

HIGHER EDUCATION FOR THE KNOWLEDGE ECONOMY

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Abstract: Higher education is rapidly analyzing and generating alternative concepts and strategies for change and adaptation in an uncompromising era of knowledge economy both globally and nationally.

This study is based on comprehensive and selective research of ideas, strategies and solutions tracing evolution which have been proposed by the most influential contemporary thinkers of The Thinkers 50 stature. It puts forward a vision and methodology, the better part of which has been designed, systematically updated over time and tested in the University of Ruse, Bulgaria.

Keywords: KNOWLEDGE, KNOWLEDGE ECONOMY; STRATEGIES FOR EVOLUTION IN THE EDUCATIONAL SYSTEM, HIGHER EDUCATION, CREATIVE AND INNOVATIVE TRAINING.

1. Introduction

"If we are serious in our intentions to transform education, we must understand the time we live in and capture the new wave. We could either catch the wave and go into the future or let it flood us and sink back into the past.

The stakes for education and anyone going through it could hardly be higher. "

Ken Robinson

Two books are the subject of our analysis of the knowledge economy. The first is "The Element: How Finding Your Passion Changes Everything" by the world-renown education system methodologist and member of **The Thinkers 50** - Sir Ken Robinson and Lou Aronica, published in 2008.

The second book - "Higher Education in the Rear View Mirror of the Knowledge economy", published in 2012, which I have the honor to present as a co-author, offers the vision of a team of three generations.

In Ken Robinson's view, the education system - international and national - is facing a dilemma. One possibility is giving preference to a model with guaranteed quality where everything is standardized, but not particularly "healthy".

The other model of quality assurance has defined criteria for perfection but without any instructions and guidance on how the system should respond to them. That depends on the factors involved, their intentions or ability to best meet the above criteria. The experts would evaluate the results not by standards, but based on the correlation between what should be done and what the final result looks like. The problem is each national system being unique and different.

One of the key problems facing the today's education system is that in most cases it adheres to the model of quality assessment based on standards whilst it should be oriented towards the future prospects of education, which are not ones of group thinking and standardization but of individualization and development of deep and dynamic human abilities.

It is Ken Robinson's belief that future education should be **Elemental**, i.e. realize the model promoted by his "**ELEMENT**" of encouraging the feeling of self-discovery, awareness of one's true nature and personality and what to do with one's life.

The **Element** has two features to be in conformity with:

1. **Ability** - a natural skill for something and an instant attraction of something - how it works and how you use it.
2. **Passion** - a sense of pleasure and passion.

The **Element** requires two conditions to be in harmony with:

1. **Attitude** - our personal view of ourselves and everything around us.
2. **Opportunities** - favorable circumstances, situations and chances that allow us to know what our capabilities are and how far they could take us.

We respectfully recognize Sir Ken Robinson's ideas, developed, implemented and tested by him and his contemporaries in the system of secondary education for decades for two natural reasons. On the one hand, a model such as the "**Element**" is a

sustainable basis for improving the quality of higher education. Secondly, there are a compelling number of cases of successful personal realization - by different people in different countries and at different times - tested for quality in search of the optimal assembly of the "**Element's**" components.

Our study focuses on similar ideal ideas, but already in higher education in the 21st century knowledge economy.

2. Assumptions and ways of addressing the problem

The model presented in this study is in turn directed to ensuring the quality of higher education in the era of knowledge by defining criteria for perfection but without any standards. It takes into account the existing visible and hidden aspects, trends and factors, both objective and subjective, but already not just of and by traditional academic principles and compelling imperatives of the only authority, being also insufficient and inefficient in an era of radical change in the paradigm (the model) of postindustrial society.

Expected changes could not be achieved by academic principles only without approaches uncompromisingly defined by the modern knowledge economy itself - both globally and nationally. Academism and the knowledge economy are bound to help each other, facing an unparalleled "big" picture with specificities we painfully know and feel:

1. Driving forces, events, and a future suddenly come upon us - bare of ready concepts, methodologies, strategies, scenarios and means.
2. The "**Third Wave**" of postindustrial society - that of knowledge, creativity and innovation, of constant changes in an environment of chaos, turbulence, ambiguity, randomness, and uncertainty.
3. Lack of alternatives of knowledge and constant demand for its management, marketing, reproduction, and capitalization.
4. Substantially new human generations and creative intelligence.

3. Solving the scientific problem

Seven general approaches/key views can be applied to draw an adequate "big" picture of higher education in the knowledge economy:

1. Education System and Higher Education. How is higher education perceived in the rear view mirror of the knowledge economy.

