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Psychological Basis of Technological Leadership: Tools and Environment of Development of Personal Qualities of Future it Entrepreneurs

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Abstract: One of the most important objectives of Russian system of higher education and science is achieving global technological leadership around 2030-2035. The existing educational practice, even in technical universities, however is poorly prepared to train leaders who could spearhead innovations in Russian companies and their consequent technological leadership. The researcher analyzes personality traits of adult IT leaders, technological entrepreneurs and top managers of IT companies and compares them with 1st and 2nd year technical students. The main experimental method is the 16-factor personality questionnaire of R. Kettell (16PF). The research showed significant differences in the following factors: A (responsiveness exclusion) where the average in the group of entrepreneurs is higher by 31%, C (emotional stability-instability), where the average in the group of entrepreneurs is higher by 33%, E (dominance-subordination) where the average in the group of entrepreneurs above 35% and especially F (prudence-carelessness) where the average in the group of entrepreneurs is higher by 79% and H (boldness-shyness) where the average in the group of entrepreneurs is higher by 65%. On the basis of the research results, the researcher presents practical recommendations how to improve educational process and psychological environments of educational institutions.

Key words: Personality development, leadership, proactivity, personality traits, educational environment

INTRODUCTION

The Russian system of higher education on the present stage of its development, persistently strives to close the gap between often antiquated curriculum and the practical reality of professional activity which even graduates of the most prestigious universities are often insufficiently prepared for. The main reason for this gap is the traditional conservatism of the educational system, low rate of progress and innovation in educational institutions that limits their opportunities in the dynamic information society. However, "technological modernization of the Russian economy" is designated as the desired result of the development of science and technology in the relevant state program of the Russian Federation.

One of the tools to achieve this goal is the National Technology Initiative (NTI) declared by the President of the Russian Federation in his Message to the Federal Assembly on December 4, 2014. The NTI is aimed at the emergence of Russian companies-global leaders in future markets in 2030-2035. At the moment the main result of the work under the NTI is the development of "road maps" for the creation, development and promotion of advanced technologies, products and services as well as on the improvement of the education system to ensure talent needs of growing companies. This further underlines the urgency of the implementing approaches in the higher education system that improve the efficiency of training specialists, capable of providing technological leadership of Russia in promising new markets.

Thus, we can see there is a fundamental contradiction between demand for new educational technologies aimed at ensuring technological leadership of Russia and lack of experience in the development and implementation of such technologies in the system of domestic higher education.

A key deficit is the absence of programs of the targeted training of the leaders who could become innovation drivers in Russian companies.

Analyzing reasons for the lag of our enterprises in the field of leadership development and implementation of leading management technologies, Eberhard von Loehneysen, Director for Eastern Europe at McKinsey, notes that "leadership development in its modern sense is largely contrary to hierarchical management system dominating in Russia. More and more companies all over the world reject it as the rigid hierarchical system is disincentive, negatively affects motivation, makes the company less flexible and competitive. But the Russian model of management has evolved over the centuries and is largely determined by the economic context, therefore,

it is hardly possible to change it fundamentally in a short time". Developing this idea we consider it is necessary to note that domestic governance traditions are deeply ingrained in applied higher education where there are no elements of leadership development in the preparation of future leaders and experts. However, some progressive Russian universities for example, the Kazan Federal University are ready to conduct relevant studies and further optimization of the educational process for more effective development of personality traits and leadership skills in their students.

MATERIALS AND METHODS

The goal of the research: The goal of the study presented in this study was to determine the possibilities of educational and psychological influence to increase the leadership potential of students of the Higher School of Information Technologies and Information Systems (ITIS) of the Kazan Federal University on the basis of a comparative study of personality characteristics of 1st year students and accomplished executives and entrepreneurs in the field of high technologies. Achieving this goal is possible through the following tasks:

- Analysis of theoretical and methodological base in the field of leadership psychology, selection and justification of the methodological basis of the study
- The choice of psychological diagnostics techniques, adequate to the purposes of the study
- The formation of two groups of subjects: students of the Higher school of Information Technologies and Information Systems (ITIS) of the Kazan Federal University and accomplished executives and entrepreneurs in the sphere of high technologies
- Conducting of psycho-diagnostic measures, statistical and qualitative processing of the results obtained, forming the conclusions of the study
- Development of recommendations on improvement of the educational process in the Higher School of Information Technology and Information Systems (ITIS) of the Kazan Federal University on the basis of the findings of the study

