



TREATING THE CONCEPT “INTELLECTUAL MOBILITY” AS AN INTEGRATED CHARACTERISTIC OF FUTURE PROFESSIONALS

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Abstract. The article considers mobility as an essential development factor for professionals and identifies the place of intellectual mobility in the hierarchy of various dimensions of mobility. The genesis of the concept ‘intellectual mobility’ has been deduced. Here we show the necessity of the development of this integrated characteristic (quality) that provides the ability of future engineers to change quickly the types and forms of intelligence activity without reducing its efficiency and productivity. The structure of intellectual mobility and its main components (intellectual capabilities and personality traits) are given. It is stated that the development of intellectual mobility should be guided by the structural model of intelligence developed by M. Kholodnaya.

Key words: mobility, intellectual mobility, intellectual culture, Bologna Process, European Area in Higher Education, Information Age, personality, intellectual capabilities, personality traits, engineering education.

Introduction

The accelerating pace of technological change is bringing a number of new challenges for professional and personal lives of modern people. The Information Age with its free access to information anywhere, at any time and from any device, has led to an increasingly connected world with a knowledge-based society. Engineer education specialists in universities around the world have been taking major efforts to recognize the issues that may affect the quality of engineering education to meet the demands of modern society. The Bologna Process, intending to create the European Area in Higher Education, leads to total re-organization of the higher engineering education system in Europe resulting in new ideas about competencies recognition.

The concept of mobility is more and more becoming an essential development factor for professionals, which is considered now “not only as a “plus”, but an obligation” (Michel, 2006, p.46). Mobility of students and staff, being under serious considerations, is at the core of the Bologna Process, but understanding of this concept is not limited to physical mobility, that is to traveling, studying and working abroad. Besides the diverse mobilities of people, objects, images, the mobility of thoughts, ideas, methods, etc. is important as well. Mobility is becoming more “virtual”, forcing people to work locally but think globally. In other words, the concept of mobility is getting a new modern meaning allowing us to say that stimulating the mobility of minds is the key issue for the educational programs in the future (Michel, 2006).

There are different dimensions of mobility, which accounts for the number of research performed by the scientists in the fields of social studies, economics, psychology as well as education. One can mention the study of mobility in the system of human capital (O. Bilyk, 2009), the study of social (B. Barber, 1957; N. Kovalisko, 1999; J. Urry, 2000), sociocultural (I. Vasilenko, 1996), academic and professional mobilities (L. Goriunova, 2006; I. Shpektorenko, 2012; A.H.W. van der Zanden, 2009).

In educational investigations, mobility is considered as an important characteristic of future professionals in various domains (E. Ivanchenko – professional mobility of economists (Ivanchenko, 2005); A. Vaschenko – that of future officers (Vaschenko, 2006); N. Kozhemiakina – of agrarians (Kozhemiakina, 2006); L. Merkulova – of future engineers (Merkulova, 2008); R. Prima – of primary school teachers (Prima, 2010). It is noteworthy that in the 21st century there appeared educational studies on the development of various dimensions of mobility, for example, social and professional mobility of students in the educational environment of university (Moryliova, 2001), personality mobility of future professionals (Kotmakova, 2005), virtual mobility of university teachers (Tyrtuy, 2009), informational mobility of agronomists (Nelepova, 2011). L. Khorunzha (2009) researches the methods for the development of intellectual mobility in

high schools students. However, the problem of intellectual mobility of future engineers is still open for further scientific investigations.

The Information Age characterized by globalization and by the appearance of knowledge-based economy as well as living in instable environments has set new requirements for the qualification of an engineer, his culture and intelligence levels. An integral part of an engineering education process is providing students with opportunities to develop individual qualities and skills that will help them to face the new situation with positive attitude. Among them is intellectual mobility in its modern meaning – the ability to change quickly the types and forms of intelligence activity without reducing its efficiency and productivity.

