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**THE VISION OF STUDENTS  
REGARDING TOMORROW'S WORLD  
IN EUROPEAN ENGINEERING EDUCATION**

**1. INTRODUCTION**

In the paper “Managing tomorrow’s people”, published in 2007, Michael Rendell (Rendell, 2007, pg. 4-6) together with a team of specialists from PriceWaterhouseCoopers outlined a future world on three coordinates. Starting from the idea that the future “is not a place we go to, but one we create”, using the scenario method and questioning almost 3000 generation Y representatives – graduates from USA, China and the UK, that represent the generation that just enters the labor market – in order to test their vision and expectations on the future of work, researchers have decided on the future of management in 2020.

In brief, they talk about the coexistence of three worlds, where technology, globalization, demographics and other factors will influence the organizational structures and cultures. The created scenarios emphasize three models for the organizations of the future:

- Large corporations will turn into small states and will assume a prominent role in the society;
- Specialization will lead to an increase of cooperation networks;
- Environment programs will impose fundamental changes on business strategies.

As a result, we talk about a series of radical changes of the business models, which will have as a result:

- The lack of borders between professional and private life, companies being the ones that will assume ever increasing responsibilities for the social wellbeing of employees;

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- Using advanced methods for evaluating individual capacities, to control and monitor productivity and performance of employees;
- The increasing importance of social capital and work relations, these becoming driving forces for business success.

The three worlds, defined as: Blue, Green and Orange will coexist in one form or the other, maybe distinct by geographical region or industry sector (Figure 1).

These being the forecasts made by Michael Rendell and his research team, let's see what the opinion of our young specialists is, students still in universities, integrated in engineering education bachelor programs at the Academy for Science and Technology AGH in Krakow, Poland, the Technical University in Kaiserslautern, Germany and the Faculty of Engineering from the "Lucian Blaga" University in Sibiu, Romania (Duse 2010).

The research was conducted by accepting the three worlds anticipated through the scenario method by the British researchers and questioning a number of 162 Polish students, 648 German students and 211 Romanian students.

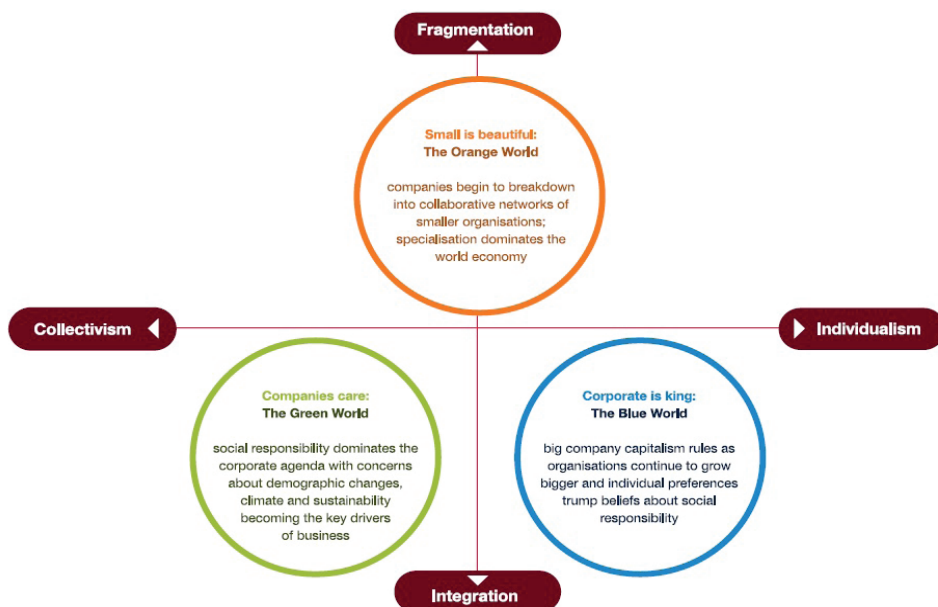


Fig. 1. The three future worlds

Source: Rendell, M. (2007) Managing tomorrow's people. The future of work to 2020, PricewaterhouseCoopers LLP

## 2. RESEARCH ON TOMORROW'S WORLD IN EUROPEAN ENGINEERING EDUCATION PROGRAMS

The test group was a number of 162 students from the Academy for Science and Technology AGH in Krakow, Poland, 648 students from the Technical University in

Kaiserslautern, Germany and 211 students from the Faculty of Engineering at the “Lucian Blaga” University in Sibiu, Romania.