Methodological basis of the research: One of the challenges of determining basic methodological approaches to technology in diagnostics and leadership development is the wide diversity of existing approaches to understanding the phenomenon of leadership. So, only within psychology, R.L. Krichevsky highlights the following most well-known interpretations of leadership:

- Leadership as a center of group processes
- Leadership as a characteristic of the person or the resulting effects
- Leadership as the art to achieve subordination
- Leadership as a form of persuasion
- Leadership as a power relation
- Leadership as a role differentiation
- Leadership as a process of generating patterns
- Leadership as an action or behavior
- Leadership as a result of group interaction
- Leadership as the exercise of influence (Krichevsky, 2007)

From a practical point of view we believe, the most important is the differentiation between the concepts "leadership" and "management". We share a view that "management relates to managing within a given sphere of responsibility and within the framework of established procedures rather than creating something new. Leaders, by contrast, do form the context and objectives, create something new" (Eberhard, 2004). In the framework of the research presented the leadership is defined as the integral quality of personality, characterized by its ability to influence people and socio-psychological processes consciously and purposefully through the creation of values and activity in accordance with it (Morov, 2014).

Under this approach, we were able to identify the key qualities of a leader, the development of which is possible in the framework of the educational process in the higher school:

- Existence of a conscious system of values, sense of life and work
- Ability to articulate and translate ideas reflecting this meaning which sets the grounds for the leader's and his followers' activities
- Ability to have a motivational impact on people
- Ability to manage activities in the field of uncertainty (Morov, 2014)

Existential aspect of leadership: Of all the above qualities, "existence of a conscious system of values, sense of life and work" needs further attention and elaboration most of all as this system seems to be the most important element of the leadership, ensuring the individua's ability to act consciously to create something new to shape the context and objectives actively and purposefully.

The acquisition and transformation of system of values is obviously a result of the interaction between the developing person and the surrounding socio-psychological environment. Social environment, regardless of its scale, whether it is family microsocium or

human civilization in general is the source of motivation and sense of life as well as the space of their implementation and main force of resistance for the individual.

During any activity the person comes across other individuals and vital values of his personality confront other people's life values. In conditions of limited resources this confrontation inevitably leads to conflicts. Interpersonal conflict of the kind is a social norm and creates conditions for personal development. The society created special institutions and rituals to control the motivation of the individual, the process of determining his values and goals. Behavior beyond the established social standards was condemned and the guilty were deprived of access to social resources, lost status, wealth and even personal freedom. In fact for centuries individuals traded their personal freedom and ability to formulate and implement their vital values for security and access to public resources.

It is important to note that the personal assessment of the adequacy of such exchange always depends on personal assessment of the ability to solve security problems and achieve goals. Individual human abilities in the pre-industrial era were extremely limited but with progress in technology the individual productive capabilities began to grow. Now in the information age, a critical efficiency resource is the ability to work with information: consuming, analyzing, creating. A substantial part of necessary transactions can be completely performed by the individual, therefore his dependence on society resource is now as low as never before.

Leadership in information world: The growing desire of the individual for freedom, self-determination, formation and pursuit of his own values creates new relationship context between the individual and society. Independent personality with individual possibilities of survival and self-access to resources which seeks to realize its own goals, becomes a challenge to centuries-old foundations of society, accustomed to interact with people dependent on it. Previously, the society acted as the global moderator of human activity, imposing consolidated goals and defining the boundaries of the possible and permissible it offered security in exchange for the adoption of the rules of the social game. The existence of such patterns of interaction was possible only when the individual was limited in the establishment of new social and communicative relationships and exclusion from the local community meant the actual termination of social life-hat was a threat on the level of basic psychological needs.

Now thanks to the Internet, a person is able to establish dozens of new interpersonal contacts on a daily basis to be a member of hundreds of different communities with different goals, value systems and hierarchy. With such freedom of choice, a person is independent from each individual community and this applies to the macro-level communities: philosophical, ideological, religious. In the network anyone can find fellows with the same interests, views, beliefs, regardless of what these interests and beliefs are. For the individual the opportunities for social and communicative samples, experimentation with different social roles have increased manifold, the access to role models, role models has become better and faster.