So, the goals of this paper are: a) to deduce the genesis of the concept 'intellectual mobility' and identify the place of intellectual mobility in the hierarchy of various dimensions of mobility; b) to determine the structure of intellectual mobility and analyze its main components to ensure further investigations on this issue.

Method

To achieve the goals of our scientific study the methods of theoretical search (comparative analysis, classification, synthesis, etc.), conceptual analysis, interdisciplinary synthesis, observation, and empirical analysis were used.

Results

Mobility is a key word, an essential concept. It is certain to be associated with adaptability, flexibility, interactivity. The analysis of scientific investigations of mobility in different fields of science shows that understanding of this concept is gradually expanding: in addition to physical mobility of people, objects, images and mobility of thoughts, ideas, minds, there comes understanding of mobility as the quality, as “the most general characteristic of the individual’s readiness for qualitative changes in life” (Bilyk, 2009, p.9).

The issue of flexibility and mobility of professional characteristics of engineers is crucial not only due to global economy, but also because, at present, it is almost impossible to predict the demands of our society for these or those professionals. According to V. Popkov and A. Korzhuev (2004, p.300), in developed countries only 20% of employees work following their qualification got in youth, and 42% of young specialists change their professional activities during first two years after graduation. Complication of technical tasks to be performed by modern engineers requires concentration on a narrow problem; on the other hand, increase in ambiguity of the system of postindustrial society makes this orientation risky. A. Toffler (1980) developed the idea that people should be encouraged and trained to change everything, both in their professional life and personal life. He states that human civilization experiences the Third Wave of its civilization: the First Wave is the settled agricultural society, the Second Wave is Industrial Age based on mass production and mass consumption in all spheres of life, the Third Wave is the post-industrial society in which Information Age is formed (Toffler, 1980).

In the Information Age, knowledge is essential. In the past decade, mankind has generated as much information as it did in the previous 2,500 years, but the ability to manage this information has not significantly increased. Through the Internet, unlimited information is available within seconds. Furthermore, in pace of technological change information is changing greatly. That is why to gain knowledge from the information to use it appropriately is becoming the main task. And universities are at the heart of the knowledge economy but only if they become capable of dynamism and innovation (Leadbeater, 2000, p.243).

A. Subetto (2000) introduces the idea of the Fourth Wave, where the determining factor is intelligence, intelligence of an individual and total intelligence of the society. Intelligence-innovation revolution results in Intelligence-Information Age. In this situation new demands to human thinking are made. Formal logic and discourse thinking are not enough. It is becoming more and more important to think comprehensively, creatively, to suggest specific solutions, not general ideas. Accordingly, the need in new methods of practical activities is actualized.

In his 'levels of learning' G. Bateson (1972) makes a conclusion that simple learning I, or ‘proto-learning’, is the transfer of certain amount of knowledge, generalization from basic experiences; ‘deutero-learning’, or ‘learning to learn’ contextualizes proto-learning experiences, providing the results until the stability of the world, relative to which the thinking skills are obtained, is kept. Learning III contextualizes ‘deutero-learning’, students are capable to switch thinking patterns that leads to creativity, flexibility,

adaptability (Bateson, 1972). Here appears the problem: how to get intellectual flexibility and not to lose the integrity of perception of the world, the ability to think projectively, being not only a tactician, but also a strategist of his/her life? In our opinion, to solve this problem is possible if to change the strategy of education, engineering education in particular. In this case, the main tendencies must become humanization and intellectualization of education based on real human needs, taking into account psychological characteristics of students, training of the professional with intellectually significant qualities, one of which is intellectual mobility.

G. Egorova (2005) defines intellectual mobility as a component and criterion indicator of intellectual culture, the culture that in general can provide personality and professional competence of future engineers capable to improve the methods of thinking in the atmosphere of intellectual freedom and informational variety. The other components are considered to be as follows: high competitiveness of a future engineer, intellectual intuition, intellectual responsibility, intellectual activity, and intellectual competence (Egorova, 2005).

