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OF SCIENTIFIC RESEARCH.
ANALYSIS, GOVERNANCE, PROSPECTS**

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based on the results of
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**ФИЗИКО-
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НАУКИ**



**PHYSICS AND
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DETERMINATION OF THE LEVEL OF ENVIRONMENTAL POLLUTION IN THE PROCESS OF MOBILE TELEPHONE COMMUNICATION

Annotation

The article presents the determination of the level of environmental pollution in the process of mobile telephone communication in the system of interaction of sources of electromagnetic fields with the surrounding social and natural environment.

Keywords

The level of environmental pollution, the process of mobile telephone communication, the surrounding social and natural environment.

The relevance of this topic is determined by the establishment of the level of environmental pollution in the process of mobile telephone communication.

The object of the study is the system of interaction of sources of electromagnetic fields with the surrounding social and natural environment.

The subject of the study is the study of the interaction of sources of electromagnetic fields with the surrounding social environment.

The research method is a holistic and systematic analysis of literary sources and measurement of the effect of mobile communications on the operator.

The hypothesis of the study. Mobile communication power up to four watts has a high ponderomotor effect starting from the auricle with an opening area of 1.14 cm².

In the State Report on the sanitary and epidemiological situation, electromagnetic fields are ranked fourth in the rating of physical factors affecting residents of settlements. The main sources of electromagnetic fields (EMF) of the radio frequency range are radio - technical objects of communication, radio - television broadcasting and radio navigation. The number of transmitting communication facilities is growing rapidly, which is primarily due to the development of mobile communication systems, including an increase in the number of transmitters (cellular base stations – BS), as well as the reconstruction of existing facilities in order to introduce communication systems of the third (3G) and fourth (4G) generations. Base Stations are usually understood as a complex of radio transmitting equipment (repeaters and transceivers) that communicate with cell phones. According to official data, the number of measurements of electromagnetic fields during

the survey of radio - technical communication facilities has increased significantly recently. In 2008, about 282 thousand such measurements were carried out in Russia, in 2012 – more than 720 thousand. This indicates the increasing hygienic importance of EMF as a factor that has an adverse effect on the population.

The significant negative impact of electromagnetic fields on a person is confirmed by official sources. It is considered to have proven effects on the formation of brain tumors with prolonged use of cell phones. Cellular communication is one of the uncontrolled sources of electromagnetic load on the population. In large cities, the total EMF power of subscriber terminals and BS exceeds the power of all other radio engineering facilities in the frequency range of 300 MHz - 3.5 GHz.

If we analyze the situation of establishing the level of environmental pollution in the process of mobile telephone communication in one of the districts of a large city, we can assess the environmental situation and possible risks to public health due to environmental pollution by electromagnetic fields of BS. In the territory of the standard district, BS occupy the leading place (84 %) among all transmitting radio engineering objects in terms of relative number. Up to 112 BS can be located on the territory of a standard area, each of which has from 1 to 6 transmitters (the total number of transmitters is 486). The BS consists of transmitters of various frequency ranges from 390 to 2416 MHz with a radiated power from 0.5 to 80 watts. On the territory of the district, BS are located mainly on the roofs of residential buildings.

Electromagnetic pollution of the territory of the district was estimated on the basis of data on the energy flux density (PPE) of the electromagnetic field (EMF). The calculation should be analyzed for three heights - 2, 15 and 30 m from the earth's surface, to take into account the synergistic interaction of environmental factors.

The holistic - system solution of this problem is associated with: the basic - generalized star of the Archgamma of the hyperspace of vital activity; the basic - generalized holistic - system cycle of vital activity; the basic - generalized star of the Archgamma of system analysis; the basic - generalized manifestation of the twelve stages and forms of the cognitive hyperspace of vital activity relative to the educational process; the basic expression of the twelve stages of holistic - system action [1, p. 12].

At the same time, it is important to reveal the entire structure of each space regarding the establishment of the level of environmental pollution in the process of mobile telephone communication. The consistent structure of the system analysis of the problem begins with the establishment of the level of environmental pollution in the process of mobile telephone communication as a system. Next, the conditions of the level of environmental pollution in the process of mobile telephone communication are presented. The integral properties of environmental pollution in the process of mobile telephone communication with respect to spatial, temporal, power and energy indicators are investigated. This allows us to study the system properties of the level of environmental pollution in the process of mobile telephone communication.