Above all, we would like to share the metaphor of the knowledge economy as a sports car flying down the highway to the future with the silhouette of a 20th century school-bus disturbingly receding in its rear view mirror.

Associations arise on the background of this metaphor which are not particularly enthusiastic, especially when it comes to our national higher education system.

1. We vegetate in the timelessness of "historical societies" in which everything is reduced to the past and is correlated with and resolved in the past.
2. Our Renaissance spirit and our idol - education - are part of an irrevocable past. It's a new and different age.

3. The education system and education policy are not a key priority of society and the state, regardless of the in-depth research and analysis of leading Bulgarian and foreign scientists.
4. There is no paradigm (model) for higher education in the era of the knowledge economy in the 21st century.

II. "Designing the Future" in the Spirit of Synergy, and the Chaos and Self-organization Theory Respectively.

The main idea of this very important technology is analysis and construction of scenarios and strategies for genesis and evolution of events, processes and complex systems and organizations and assessing their likelihood as well as developing controlled impacts to direct events, growth and development in the desired direction taking into account factors such as:

1. Synergy (self-organization) of open nonlinear systems as human mind and education system itself actually are.
2. Calculating the unprecedented challenges of postindustrial society and the knowledge economy fully realizing the thought:

"What you have succeeded in, you won't prosper with."

Marshall Goldsmith

3. Dominant and polarized ideas and strategies in the economy driven by knowledge.
4. New views of evolution and progress of the most influential thinkers alive, The Thinkers 50, now 123 Guru's, selected by the world in 2001-2011.
5. Virtual synergy on the market - first in training and later in reality - of the representatives of the younger generations newly integrated in it on the basis of their timely and proper introduction to PRE-entrepreneurship (-enterprise respectively) as a system for transition to genuine entrepreneurship.

III. Objective Laws of the Nonlinear World of the Knowledge economy with Special Emphasis on Genesis and Evolution, Taking into Account:

1. Building an organizational culture of emotionally bound individuals - managers, employees, customers, clients, suppliers, etc.
2. Applying the principles of "The Fifth discipline" by Peter Senge of the Learning Organization - what it should learn and do:
 - **Systematic thinking.**
 - **Personal Development.**
 - **Mental models.**
 - **Building a shared vision.**
 - **Team learning.**
3. Building communities and organizations generating knowledge along with finding the place of information and knowledge in learning as well as of Lifelong Learning.
4. Strategy and technology of substantial growth of organizations to **fast companies - knowledge organizations.**
5. Building and implementation of system and means of creative management - for knowledge management.
6. Formation of a new leading figure in the knowledge economy - the General/Corporate Knowledge Strategist.
7. Building corporate creative and innovative centers, incl. corporate universities, including active use of the potential of existing universities.
8. Creation, protection and capitalization of intellectual property.

The aspect in question leads to the following conclusions:

- (1) The paradigm (model) of needs of learning in real life is changing, leading to a review of the concept of the education institutions.
- (2) Education is becoming a weapon in the competitive struggle (both between individuals and

companies/organizations) and the workplace is turning into a university.

- (3) The intensity of training of workers is much greater than that in academic institutions.
- (4) Effective creative and innovative and strategic thinking is being developed and is expected and stimulated at all levels in the organization.
- (5) New strategies based on knowledge are being developed. An illustrative example and confirmation could be found in the strategies of C. K. Prahalad (1943-2010), former № 1 among **The Thinkers 50** in 2007 and 2009.
 - **Competition for the future** - competition for the markets of the coming decades.
 - **The future of competition** - creating and shaping the market as a forum for co-creation of values and experiences.
- (6) The human factor is being placed and treated in the light of the latest modern psychology and sociology theories and models.
- (7) A new **fifth generation of leaders** is rising. This is a factor that could not be ignored as people expect, seek and find their leaders in every age.

IV. Identification, Encouraging and Developing of Key Personal Qualities of the Human Factor Needed for Successful Navigation in the Knowledge economy with Emphasis on:

1. A system of detection and developing personal strengths as a major intellectual resource with three dimensions (by Markus Buckingham):
 - (1) **Talent** - long-lasting patterns of thinking, perception and behavior.
 - (2) **Knowledge** - acquired by training and personal experience.
 - (3) **Skills** - steps in taking action.
2. Updating, developing, review and disposal of mental models of personality.
3. Identifying, developing and enriching the role models and functions of personality.
4. Creating, encouraging and modeling a marketing type of personality.
5. Identifying and stimulating development and improvement of the team roles of personality, incl. use of Meredith Belbin's test.
6. Adopting and implementing useful and valuable models of creative and professional qualities and habits.

V. Appropriate Messages and Encouraging the Younger Generation (Especially Generation Y - 20-25 Years) by Taking it to Stimulating Opportunities and Prospects.