It is worth noting that among major requirements of modern companies (for example, 'FF') there is the requirement for engineers' level of intellectual mobility. It again confirms the fact that intellectual mobility as the ability to change quickly the types and forms of intelligence activity without reducing its efficiency and productivity is becoming extremely important in a knowledge-based economy.

T. Kotmakova (2005) points out the necessity to develop personality mobility as one of major professional characteristics of future specialists. When describing various dimensions of mobility, namely, social, professional, academic and cultural, the scientist states that personality mobility is the basis for the development of these mobilities, and their level directly depends on the level of personality mobility. Developed mobility allows choosing the direction of other mobility dimensions for active self-improvement.

However, it is known that personality is considered to be an open self-developed system characterized by specific structure, in which psychologists identify five substructures of a personality (biological, substructures of representation forms, of social experience, of personality direction as well as the substructure of capabilities) (Maksymenko, 2008). It means that personality mobility, as a quality, cannot be viewed as a single basic unit in the hierarchy of all dimensions of mobility. In our opinion, it is intellectual mobility that is the basis for the development of personality mobility, which shows itself in its other dimensions and, in fact, representations of different spheres of human activities: professional, social, cultural, methodological, technological, and others.

Our study of modern investigations on the problem of the development of intellectually significant qualities required in future professional activities (Egorova, 2005; Khorunzha, 2009) as well as intelligence research (Kholodnaya, 2002) let us define intellectual mobility as an integrated characteristic of a personality that combines intellectual capabilities and personality traits in a system which ensure the readiness of a specialist to find, process and effectively apply required information, to make decisions and act promptly in conventional and unconventional situations, and choose the best methods of solving both reproductive and creative tasks changing quickly the types and forms of intelligence activity without reducing its efficiency and productivity.

It is important to determine the main components of intellectual mobility to ensure further investigations on this issue. Let us briefly consider them. Intellectual capabilities are the characteristics of the human intelligence which determine the efficiency of intellectual activities in specific situations in terms of correctness and rapidity of information processing while solving any problem, variety and originality of ideas. We do not distinguish intellectual capabilities from creative ones as, in fact, the components of creative aptitudes do not differ from common thinking skills.

In accordance with M. Kholodnaya (2002), the component of intellectual capabilities includes convergent capabilities, divergent capabilities (creativity) and cognitive styles. Convergent capabilities characterize adaptive abilities of individual intelligence with regard to efficiency of individual intellectual behavior in limited conditions of activities. These capabilities comprise cognitive abilities (verbal and nonverbal), combinatory and procedural capabilities. Cognitive abilities represent mental functions, such as rate of perception, visual and spatial processing, working and long-term memory, concentration and attention distribution. Combinatory capabilities, or creativity, are determined by rapidity (the number of ideas per unit of time), originality, perceptibility, and figurative thinking. Cognitive styles, relating to ways and methods in which information is processed, are connected with productivity of intelligence.

As in the two-word term “intellectual mobility” the leading constituent is a “mobility”, which in psychological and educational investigations is considered as the ability of a personality to change stereotypes in different situations, revealing and developing specific personal qualities, the second component in the structure of intellectual mobility is personality traits of a future engineer. The analysis of government requirements and qualification characteristics, in particular, let us determine the following traits that characterize intellectual mobility: adaptivity, systems thinking ability, communicativeness, tolerance, persistence in achieving goals.

Discussion

Rapid changes in a knowledge-based society in the Information Age influence all spheres of human life: not only physical objects and technologies change, but also understanding of processes and concepts. The requirement to provide mobility in European Area in Higher Education at all possible levels can not be realized without the development of such an integrated characteristic of future professionals as intellectual mobility, which enables them to make complicated choices in changing social and professional circumstances. The identification of structural components of intellectual mobility makes it possible to organize the process of the development of this personality characteristic during university years effectively. The determination of pedagogical conditions under which this task can be fulfilled is the following step in our research.

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