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ПЕДАГОГИЧЕСКИЕ НАУКИ



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SOCIOCULTURAL FACTORS AFFECTING RUSSIAN LANGUAGE LEARNING: A CASE STUDY OF CHINESE GENERATION Z STUDENTS MAJORING IN PHYSICAL EDUCATION

Annotation

The article investigates sociocultural factors that contributed to developing certain psychological characteristics in Chinese Generation Z (Gen Z) and have negative influence on Russian Foreign Language (RFL) learning by Gen Z Chinese students majoring in Physical Education (PE), resulting in lack of learning motivation and poor RFL learning performance. The study is a case study of 9 Gen Z students of Institute of Physical Education of Zhengzhou University who were taking one - year preparatory course (2020 - 2021 academic year) in RFL. There are three research objectives: 1st is to identify sociocultural factors that affect RFL learning motivation in Gen Z Chinese PE college students; 2nd to identify Chinese Gen Zers psychological characteristics; 3rd is investigate factors that form learning interest and learning motivation in Chinese ‘generation after 90s’ (90后). Major research methods are systematic classroom observation and semi - structural interview. Findings of the study can be grouped as follows: 1st group is major sociocultural factors (they are: weakening or disruption of ‘men outside the home, women inside’ pattern of traditional Chinese family life, weakening of kin ties, ‘hyper - parenting’ and inadequate consumption concept) ; 2nd is psychological characteristics of Chinese Gen Z ‘shaped’ by sociocultural factors (such as: sense of uniqueness and lack of self - criticism, mood swings and emotional instability, rebelliousness and social deviance, desire to be acknowledged and validated, boldness and desire to stand out) ; 3rd group is factors that form RFL learning interest, negative influence of sociocultural factors on them, causing decrease in and learning motivation in Gen Z Chinese PE students that intend to pursue Master and PhD degrees in Physical Education educational establishments in Russia. Findings revealed that sociocultural factors contributed to development of certain psychological characteristics of PE students impede their achievement of ‘self - actualization’.

Keywords

Gen Z, RFL learning, Physical Education, sociocultural factors, psychological characteristics, learning motivation

Introduction

Generation Z (Gen Z) is a generalized term for all people born between 1997 and 2012[17], it is a world - wide unique entity of which are regarded to be “part of a new generation”[11] both by Western (American and Russian) and Eastern (Chinese) scholars due to globalization, rapid development of information technology, cultural diversity and other factors catalyzing intercontinental and cross - cultural dialogue.

Despite the fact that ‘new generation’ worldwide has similar characteristics, there are significant differences in psychological characteristics between Western (American and Russian) and Eastern

(Chinese) Gen Z representatives caused by sociocultural factors. Thus, this study will point out sociocultural factors and psychological traits that vary Chinese Gen Z from its Western cohort.

Reason for comparing American, Russian and Chinese views on Gen Z in the study lies within three dimensions: 1st is the depth and number of conducted researches (American scholars introduced the notion “Generation Z” and have conducted a major number of researches on the topic; moreover, ‘forefathers’ of Gen Z archetype William Strauss and Neil Howe happen to be Americans); 2nd is research continuity (Russian scholars view is derived from Strauss–Howe generational theory and adapted according to Russian socio - political factors) and the study purpose (the study investigates Russian language learning by Chinese Gen Z college students majoring in Physical Education, therefore introduction of Russian way to perceive Russian Gen Z is intended to ‘complete the research picture’); 3rd sociocultural identity of the focus - group (respondents’ sociocultural identity is Chinese) and authenticity of researched materials (researched materials are written in Chinese).

Significance and Purpose of the study

Significance of the study is derived from its purposes: firstly, to bring out Eastern and Western views on ‘New Generation’; secondly, to discuss factors that differentiate Chinese Gen Zers from their Western cohort; thirdly, to point out prominent characteristics of Chinese Gen Zers in general; fourthly, to investigate common sociocultural and psychological characteristics of Chinese Gen Z students majoring in Physical Education and Sport and intending to pursue postgraduate studies in Russia in same or similar majors, as well as RFL learning performance and decline in learning motivation caused by certain sociocultural factors.

Literature review

There is a noticeable decline in academic performance (including lack of motivation in foreign language learning) in Chinese Generation Z (Z世代) college students which has been a hot topic of a number of recent researches conducted by Chinese scholars (e.g. see Ya - fei Bi & Can Liu (毕亚斐 & 刘灿), 2012; Yu - gong Wu & Shou - yan Huang (伍玉功 & 黄首燕), 2013; Zhi - Feng Guo (郭志峰), 2013; Run - liang Zheng (郑润良), 2019; etc.).

