

"KNOWLEDGE. CREATIVITY. INNOVATION." SYMBOLS OF THE POSTINDUSTRIAL AGE.

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Abstract: This article is dedicated to our country's first symposium "Knowledge. Creativity. Innovation." as a scientific expression, initiated by the University of Ruse in concordance with similar initiatives already implemented in the contemporary world of post-industrial era.

Expressing gratitude to the organizers of the International MTM Congress, we would like to offer this publication as a scientific message of representatives of the academic community rather than as a programming manifesto, not only with a comprehensive analysis of knowledge, creativity and innovation in the knowledge economy in postindustrial society, but also as an opportunity to share specific ideas and solutions in the field of creative and innovative university education.

Keywords: KNOWLEDGE, CREATIVITY, INNOVATION, ORGANIZATION OF KNOWLEDGE, HIGHER EDUCATION, CREATIVE AND INNOVATIVE TRAINING.

1. Introduction

"Cursed be he who waters the desert."

Fr. Nietzsche

Nowadays words such as "Knowledge" and the adjacent "Creativity" and "Innovation" are often used as emblematic symbols of post-industrial era. They are habitual, even rendered commonplace, but when it comes to them, today's higher education could not always boast unconditional success. Something is lost between their understanding and effective implementation.

There is a situation that recalls the words of the Polish scientist Leopold Infeld in the preface to a joint popular science book with Albert Einstein: "Einstein thinks that starting a book with "Dear reader" makes it a popular science book."

Not trying to be connate with the coryphaei of scientific knowledge, it would be useful to look in turn to the essence of the characters already cited, because they are related to their place and tasks in the field of higher education in an extraordinary era saturated with a dynamic, competitive, competitive spirit.

1.1. Within the permanently changing global economy

We will streamline several key ideas of the ancestors of the knowledge economy, such as Alvin Toffler, Karl Popper, Peter Drucker, etc.:

1. Currently, economy is driven by knowledge and the economies of postindustrial society require individuals standing out with individuality and ability to think creatively and effectively, not easily interchangeable, asking questions and seeking answers, taking certain entrepreneurial risks, creating novations (renovations and innovations), such as new products, services and intellectual solutions, utilizing their unique knowledge.
2. Economy itself as well as newly forming human society change their social form - a logical consequence of the formation of a society of knowledge with knowledgeable workers as the most powerful specialized workforce.
3. The sector of intellectual labor covers a wide range of professional labor oriented towards highly rather than less and average intelligent products. Furthermore, this highly intelligent ideology proposes a new concept of knowledge where the most important form of ownership is not material but ultra symbolic - knowledge.
4. The demand is growing for highly intellectual products, services, technologies and solutions that discover previously unknown opportunities, possibilities and perspectives to organizations and individuals, carriers of knowledge, that create new kind of knowledge, transforming it into intellectual property.
5. Knowledge and its inexhaustible information, images, symbols, values and culture is turning into a factor of production and a central economic resource.

6. The driving force is demassified production, reaching down to miniaturization - small batches of customized products, thus providing market opportunities for small or even individual market players.

7. The true value of organizations lies in: Their ability to strategically and operationally acquire, generate and disseminate knowledge; Their staff's ideas, knowledge, information and innovation; Their corporate arrays of databases and patents.

1.2. Challenges that face the knowledge economy itself

1. The economy of goods and markets is retreating and gives way to the knowledge economy and knowledge migration. Knowledge is replacing economic criteria, such as "land, labor and capital" as the main sources of economic development and prosperity. And the economy based on knowledge produces by knowledge and sells knowledge on the market, transforming the latter into a market of knowledge. Moreover, this process is enhanced by the potential of the Internet. Technology of knowledge turns into a predominant and dominant social and political power, and creativity and innovation, being carriers of knowledge, are firmly anchored in business and management.
2. Knowledge as a product of the search for truth grows into a systematic need to search and create new hypotheses, theories, methodologies, strategies, methods, techniques and means of creative and innovative reproduction of knowledge itself. And as an important consequence, any problem solution reveals/creates new unsolved problems, making the "Knowledge - Problem - Solution" chain immanent to evolution and progress.
3. Whilst growing as a factor, the category of "knowledge workers" is characterized by new features and perspectives, prophetic of new profound changes. Being self-updating individuals, they need an effective system of obtaining specialized training and systematic renewal of knowledge through continuing education and Lifelong Learning. They perceive their work as a new way of life. They obtain higher personal status and social security in addition to financial security. They become "citizens of the world".
4. The society of knowledge, in turn, forms and shapes the knowledge economy and gives life to a new type of organization, characterized as a **"learning organization"** - by Peter Senge, and in ascending order, also as **"fast companies - knowledge organizations"**.