1. Adding to the personality's innovation experience by adoption of creative and innovative ideas and theories of successful individuals and organizations, as well as by selective utilization of best practices and cutting edge world experience.
2. Redirecting the view and personal energy to enterprise, and entrepreneurial spirit respectively, entrepreneurship, innovation and creative business, and towards successful self-fulfillment and prosperity.
3. Understanding the business of the future - in the knowledge economy - including by the stimulating principles and strategies of K. Nordstrom and J. Riderstrale.
4. Search of development and perfection in a particular field of knowledge and practice - where the personality may stand out as the best by looking for "**slots**" - by Seth Godin's effective system.

5. Implementation of the basic principles of conceptual, practice-oriented, and professional realization strategic platforms, like Donald Trump's, directed to:
 - Decision making on long-term success.
 - Systematic adoption of new knowledge and skills.
 - Adoption of effective market thinking, behavior and action.
 - Finding and communicating with mentors/tutors.
6. Preparation and adoption of knowledge, skills and qualities - with job prospects and career in an exclusive modern organization.
7. Targeted incorporation (adaptation) and systematically making contacts in the reality of the knowledge economy, following the inspiring recommendations and vision of successful individuals and organizations.

VI. Defining the Mission, Functions and Tasks of Younger Generations, Particularly Generation Y, on the Way from the University to and into the Knowledge economy Organizations, Taking into Account the Following Factors: Tolerance; Adaptation; Conflicts.

1. What should we all know about Generation X ("the no logo generation") - 20-25 to 40-45 years?
2. What should we all learn and know at all costs about Generation Y (20-25 years) as it is here yet and entering the workforce?
 - What and how do they think?
 - How could we help them most usefully and effectively, so that we could expect a future that we wish?
3. How do modern tribes occur and how are they lead by motivating and binding ideas - by Seth Godin and others?
4. Symptoms and effects of becoming unsociable as a social pathology syndrome.
5. Modern university and educational system built on the principles of creative and innovative training for the knowledge economy, including:
 - (1) Disappointment in the university and in practice by the standards of the dominant system of prescribed quality of education.
 - (2) The modern university's alternative of self-elimination or survival, being under the influence of old paradigms.
 - (3) What are the ways and means of overcoming the lack of knowledge and skills, and STEM-skills (Science, Technology, Engineering and Mathematics) in particular?
6. Useful and recommended concepts, strategies, principles, programs, means and players for drawing a new vision and "big" picture of higher education in the knowledge economy, incl.:
 - Discussions and forums in academic education environment.
 - Content, forms and style of dialogue and learning.
 - New courses, new training disciplines.

VII. Systems, Methods and Means of Creative and Innovative Teaching at the 21st Century Knowledge economy University. Here we would like to point out two large-scale projects of the University of Ruse, ready to be shared with any potential partners aiming at exchange of advanced experience.

1. A "Descartes" system and an Ego-centered hexagonal model of effective, creative, and innovative thinking.

An Ego-centered hexagonal model of effective creative thinking in generating ideas, synthesis of new solutions (products,

services, etc.) as well as of creative managerial and business decision making has been introduced in training since 1985 with permanent updating and improvement - Figure 1.

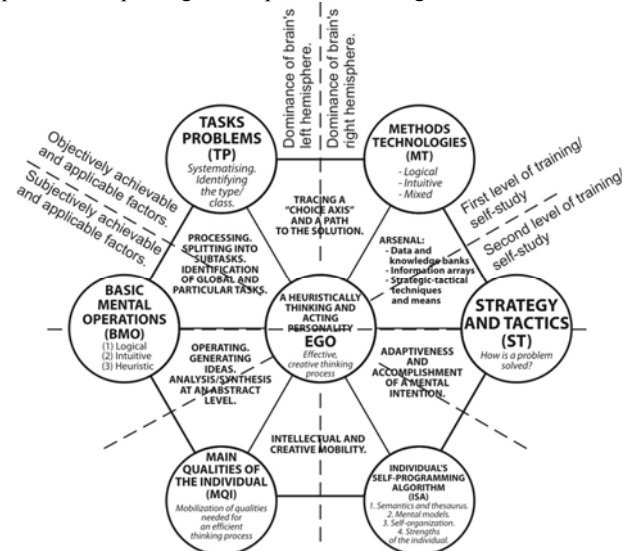


Figure 1: Ego-centered hexagonal model of effective creative thinking in generating ideas, synthesis of new solutions (products, mental models, etc.) and business, management and creative decision making (by N. Orlov).