It has to be mentioned that not only Chinese Gen Zers have been investigated during the past several years but, in fact, Gen Z generation drew world - wide attention because of unprecedented socio - demographic, sociocultural, economic and political factors that ‘shaped’ “all the people of about the same age within a society...”[9]. It should be mentioned that, generation archetypes were first described by Neil Howe and William Strauss in the book “Generations” (1991), in which they identified a recurring generational cycle in American and global history. They believed that Gen Z (is categorized as the archetype of “The Artist”) was partly shaped by Neoliberalism, Culture Wars, Tech Bubble, 9 / 11 and seen as “conformist to experimental, caring, open - minded, sentimental, complicating and indecisive”[20]. Thus, this generation is seen by American scholars as success - oriented, well - educated, financial health - focused, self - centered, liable to sexual and cultural diversity, innovative and determined - to - win people. For instance, David Nielsen expressed a common view of Gen Z, it’s “digital natives”[12] or, as Tracy Francis and Fernanda Hoefel, partners in McKinsey Global management consulting company, call “true digital natives”[15], emphasizing Gen Z’s digital superiority. Pew Research stresses that the generation is “tech - addicted” and “anti - social”[27] to the point that once it would call it the “loneliest generation”[6], pointing out that Gen Zers are more likely to use social media for interaction rather than seek

personal contact. Representatives of a ‘new generation’ are also considered to be politically progressive and have a “competitive spirit”[6], they are also regarded as quick - learners who are “hyper - focused on being the best in their group and earning recognition for their accomplishments”[6].

The adaptation of the Generation Theory for Russia was carried out by a team led by psycholinguist Evgenia Shamis (Евгения Шамис), the coordinator of the Rugenerations project and psychologist Alexei Antipov (Алексей Антипов) in 2003 - 2004. The age of accessibility of information, gadgets, wi - fi, gamification and Russian economic crises of 1997–1998 and 2007–2008[2] are considered to be major social ‘shaping’ factors affecting nature of the generation. Therefore, Russian scholars use similar description terms as their foreign colleagues in order to describe Gen Z, f. ex. ‘Alfa’ (Альфа) (not to be confused with American understanding of Generation Alpha, which “refers to the group of individuals born between 2010 and 2025. This is the generation after Gen Z.”)[7], ‘Digital Native’ (Цифровой человек), ‘Homebody’ (Домоседы)[3]. They also recognize members of the generation as “quick to learn and process information, they can instantly switch from one activity to another, as well as act in a multitasking environment”[1].

To summarize Western views on Gen Zers, it should be said that in OC&C “A generation without borders: Embracing Generation Z” research (which is the widest geographical study of Gen Z consumers to date, collected 12 million data points from 15,500 respondents of 9 countries around the world) shows that Gen Z around the world is “more cautious and pragmatic” as “they are less likely to smoke, drink or take drugs, and teen pregnancy rates are in decline. Some studies suggest they are particularly cautious with money. Combined, these features of Gen Z mean they are often labelled ‘Generation Sensible’”[26].

Research of previous studies and materials presented in three languages (English, Russian and Chinese) suggested that influence of globalization greatly affected the process of unification of Gen Z worldwide, including Chinese Gen Z, that was born and have been living during the period of China’s economic growth, which, according to American specialist in Asian Trade and Finance, Wayne M. Morrison, is considered to be “a new growth model that relies less on fixed investment and exporting, and more on private consumption, services, and innovation”[25]. And ‘digital natives’ are well - known for their consumption ability (several business periodicals believed that they are “account for 40 % of global consumers by 2020” [13;23]and innovativeness. It has certainly contributed to Chinese Gen Z exposure of a wide range of social and financial opportunities, such as family financial stability, various cross - cultural exchange programs and opportunity to study abroad, etc.