1.3. Knowledge defines the prospect of intellectual entrepreneurship.

In this aspect, only a few basic ideas will be mentioned of the famous strategists of the knowledge economy, such as Peter

Senge, I. Nonaka, H. Takeuchi, Thomas Davenport, Leif Edvinsson, Thomas A. Stewart, etc.

1. Knowledge is a factor in raising corporate viability, sustainability and corporate longevity, playing the role of "anti-stress" and anti-risk factor. It becomes a key resource and determines the characteristics of highly competitive organizations and individuals in an environment of uncertainty, non-guaranteed success, as well as problematic opportunities of success or failure.
2. A new perspective is revealed - of **intellectual entrepreneurship** related to the idea of the learning organization, of establishing a corporate creative and innovative centers and universities, of creative management as a system and means of knowledge management.
It is estimated that intellectual entrepreneurship could grow into holistic entrepreneurship as an attribute of the human brain, human thinking, human creative and innovative energy.
3. The knowledge organizations build intellectual models to compete each other in the fields of: Generating ideas; Managing and implementing ideas; Profiting from the sale of ideas and knowledge; Maximizing the commercial capabilities of ideas; "Fresh" ideas, rich in appeal; Ideas that could be a source of competitive and market advantages.
4. The knowledge organizations effectively utilize knowledge and human intelligence, creating a rich share of intangible assets. Their dominant strategy is to identify and capitalize on the potential of structural, human and consumer capital, i.e. on everything related to the creation, protection and capitalization of intellectual property.

1.4. Knowledge and creativity unlock and stimulate innovation.

The symbiosis of creativity (creative thinking) and knowledge reveals opportunities for several types of innovation:

(1) **Innovation** resulting from a given market/economic sphere. Usually it does not change the function and basic characteristics of the products and creates new categories or markets.

(2) **Innovation, which originates from outside a particular market.** It is also regarded as the product of Edward de Bono's lateral thinking, and as a consequence of Philip Kotler's horizontal innovation strategy for lateral marketing.

(3) **Transfer of knowledge and information** - from one area to another, in its three main varieties: simple, variable, contrasting.

(4) **Vertical innovation based on knowledge**, leading to inventions, protected industrial property, copyright, know-how.

Key causes and sources have been detected and analyzed, playing the role of typical barriers to innovation:

1. Understatement of market information, technology, qualified individuals, the experts' recommendations.
2. Weakness or failure of creative and innovative training, attitudes and skills as a consequence of:
 - (1) Creative-innovative inefficiency of the entire chain of the educational system.
 - (2) Psychological positions and inertia, leading to passivity and blunting entrepreneurship.
3. Academic inertia, inefficient higher education, underestimating the advantages and benefits of creation, protection and capitalization on intellectual property as a priority component of intangible assets.
4. Unsatisfactory general level of cultural environment and cultural surrounding being content with less creative and innovative capability.
5. Organizational inertia and lack of care for creation and innovation in organizations, particularly in non-dynamic (Slow) companies.
6. Stressful economic situations and risks.

2. Assumptions and ways of addressing the problem

We will define a set of several postulates for establishing a system of creative and innovative university education based on knowledge (including information), based on the principles developed by K. Nordstrom and J. Ridderstrale and others.:

2.1. Creation of highly intelligent products, services and solutions, distinguished by their exceptional efficiency and profitability is impossible without knowledge.

2.2. Knowing is not a sufficient condition if effective creative and innovative thinking with the potential of the two hemispheres of the brain and respectively, of formal logic and intuition (imagination, fantasy) is not developed.