Essentially, the Ego-centered hexagonal model of effective thinking is an original system for optimum implementation and utilization of the brain's creative potential and of the neural network respectively, by integrating creative and innovative capacities and resources of the left hemisphere, i.e. of formal logic, as well as of the right hemisphere, intuition respectively, incl. fantasy and imagination.

2. A serious game for creative and innovative training.

An interdisciplinary research team has been established and operating at the University of Ruse with the permanent task in time of creating a serious game for creative and innovative training based on the "Descartes" system and the Ego-centered model of effective creative thinking under discussion.

4. Results and discussion

This study provides opportunities for discussion in three key areas:

4.1. Regarding the concepts developed in our author's book "Higher Education in the Rear View Mirror of the Knowledge economy" presented in summary [1].

4.2. Regarding the "Descartes" system and the Ego-centered hexagonal model of effective, creative, and innovative thinking. Teaching by creative utilization and implementation of the Ego-centered hexagonal model of effective creative thinking ensures achievement of adequate creative and innovative level needed to solve a variety of creative activities:

- (1) Continuous building and development of creative and innovative Ego, characterized by creative thinking and effective action.
- (2) Generating ideas, hypotheses, theories, methods, and methodologies.
- (3) Developing new products, services and intellectual solutions.
- (4) Synthesis of new creative and innovative solutions and strategies.
- (5) Developing visual and verbal images and pictures.
- (6) Establishing effective communications and presentations at different levels and "languages" of semantic information.
- (7) Making creative and effective management decisions.

Multiannual successful, seamless testing in teaching different subjects and in real creative professional practice has clearly and convincingly illustrated the high digestibility, relevance and effectiveness of the "Descartes" system and the Ego-centered model in particular as an adequate means for solving various types of creative and innovative problems and tasks.

Based on that a concept and strategy for serious game for creative and innovative education are being developed at the University of Ruse [2].

Game Based Learning supports personalized training and the acquisition of basic and key skills. Moreover, universities and students are not only targeted users of serious games. They are also an environment and creators of new generations of serious games for the important category of young creative and innovative personalities.

Arguments in favor of university education, based on games:

- (1) Improving the knowledge and skills of students in short terms.
- (2) Better understanding of individual roles, knowledge and effectiveness of behavior in specific situations.
- (3) Engaging students by motivating them and increasing their activity for a long period of time.
- (4) Increasing the efficiency of social interaction between students and professors.
- (5) Serious games have proved to be a simple and reliable way of reaching people as well as finding and attracting young talents.
- (6) Serious games have also proved very suitable for business practices such as corporate training, because they encourage strategic and economic thinking.

5. Conclusion

The aim of the present study is not to give advice and recommendations but to build a "big" picture of modern knowledge economy with fast companies - knowledge organizations with the role, functions and tasks of modern personality in them.

The task at the basic hierarchical level is related to building interuniversity shared vision and strategy by which each university would establish and undertake specific strategies, programs, resources and players.

Failure to enter into the realities of economics, marketing, entrepreneurship, organizations, management, personology, etc., means to ignore the "big" picture with the system of higher education being built and set up one-sided - only from the viewpoints of its dominant vision and concept, i.e. mainly based on fragments only of the global "big" picture of the knowledge economy. Therefore, thinking in the "big" picture is appropriate.

The importance and strength of the argument for improving the responsiveness of education to the needs of the market by training in specific skills and general competence, such as adaptability, creativity, entrepreneurship, etc. is growing.

Moreover, the result is a unidirectional urge to modernize the technology and methods of training and teaching. It could significantly increase the effectiveness of education providers in assuming their new responsibilities for providing training and education leading to real employment and competitive efficiency.

"The times of change do not offer the contemporary university big chances of revival, unless it changes and adapts to dynamically changing processes in the world of postindustrial society.

If you do not change, then you die!"

Sergio Zyman, Vice President of
Marketing, The Coca-Cola Company

Which university could hope to be a happy exception?
Such optimism would be an unacceptable lack of foresight.

6. Literature

1. Orloev N., H. Beloev, Y. Vassilev. Higher Education in the Rear View Mirror of the Knowledge economy, Ruse, Publishing Center at the Angel Kunchev University of Ruse, 2012, p. 119
2. Orloev N., H. Beloev, K. Enimanev, Y. Vassilev, K. Dzhurov. Methodological Principles of Serious Games In: Machines, Technologies, Materials 2011, 8th International Congress, Proceedings Vol. 3, 19-21 September 2011, Varna, Bulgaria, pp. 130-133
3. Robinson K., Lu Aronica. "The Element: How Finding Your Passion Changes Everything" Sofia, Roy Communication, 2010. p. 266

Translated from Bulgarian by Yavor Popov,