The objectives of the research are:

- Defining the way today’s engineering students see tomorrow’s world, in the context of globalization and the current economic status;
- Setting the main coordinates of this future world;
- Interpreting the implications on leadership, in relationship with the current situation.

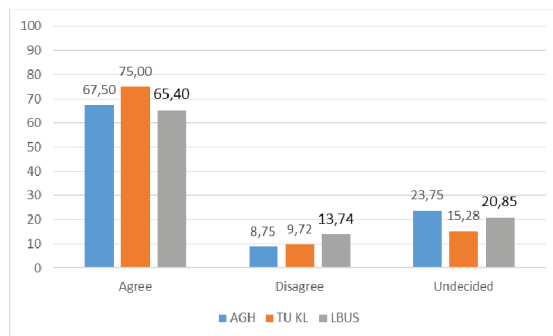
The starting hypotheses for the analysis can be formulated as follows:

- Engineering students realize to small extent the changes that will appear in the labor market in the next 10 years;
- The lack of flair in interpreting the main problems in the labor market are caused, mainly, by the fact that the majority of students do not work and, in turn, have to little contact with the labor market;
- There is a certain conservatism in the way students think, by promoting some ideas about the future which overlap the current situation.

The students’ prejudice towards the changes that will take place on the labor market in the next years will not influence the received answers.

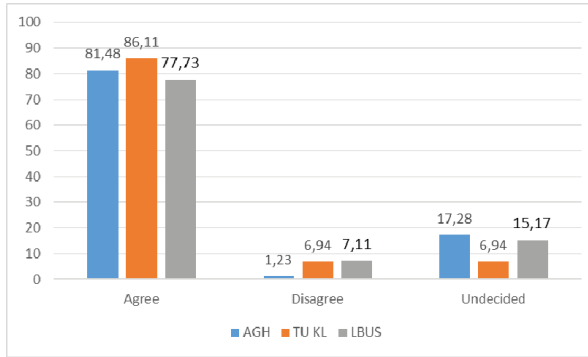
The analysis of the answers was made by university and through correlations between the questions of the first two objectives and the classification factors.

Thus, with 67.5% of the Polish engineering students, 75% of German ones and 65,4% of Romanian ones agree that they will work outside national borders more than their parents (Figure 2). This percentage doesn’t surprise us, because Europe is currently open for young qualified engineers, they are welcomed everywhere and accepted with the right to free practice.



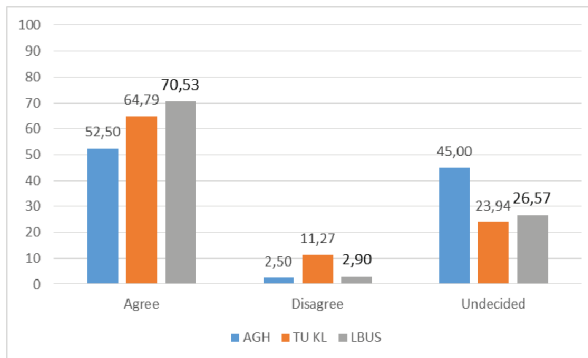
**Fig. 2.** Do you think you will work outside national borders more than your parents?

Regarding the language they will use at work, the majority favored a different language than their mother tongue (81.48% of Polish, 86.11% of German and 77,73% of Romanian students). This highlights their trust set in big, multinational companies that will offer them jobs that will take them working in an international environment (Figure 3).



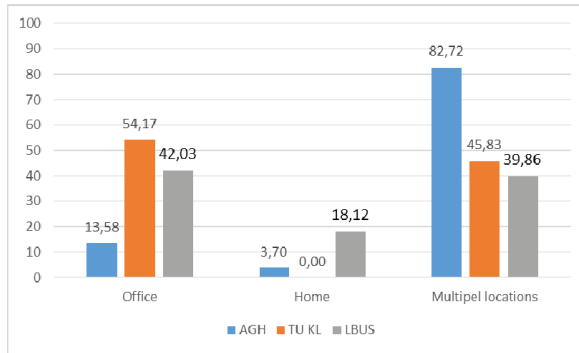
**Fig. 3.** Do you think you will use a language different than your mother tongue at work?