2.3. Key challenges which creative and innovative training in the economy based on knowledge is facing are:

- (1) Extracting individuals from the area of inertial comfort.
 - (2) Nurturing a perceived willingness to overcome complexities and stress of heavy loads, focusing on the sources and means of knowledge and information, introducing and leading the first generations of the age of the Internet employees in the knowledge economy.
 - (3) Building an intangible network of value, including the formation and utilization of human, structural and customer capital.
 - (4) Identifying, attracting and encouraging talent.
- 2.4. Creative and innovative training and practice related to knowledge must consider that:
- (1) Anybody excels the others in doing something, respectively, in knowledge, know-how, skills. But perseverance for absorption and specific application of knowledge in a given area is also necessary.
 - (2) No one could achieve perfection in multiple areas of knowledge.

2.5. Knowledge is a short life product and must be permanently updated and enriched. Therefore:

- (1) Working with knowledge is no "seasonal" and campaign but permanent.
- (2) Any knowledge becomes obsolete, hence the need for permanent learning and acquiring something new and different.

2.6. Creative and innovative art is not limited to discovery and possession of an idea. It requires and activates an arsenal of intellectual skills: Identifying problems, possibilities and perspectives; analysis and synthesis of new products, services and solutions; modeling and stimulation; implementation, testing and experimentation; creative, professional and business decision making, etc.

3. Solving the scientific problem

The main task arising from the author's thesis is a critical analysis of creative and innovative training and practice based on knowledge in the present higher education system, particularly in Bulgaria.

3.1. There is no recognition, discussion and defining the need for knowledge, creativity and innovation in our country.

There is no dialogue and socio-economic order of prospective/large-scale research, innovation, creation, protection and capitalization on intellectual property.

This is directly or indirectly testified by data known from statistics:

- (1) In the period around and after 2008 the Patent Office of Bulgaria has deposited about 300 applications for patents for inventions annually.
- (2) Bulgaria is around and below the level of the smallest economies in the world by number of registered patents.
- (3) For the period 2006 to 2010 Bulgaria has around 30 Europatents.
- (4) The Summary Innovation Index for 2003 and 2004 is 0.30 at 0.60 to 0.80 for the developed economies.

- (5) The level of software piracy in 2004 is 71%, Bulgaria followed only by: Romania (74%), Russia (87%), and Ukraine (91%).
- (6) Only 16% of all enterprises in Bulgaria have developed innovation for the period 2002 to 2004.
- (7) Upon formation of the market price of Bulgarian companies just under 1% accounted for intangible assets, the actual rate in the world being 70-90% or more.

3.2. Universities produce in good faith scientific publications with priority upon acquisition of scientific degrees and titles.

Generally, they do not have intellectual property rights as applicants or authors and do not capitalize on their intellectual potential, nor participate in the exchange of intellectual products. They do not have a developed/operational concept and strategy for the creation, protection and capitalization of intellectual property, neither do adequately discuss the issue.

3.3. Both practice and university education do not encourage entrepreneurship and market-oriented thinking.

Nihilism is rampant - with no vision, motivation and goals. Studying is for degrees with no coverage, and the state rests silent, thereby encouraging.

People are prepared for a world long gone. Subjects that are unnecessary for the practice of modern knowledge economy are being studied over others.

With few exceptions, in practice students learn creative thinking and innovation on their own by the principle: "A fool learns from his own experience."

3.4. It is true that bright minds in the country react critically to the fact that Bulgarian universities lack systematic training in creation, protection and capitalization on intellectual property.

Yes, all in all (despite some indisputable initiatives) it is lacking, but just because it has no foundation due to the absence of basic systematic training as well in strategically important subjects, such as: creative thinking, creative and innovative strategies and techniques; systematology including modeling and problemology; transfer of knowledge and information; horizontal (lateral) and vertical innovation; principles of synergy and holism; genesis and evolution of fast companies - knowledge organizations; creative management - knowledge management; intellectual property - creation, protection and capitalization, etc.

3.5. Higher education simply remains a debtor in creating a quality echelon of young creative and innovative potential, so needed on both personal and public level for prosperity in the knowledge economy.