Sociocultural factors, being “the larger scale forces within cultures and societies that affect the thoughts, feelings and behaviors”[28] can be categorized as: themselves in: 1st is weakening or even disruption of ‘men outside the home, women inside’ (男主外、女主内) pattern of traditional Chinese family life, that contributed to women liberation and shifted focus from male figures to semi - gender social equality; 2nd is weakening of kin ties. Those who were born 90s onward are called a ‘rootless generation’ (无根一代) [40]by Chinese society, because they show living distance and psychological distance (距离); being benefit - oriented (利益)(Chinese used to say that they “pay more attention to the bondage of interests rather than family affection”)[40]; having economic and psychological pressure(压力) that leads to distancing from family members; not

having same 'three view of life and values'(三观)[41] (which are outlook on life, values, world view(人生观,价值观,世界观)) with their family members. Due to globalization, "modernization, industrialization, marketization, and urbanization"[32] that affected family intergenerational relations, Chinese traditional values thus, behavioral and family life pattern are undergoing certain changes. A number of Chinese from 30 to 90 believe that such changes are negative, for example, "Nowadays, blood is thicker than water and full of warmth is just a family label that people put on themselves"[40] became a common opinion of Chinese netizens; 3rd is 'hyper - parenting'. Chinese Gen Zers are second generation of only child policy (独生子女政策) brought up by less traditional Gen Y (Y一代) (first generation of only child policy) Chinese parents who tend to be over - protective, controlling and are inclined to see their offspring as an 'future investment', yet lenient to child's lack of responsibility and lack of self - control. Parenting of such sort (also called 'hyper - parenting')[32] has a certain influence to weakening family ties and traditional values. On that basis, generation Z of the country can be called 'hyper - children', "a generation that has never known worry..."^[14] which results in inability to be self - driven and independent as "they're expected to be perfect"[14]; 4th is inadequate consumption concept. Chinese used to describe Gen Zers as those who "consume ahead of time, are keen on online shopping, and invest in financial management"[42]. They are called 'Moonlight clan'(月光族), it's a group of people whose monthly income is used up and spent before the beginning of the next month. At the same time, it is also used to describe not making much money, and the monthly income can only maintain one part of the basic monthly expenses[44]. Chinese Gen Zers who were interviewed on their consumption habits, admitted to spend money as soon as they receive it ("I received my salary one second, and the next second has been spent."[34,1]). Unlike predecessors they also support credit consumption and 'mortgage' consumption way (按揭的消费方式)[44]. Chinese researchers suggest that 'new generation' "although may earn less, they want to live a delicate life"[42], which was cultivated by 'hyper - parenting' and economic grows of China.

That has laid the ground for a common way Chinese males and females of 30 to 50 define Gen Zers. Chinese netizens conducted unified and generalized study of opinions Chinese society has on 'rising wave' (后浪)[51] that was posted on Baidu.com forum section (百度知道) in 2017. According to it, Chinese Gen Z is intelligent (their "average IQ surpasses the previous peers, strong curiosity and strong ability to accept new things"[39]); skillful; having strong sense of competition (竞争意识强烈) [39] having clear understanding of common Chinese social values and having more pragmatic ones ("比较了解中国社会的主流思想和价值观, 且价值观更加现实"[39]); having strong market consumption concept; often having weird hobbies and preferring Internet undertakings ("网络时代的广阔事业")[39].

Analysis of Western and Eastern general characteristics of Gen Z members suggests that, "social factors bring cultural convergence, that is, increasing similarity throughout the world"[8], not surprisingly (as Generation Z makes 30 % of the global population[26]), resulted in Chinese Gen Zers having similar characteristics to those of their Western cohort, e.g., being tech competent (or having "high digital literacy"[18]), 'shrewd consumers', culturally and socially aware, "strong sense of loneliness" [37;193] (孤独感强), intelligent and innovative. Thus, it can be concluded that, American, Russian and Chinese Gen Z have common intercontinental characteristics which were caused mostly by globalization and westernization of Asia.

However, unique sociocultural factors that Chinese society has faced (they are mentioned above) have clearly affected Chinese Gen Z psychological characteristics, which seem to be not consistent with those of Western Gen Zers. According to the views, also provided by the unified opinion mentioned earlier, Chinese ‘young generation’ (年轻代) has following psychological traits: being confident yet fragile, sensitive yet selfish (“自信又脆弱，敏感而自私”)[39]; being individual rather than communal; being self - centered; being considerably relaxed and relatively shallow - hearted (“内心有时较为空虚”)[39]. In comparison to the Western ‘New Generation’, it’s quite noticeable that some of those traits are polar to those introduced by Neil Howe and William Strauss or other Western scholars. For instance, being fragile (Western Gen Zers are toughened by multicultural diversity, immigration issues, etc.), being relaxed (recent American statistics study revealed that “70 % of teens across all genders, races and family - income levels say that anxiety and depression are significant problems among their peers”)[5] and being selfish (being opposed to having a “strong desire to stand out and feel unique”[27] as respondents of OC&C research say about themselves). It leads to the following conclusion: Chinese Gen Zers are more psychologically fragile, unstable, over - nurtured by family members, self - centered and selfish than the Western cohort.