By analyzing the next item of the questionnaire, the idea of accepting for the future of employers whose corporate social responsibility actions match the individual values of those questioned is only welcomed by 52.5% of the AGH students, while German students are slightly more sensible to the social corporate responsibility agenda of their employer with 64.79%. Romanian students show a great sensibility (70,53%) to their future employer’s corporate social responsibility (Figure 4).



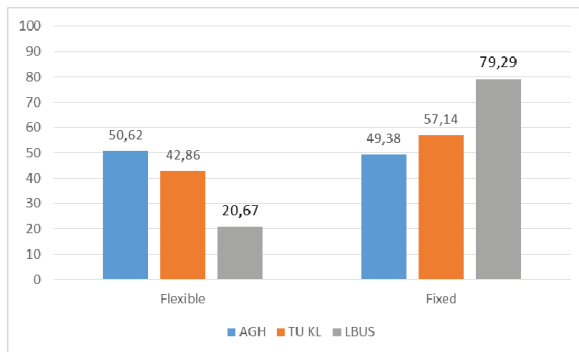
**Fig. 4.** Will you deliberately seek to work for employers whose corporate social responsibility behavior reflects your own values?

While questioned about their desired place to work (at home, at the office or in multiple locations), Polish students have a high desire for flexibility and to work from multiple locations (82.72%) while the German students wish for a fixed working location, the company’s office (54.12%). It is very interesting to notice that none of the German students and a very small percentage of Polish students (3%) expressed their desire to work from home. Romanian students are quite balanced between working from an office (42,03%) or from multiple locations (39,86%) (Figure 5).



**Fig. 5.** Do you think you will work mainly from...?

Surprising is the optics of youth regarding working hours (Figure 6). While Romanian engineering students show a clear preference (79,29%) for fixed working hours, Polish students have only a marginally higher preference for flexible working hours (50.62%) and German students have a slightly greater preference for fixed working hours (57.14%).



**Fig. 6.** Do you think your office hours will be...?

General opinion regarding the number of work places during active life is of 2 to 5 jobs (64.20% of Polish students, 73.24% of German students and 76% of Romanian students). We notice an important segment of Polish students (18.52%) who believe they will have 10 or more employers over the course of their active life (Figure 7).

In analyzing the age at which students want to end their career, a vast majority of the German students (84.72%) see themselves working until after they turn 60, while 64.2% of Polish students and 68.6% of Romanian future engineers want to retire from active life before the age of 60.

The last item of the questionnaire analyzes the option of becoming your own employer. A great percent of interviewed German engineering students (66.67%) declared to be against this idea, while almost half (48.75%) of Polish students declared themselves in favor of

managing their own destinies. Romanian students show the highest desire (75.40%) to be their own employers (Figure 8).

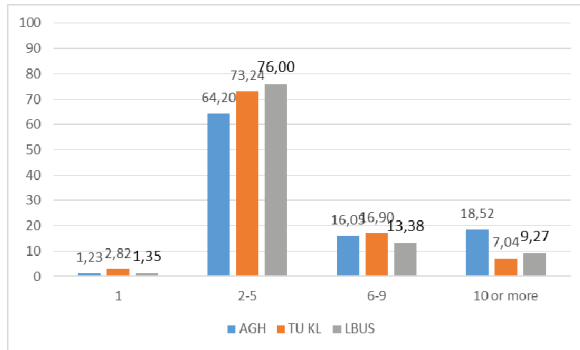


Fig. 7. How many employers do you think you will have during your career?

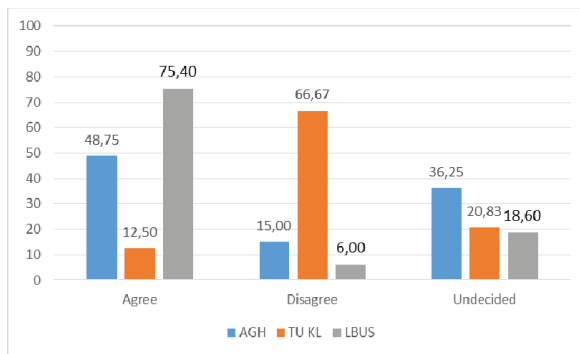


Fig. 8. Do you think about opening your own business, being your own employer?