It remains unclear as to how our obscured status quo could be changed absent the vital wave of creativity and innovation.

4. Results and discussion

Regardless of the fact that the status quo as described savors negativity and disappointment due to clear stagnation on national level there are enough examples of proactivity in attitudes, actions and decisions in the "big" picture.

A "good academic location" in a creative and innovative aspect without undervaluing the efforts and achievements of others, is the University of Ruse.

The author of the present thesis and concept could confirm that assessment himself and together with his research team by providing a brief description of creative and innovative solutions introduced in training:

1. **A creative and innovative "Descartes" system with an Ego-centered hexagonal model of effective creative thinking** (Figure 1) - of training and practical professional application meeting high criteria and standards. It serves as a methodological basis for creative and innovative training as referred to below.

2. **Subjects that are introduced in the education of Bachelor degree students:**

- (1) Methods of Creation - Part 1 and 2.
- (2) Marketing of Intellectual Products.

3. **Subjects that are introduced in the education**

- (1) Methodology/Fundamentals of Scientific Research.
- (2) Transfer of Knowledge and Information.
- (3) Marketing Philosophy of Design - Part 1 and 2.
- (4) Creative Management and Intellectual Property

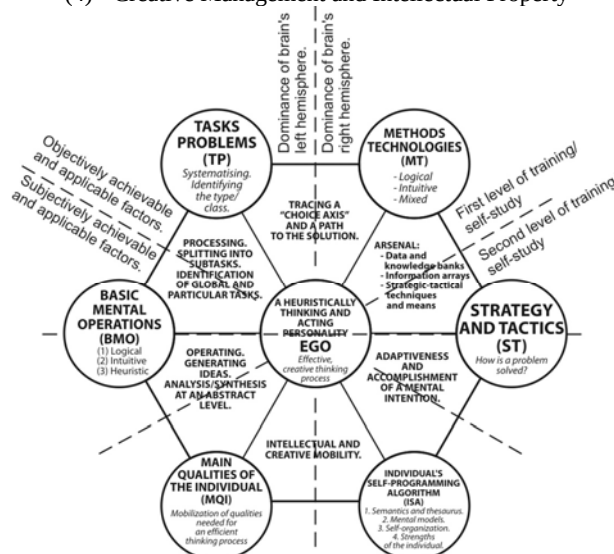


Figure 1. Ego-centered hexagonal model of effective creative thinking in generating ideas, synthesis of new solutions (products, mental models, etc.) and business, management and creative decision making (by N. Orloev).

4. **"JUNIOR" business incubator** - for MA degree students from the "Industrial Design" course, established in April 2002 as an educational and practical range with the objective of:

- (1) Forming young researchers and inventors.
- (2) Forming an entrepreneurial spirit along with paving the road from PRE-entrepreneurship to entrepreneurship.
- (3) Developing and step-by-step implementation of an author's **"Project of my life"** motivated by a high and bold Objective.
- (4) Creating an original product along with its implementation, registration and patenting.
- (5) Developing a personal marketing project or company.
- (6) Preparing, reporting and printing an original scientific article.
- (7) Incorporation in real economic and market environment.

5. **"Creative and innovative techniques"** - a specialized course with 30 hours of lectures for graduate students (PhD students).

6. **"The university lecturer. Mission and duty at the Alma Mater."** - a 4-hour introductory lecture for young lecturers with up to 5 years academic experience.

7. Comprehensive database of books, educational and methodological aids, examples, solutions.

5. Conclusion

The subject of "Knowledge. Creativity. Innovation." offers an intransitive wealth of opportunities and challenges. It opens a creative arena for the academic community with a worthy mission and vision for a breakthrough. Other positions and roads lead to the painfully familiar swamp of logorhea and resigned "equalization in poverty."

This article will be completed in turn by another thought of Fr. Nietzsche **"The cause gives birth to its creator."**

When a person seeks and finds his cause, it really makes him a creator!

May this symposium bring all our academic community lessons and wisdom in order to help Generation Y - our students discover and rediscover their cause, and take upon the mission of creators through knowledge, creativity and innovation.

Translated from Bulgarian by Yavor Popov,