective combination of creative economy and knowledge economy has a chance to solve the problems of young generation, which has large unemployment problems in entering the labor market. In the Czech Republic, increasing numbers of university graduates who cannot find work. And situation in southern European countries where youth unemployment is up to 50% is unbearable.

Czech Republic has a competitive advantage because it is relatively strongly oriented to industrial production and there are traditionally high-skilled workers. These initial conditions should be developed in the direction of the creative economy while maintaining the trend of achieving a high level of education. Developing creative professions in traditional industries (group of professions No.4 Technology by Roe) may be in the direction that will help address sustainable economic development for the next generation. The research presented in this paper is concentrated on the intersections of traditional branches of industry with creative potential of emerging young generation. The young generation has relatively strong representation of creative students (high school students and university students in the Czech Republic have one third of creative students according to the methodology presented in this paper). This is the potential that we need to develop and utilize.

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