The dependence of the individual on the society is no longer a consequence of the lack of material resources that changes the nature of these relationships but also changes the internal assessment of the adequacy of the exchange of individual freedom for social product by the personality. If earlier the public product was local identity and material things that a person was not able to produce alone now this product is the values that can be generated by a person who has gained a certain level of development on his own.

Changes in the nature of relationships and confrontation of the individual and the society thus do occur and are primarily directed at people who are able to perform their own existential search to determine their vital values in conditions of resource-found independence.

Of course this new social environment forms a new level of requirements to its members. If values are generated in the process of existential confrontation of the individual and the society then the leader is expected to have qualities of a fighter who is able to exist in a situation of existential conflict as well as proactively influence with his values on the environment. The modern image of success requires a high level of autonomy, independence, subjectivity, activity. It is confirmed by contemporary cognitive-psychological studies with data showing that the most frequent constructs associated with the concept of "eadership" re-ambitions, determination and impulsivity and what about temperament traits, activity and initiative are most often attributed to the leaders (Morov and Morova, 2015). This trend of perception of the leader as an active and decisive social converter is supported by popular culture that has established mythology around images of the most successful entrepreneurs, first of all in the field of innovation and high technology: Steve Jobs, Mark Zuckerberg, Elon Musk, etc.

The base and methods of the research: However, despite significant increase in attractiveness of technical specialties in higher educational institutions as well as active promoting technological entrepreneurship, the number of successful startups and their level of capitalization remain too low what does not allow to speak about positive dynamics in the achievement of global technological leadership. We assume that the higher education system does not encourage the development of those personality traits that contribute to the realization of the leadership potential of students to the increase of their entrepreneurial activity.

To test this hypothesis, we formed two groups of respondents. The first one was made up of students of the Higher School of Information Technology and Information Systems (ITIS) of the Kazan Federal University, the second one of the adult professionals, high level managers and entrepreneurs in the sphere of innovations and high technology, living and working in different regions of the country. The 16-factor personality questionnaire of R. Kettell (16PF), one of the most trusted and recognized multi-factor personality questionnaires used in modern psychological research was selected as the methodology to study personal characteristics of respondents. In our country works based on this questionnaire began at the faculty of psychology of the Leningrad State University in 1972 and are successfully in progress till nowadays. In order to optimize processing of results and to support inter-regional status of the experiment, onlinetestpad.com network resource where any examinee could pass the test at any convenient time was taken as the research area and mathematical processing of results was made automatically.

1st and 2nd year students of the Higher School of Information Technology and Information Systems (ITIS) of the Kazan Federal University were involved into the experiment. The invitation to take part in the experiment was sent to 367 students, 76 of them provided the test results at our disposal.

The second group consisted of businessmen and top managers of IT companies from Moscow, Kazan and Izhevsk. There were 18 people in the second group. The small size of the group primarily can be explained by the high requirements for the participants. For the experiment we chose only entrepreneurs with experience of launching new products and managers of major IT companies such as ABBYY Software, EPAM, etc.

RESULTS AND DISCUSSION

Following average factors of personality were identified in group 1 (students of ITIS KFU):

- 1 = 0.1, 0.4, 0.9, 0.3
- 2 = 0.8, 0.7, 0.3, 0.2
- 3 = 0.2, 0.6, 0.4, 0.9
- 4 = 0.7, 0.7, 0.5, 0.9

Following average factors of personality were identified in group 2 (managers and entrepreneurs):

- 1 = 0.7, 0.1, 0. 0, 0.9
- 2 = 0.4, 0.0, 0.0, 0.6
- 3 = 0.9, 0.6, 0.6, 0.4
- 4 = 0.7, 0.0, 0.9, 0.2

As can be seen from the above data, there are strong differences between the two groups. The most significant ones are in the following factors: A (responsiveness-exclusion) where the average in the group of entrepreneurs is higher by 31%, C (emotional stability-instability) where the average in the group of entrepreneurs is higher by 33%, E (dominance subordination) where the average in the group of entrepreneurs above 35% and especially F (prudence-carelessness) where the average in the group of entrepreneurs is higher by 79% and H (boldness shyness) where the average in the group of entrepreneurs is higher by 65%. In addition, one can see the difference between samples in factors G (consciousness irresponsibility) where the average in the group of entrepreneurs was lower by 30% and Q3 (undiscipline- controllability) where the average in the group of entrepreneurs was lower by 22%.