Supposedly, such factors as fragile psychological state, global network influence, self - centeredness, weakening of kin ties, etc. became one of the reasons for Chinese to call them ‘New Generation’(新人类)[50,75] or ‘New Human Being’ (新新人类)[46;38] as their life style, social behavior, common and traditional values, mentality and psychological state drastically differs from one their predecessors had.

Undoubtedly, ‘New Human Being’ lifestyle influenced Gen Zers’ psychological factors, which refer to “the workings of the mind or psyche: motivation, learning and socialization, attitudes and beliefs”)[22], particularly their learning style and learning efficiency.

Age range of college students pursuing undergraduate degrees in China varies from early - 20s to mid - 20s which is crucial time for Generation Z members because those children who were used to overly protective and controlling parents (are called ‘glass heart generation’(玻璃心世代) by Chinese netizens because of their inability to accept any criticism, having dichotomous thinking, discounting positives, blaming and labeling others, etc.), over - nurtured Chinese Gen Zers, who are believed to lack control over their emotions, , experience great difficulty in adaptation to semi - independent living and learning environment on campus. As findings of Dao - quan Luo (罗道全), Chinese scholar of Beijing Institute of Petrochemical Technology, reveal, that 84 % of college students believed that their adjusted mood affects their learning efficiency greatly[43,245], yet they don’t take any measures to improve the situation.

As a result, the inability to quickly adapt to changing conditions (Chinese scholars believe lack of communication methods and poor self - care ability (缺乏交际方法，自理能力差)[37,193] contributed greatly to that) caused high levels of anxiety in the ‘rootless generation’. Recent research of representative of China Youth Research Centre, Xian - zhong Hu (胡献忠), demonstrates that 60.7 % of college students were “a little anxious” during the first month of enrollment and 10.6 % felt “very anxious”[38,66]. Such phenomenon is highly manifested in students who study Physical Education and majors related to it, considering, Chinese Education system to put focus on physical training rather than on theoretical and analytical academic activities, thus academic classes and academic performance during those classes can cause increase

in students' anxiety level. Consequently, 'glass heart generation' that used to physical but not mental training and intend to pursue postgraduate studies (usually they are research - based programs) in Russian universities have to face having Russian language classes 5 days a week.

Method, Data Setting and Procedures

The present study is a case study of 9 participants (88.9 % of them are males and 10.1 % is a female), who are Gen Z Chinese students majoring in Physical Education and preparing to pursue postgraduate studies in Physical Education Universities in Russia and are undergoing Russian language training.

As a basic Russian language training program the Physical Education College of Zhengzhou University offers students a one - year preparatory course of basic Russian language (divided into two courses: 1st is grammar and writing that are taught by a Chinese lecturer; 2nd is reading and spoken Russian that are taught by a Russian lecturer) and basic specialized course (purpose of which is to provide information on Physical Education major courses, terminology, requirements etc. taught by a lecturer of a targeted educational establishment in Russia). Students attended the Chinese lecturer's classes every morning four times a week from Tuesday to Friday and they lasted for 2 - 2.5 hours (1.5 academic periods) a day; Russian lecturer's classes were arranged every afternoon four times a week from Wednesday to Saturday, they lasted for 3 hours (2 academic periods) a day. Students also had a basic specialized course, duration of which was 3 hours, every Tuesday afternoon. Teaching materials used in blended - learning, can be grouped according to the teaching purpose, as A1 level materials for fall semester and A2 - B1 level materials for spring semester.

Data was collected through systematic classroom observation and semi - structural interview, prepared and implemented by Anastasia Vorontsova, Lecturer of Russian Language in Physical Education College of Zhengzhou University.

Data Analysis

Cross - case analysis, which is regarded to be the second level of analysis associated with a case study approach, has been used in present study. In it, cross - case analysis refers to analysis and findings that relate these particular cases to those found in other cases. In particular, it involved analysis of Chinese Gen Z learning motivation, aptitude, study attitude, study habits and self - concept by investigating of Final exam scores and regular classroom activity, interview results and comprehending contributing factors that influence the case. In other words, the basis for the case - study analysis is understanding and interpretation collected data.