### 3. THE OPINION OF EUROPEAN ENGINEERING STUDENTS ON POSSIBLE DIRECTIONS OF LEADERSHIP OF TOMORROWS' WORLD

British researchers talked about the fact that it is possible that all three organizational models will coexist. This fact is strengthened if we look at the options expressed by interviewed students, whose ages mainly fall in the 20 – 25 years interval.

Thus, a look at the German and Romanian student's answers reveals the hypothesis of the Blue World. The wish for stability and regularity is visible for them, manifested through a fixed working program, somewhere in a company office, without great fluctuations regarding the working place and with a long active career that goes beyond the

age of 60. They are willing to work for large corporations, corporations that will strive, besides offering a work place, to take upon them problems regarding career construction and personal development, meaning all components of the superior level of Maslow's pyramid.

Amongst signals found in the students' answers, the idea of a Green World is vaguely visible. This, of course, does not exclude it, but certainly, at least at this point in time, the Green World has no link to graduates from either Poland, Germany or Romania. Although they mostly said that they will opt for employers whose corporate social responsibility behavior will reflect their own values, further on, with other answers, students did not characterize this world. The percent of those imagining, even at an ideational level, one job for life is very small in the total of respondents.

The Orange World seems to have supporters amongst students in Poland. The idea of portfolio careers, of guilds that will manage their professional paths but also the educational ones is one that is enjoyed by Polish students, who mostly want to work flexible hours, from multiple locations; they want to have fast careers that allow them to retire at a young age in order to pursue their hobbies.

An important segment of Polish students, but also some Romanian future engineers dream of managing their own destinies, and the guild will be the interface they need in order to accept the best offers.

Currently, a form of these "guilds" is already active. We see that online recruiting is winning more and more ground. Advertisements for open jobs posted on Twitter, Facebook and LinkedIn currently supplement traditional job offers. In companies that need to cut down costs, these recruitment platforms are a solution for replacing traditional ones.

What conclusion can be drawn from this radiography of future options of students in Poland, Germany and Romania?

First of all, most of them seem to know how their future should look like. While most of the German and Romanian students see themselves in a position to repeat the professional paths of their parents, meaning paths that were valid some 20-25 year ago, Polish students have a different vision for their professional paths, favoring mobility, flexibility and fast careers that allow them early retirement.

#### **4. CONCLUSIONS**

The initial hypothesis regarding the low level of awareness students exert towards changes is only partially confirmed, in the sense that German and Romanian students are mostly focused on the current state of the art and following career paths that were valid for their parents, while Polish students are more aware of changes that will take place on the labor market in the future (Nemes2013).

The next hypothesis is confirmed in the sense that an important segment of interviewed students (89.7% of Polish students, 60% of German students and 72,80% of Romanian students) do not work or work only occasionally. We also notice the conservatism of a way of

thinking fixed on the current state of the art for the German and Romanian students, which, paradoxically, is neither happy nor promising.

How does this affect the leadership in European engineering education? Change is the only certainty we have about tomorrow's world. And this change must be the result of collective thinking and not the result of one single thought, of the "providential man", in whose existence no one believes anymore. Thus, the accent should be shifted from the leader to the team.

Leadership in universities cannot be assessed only in relationship with itself, but it must be involved in an economic, social and political context at national and international level. It is clear that universities cannot be an island in an ocean, even more while European societies register strong mutations with long term effects on the economic, social and political life.

"Our choices show us who we really are, more than our abilities", as famous novelist J.K. Rowling affirms. Thus, the option of the European technical universities must be one of helping students discover their own values as well as choices that motivate them, in order to help them decide on their own.

Someone who will be a leader in tomorrow's world will certainly not possess enough knowledge to tell others exactly what and how to do. The rhythm in which the world will change will be way to fast and no single person will be so advanced as to keep up with change on their own. Leaders will have to involve others and to obtain their participation for tasks that will be too complex and the information too vastly spread for leaders to solve the problems on their own (Schein, 2004).

Organizations that promote learning will play a very important role in tomorrow's world. These organizations will have to be led by people who embrace learning as a constant behavior in their daily agenda (Senge, 2006).

Leadership must always direct its view onto its people, because knowing who you are is the first step in becoming better than you were (Maxwell, 2008).

Here is where we need to see and understand the role of leadership for any university, in forming these organizational learning behaviors that constitute a real *modus vivendi* for the organizations of the future. In this context, the situation in which a university becomes a branch of a major corporation or it is only the "raw material" supplier is only a matter of group choice.

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