Thus, we can state that the existing IT-entrepreneurs in comparison with students of the Higher School of Information Technology and Information Systems (ITIS) of the Kazan Federal University demonstrate significantly higher levels of sociability, emotional stability, judgment, courage and desire to dominate, following their own impulses and being less constrained by external social requirements.

Of course, some of these differences can be explained by differences in age and social status of the respondents. Students are in highly regulated environment of the University where their position in the social hierarchy is obviously subordinate and any of their activities is subject to external assessment. However, it is during this period when the patterns of professional interaction that determine the formation of future professionals and their activities for many years to come are fixed. In the current educational environment of Russian universities there is a lack of factors that would contribute to the personal development of the leader, entrepreneur, innovator. That is why enterprises,

including IT companies have to spend considerable time and resources to compensate higher education deficits and to adapt the higher school graduates to the business realities and requirements for the participants of real business processes.

CONCLUSION

Summing up the study we can use the following metaphor: our government and universities determine achievement of technological leadership and the emergence of the new Steve Jobs as their objective but in practice prepare new Steve Wozniaks who are able to find technical solutions of the assigned tasks but are not capable of entrepreneurial and visionary thinking. Of course it is "Wozniaks" who should provide a larger share of workers in high-tech companies but without "Jobs" the efficiency of innovation activities and domestic firms' capabilities to create new markets and to determine the global technology agenda drops significantly. Achieving Russia's technological leadership is impossible without development of leaders who will drive changes and innovations at the level of individual companies and IT industry as a whole. Implementation of our recommended educational approaches and technologies will be the beginning of the improvement of the current educational practice in the field of high technologies and will provide preconditions for the achievement of global challenges in the system of higher education.

RECOMMENDATIONS

It seems necessary to form recommendations for the improvement of the educational process, implementation of which would ensure development of the personal factors important for the future professional career.

First of all it is necessary to pay special attention to the development of so-called soft skills, communicative abilities which will provide a future professional with more successful interaction with colleagues and business partners, participation in public commercial activities: business meetings, presentations, negotiations. In addition there are necessary appropriate training programs and activities aimed at the development of self-confidence, subjectivity, social courage-these qualities make the basis of entrepreneurial thinking. Thus, we believe it is important to develop a humanitarian component of education aimed at the development of verbal intelligence and communication effectiveness. In domestic and foreign science and practice there are well developed technologies of active teaching that are able to solve the problem: trainings, seminars, business games, etc. Fortunately there is successful experience of implementation of such educational innovations in practice of the Higher School of Information Technology and Information Systems (ITIS) of the Kazan Federal University.

Secondly, it is important to ensure that students of IT-specialties have experience in business processes in various roles: not only of software engineers and developers but also as project managers and if possible as startup-innovators. To implement this task, new approaches for delivering practical classes, increasing the number of business games, project works are required. We need to emphasize the potential of cooperation between universities and commercial enterprises as well as small innovative enterprises based on open universities-the immersion of students into practical work in various roles, solution of various problems, both technical and managerial and communicative is able to significantly increase the success of future professional activity of graduates.

Such educational innovations correspond to the developed in contemporary psychology approaches to personal growth and personal effectiveness that recommend paying special attention to the following aspects of personality:

- Expanding the scope of human interests
- Development of reflection skills
- Development of the sense of inner freedom.
- Voluntary responsibility (Makarycheva, 2014)

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REFERENCES

Eberhard, V.L., 2004. Leadership Development: The Russian Context. Vestnik McKinsey Publishers, Moscow, Russia, Pages: 220.

Krichevsky, R.L., 2007. Psychology of Leadership. Statut Publishers, Moscow, Russia, Pages: 541.

Makarycheva, I.N., 2014. Personality development and personal effectiveness reserves. Proceedings of the 12th International Scientific-Practical Conference on Modern Psychology: Theory And Practice, October 10, 2014, Samizdat, Moscow, Russia, pp: 142-147.

Morov, A. and N. Morova, 2015. Studying leadership in the context of existential personality psychology. Rev. Eur. Stud., 7: 1-7.

Morov, A.V., 2014. Socio-psychological training of leadership in training of clinical psychologists. Mod. Educ., 4: 50-52.