Findings

Classroom observations, conducted during two academic semesters (fall and spring semester of 2020 - 2021 academic year), showed that Chinese Gen Z students, majoring in PE expressed significant interest in Russian learning during the first academic semester (fall semester: from October to January), for instance, around 88.9 % of students did homework and tasks in class regularly; 88.9 % percent of students were present in each class and showed interest in study materials. It was clear that students were motivated to succeed in RFL learning as they were success - driven, knowledge - oriented, used to rely on knowledge that they have acquired (and were acquiring) in RFL classes with a secondary assistance of mobile dictionaries and translators. Findings indicated that the reason for vigorous RFL learning was defined by the study purpose of the respondents, that was to learn the language basics to be able be integrated with the Russian language environment, as can be deduced from a generalized interview answer of the focus - group

members: "I opted to learn the basics as fast as I can so I will be able to carry out simple tasks or understand simple sentences in Russian". Furthermore, classroom observation demonstrated, that 88.9 % of students had relatively high level of RFL learning motivation.

However, when attending classes of both Chinese and Russian lecturers, during the second half of the year (spring semester: from March to June), students showed a significant decline in motivation for RFL learning, which was manifested in a decrease in attendance (each class 22.2 % to 33.3 % of students were absent), inability to complete assignments (44.4 % to 55.6 % of respondents copied answers from classmates, refused to carry out an assignment verbally, found excuses to 'buy time' and hope not to be asked by the lecture again. Excuses, used by the respondents, were as follows: "I'm not done yet, I need more time"; "My supervisor asked me to do a lot of research work yesterday so today I came just to listen to the class but not to study"; "I got vaccinated some time ago and I still feel funny. I need some rest"; "Let others speak first, I will see if I can come up with something" etc. Moreover, the focus - group manifested lack of interest in learning content (44.4 % of students spent most of time on phone and paying no attention to the class). It has to be mentioned that 66.7 % students purchased electronic pocket interpreters and 22.2 % of respondents downloaded multilingual translation and interpreting mobile software and were completely relying on digital translation and interpreting of both: lecturer's speech and paper materials, not making any effort to deliver a speech or carry out a task independently. Classroom observation revealed that there was only 10.1 % of Gen Z students (only female student). that didn't rely on any software or electronic devices (except mobile dictionary) while attending RFL classes.

Learning motivation is formed by six factors: attitude, study habits, attention, self - concept student aptitude and motivation[29,134]. As in RFL learning, all factors proof to be equally important, so, it would be pertinent to investigate all of them.

1. Attitude and study habits

These factors are interrelated, so can be examined combined. It's generally known that Chinese students, majoring in Physical Education show lack of interest towards academic subjects. This view is supported by a number of researches investigating large number of Gen Zers (study PE and Sport related majors) from freshman to senior year, in order to identify their lack of interest toward theoretical and specialized courses (also called 'technical courses' or 'technology courses'). For instance, Yan Gu (贾燕) a scholar, whose Master degree research targeted high school and college PE students, came to conclusion that, even before being enrolled to the university those students manifest lack of cultural quality(文化素质)[36,23], thus, they feel more academic pressure than students of other majors and show lack of learning motivation in courses aside of PE. Yan Gu 's research data shows that during attendance of theoretical courses, 21 % of respondents expressed decrease in learning interest, while 15 % of those admitted to have improper conduct during the classes and they feel their grades are low. As for specialized courses, findings revealed that 18 % of PE major students were not interested in them and 13 % of respondents misbehaved in class[36,18].

It follows that students' study habits were cultivated before being enrolled to the university and they fail to alter them due to their lack of responsibility, indifference to studies and independence during college years. It is believed that, due to particularity of PE major, students that study courses different from PE undergo a 'don't want to study - have low grades - don't want to study' circle[36,23] that defined their attitude toward non - related to PE courses, as well as defined

behavioral intentions of self - conscious and success - oriented 'glass heart' Gen Zers are affected by it.

2. Attention

The study results demonstrate that 88.9 % of students paid full attention in RFL during fall semester, however the percentage has declined from 88.9 % to 33.3 % in spring semester. Most likely, it's connected to the following factors: 1st is increase in academic pressure (55.6 % of students were focused on writing their theses and final exams); 2nd is shift of focus from knowledge acquisition to be able to get integrated to the Russian language environment (which was students' purpose in fall semester) to specialized knowledge (PE and Sport related knowledge) required for entrance examinations in Russian Universities (interview feedback suggests, that in spring semester students regarded grammar and speaking classes as secondary and less useful than specialized course, taught by the representative of a target university in Russia. Students were also in the process of cramming for entrance examinations, as well as practicing reading, writing and retelling topics, such as "My family and me", "My hometown", "My academics", "Why I decided to study in Russia", etc.); 3rd is shift of RFL learning purpose (55.6 % of focus - group admitted "I am not really concerned with my poor academic performance, I just have to pass Russian University of Physical Education entrance exams, that's all"); 4th is purchase of electronic pocket interpreters which were used not as assistance in class (as it was during fall semester), but 88.9 % of Chinese Gen Z students fully relied on device services in listening, writing, and doing all kinds of exercises appointed by the lecturer. Honestly, cell phone dependence of 'tech - addicted' 'young generation', which defines by student's learning attitude and study habits, has become a corner stone of Chinese Education. Zhejiang Sci - Tech University research on phone usage in class and its influence on learning efficiency reported that 33.98 % of college students spent 25 % - 50 % of total classroom time on mobile phones; 16.59 % of students spent 50 % to 75 % of class time on social media and 7.94 % of students spend more than 75 % of class time on mobile phones in class. Among those, only 39.68 % of students use mobile phones to inquire about relevant content in class[47,535]. Research finding suggest that, college students of all majors nationwide used to get bored and tired of academic courses, so they tend to entertain themselves using cell phones or other electronic devices during classes, not to mention inclined to change of activities and have constant physical activity PE students.

3. Self - concept

Strongly affected by the sociocultural factors mentioned above and being a core factor of intrinsic motivation, self - concept (which is "our self - description according to various categories, such as our external and internal qualities")[22] greatly influences learning motivation. Kai - ren Sun 's (孙开仁) interview - based study called "Personal independence of conduct of a 'New Human Being'" introduces Chinese Gen Z perception of itself as an entity through recorded responses of a large number of representatives of the generation. Analysis of interview script demonstrated that Chinese Gen Zers self - concept consists of five general characteristics: 1st is sense of uniqueness and lack of self - criticism ("we started chasing stars, entertainment, and online life very early, all of which have some drawbacks, but we never care when we are young... we never admit defeat, because we have a 'heart of youth'(青春的心)...[46,38]); 2nd rebelliousness and social deviance ("we like non - mainstream.... Now this society is really realistic, and there are profit - minded people everywhere (利欲熏心的人)... [46,39]; "in order to buy non - mainstream items, some students would rather skip meals and save time to buy them; some of them abandoned

their studies in pursuit of non - mainstream fashion, and they were afraid that others would say that they were too old - fashioned to keep up with the trend[46,39]); 3rd is boldness and desire to stand out (“we are a group of ‘spicy chicken wings’(香辣鸡翅), fragrant enough, spicy enough, absolutely delicious! We are a bunch of unruly crazy girls! We like to arrange our hair like a hedgehog, put our hands in our pants pockets, whistle, and disdain to talk to boys. Talking about the Internet, martial arts and the like. Don't forget! Wearing super eye - catching and super cool T - shirts and extra - large jeans underneath”) [46,38]; 4th is mood swings and emotional instability (“we have no experience and we are not calm enough in times of trouble” [46,38]; “sometimes we are headstrong, sometimes sensible; sometimes we laugh, sometimes weep; sometimes we are happy, sometimes we sigh...”) [46,38]; 5th is desire to be acknowledged and validated (“I am an extremely ordinary girl, with no beautiful face, and with no big brain, but I will not lack self - confidence for these. I don't have any good writing skills, but I always like to write some words, even though my level is only equivalent to that of primary school graduates...”) [46,38].

Obviously, such characteristics as sense of uniqueness and lack of self - criticism, mood swings and emotional instability, rebelliousness and social deviance impede educational process in general and cause decrease in RFL learning in particular, as students ‘turn a deaf ear’ to criticism and express positive reaction only to praise and encouragement, even if they realize that it's not deserved. Thus, to increase learning motivation and to avoid hurting students' sense of self - importance and self - worth, a generalized approach to teach Gen Zers in higher educational establishments, called “只能说服不能压服” (can only persuade but not force to do), was developed.

Classroom observation showed that expecting soft, lenient and understanding attitude from their educators, respondents' reaction to the Russian lecturer's criticism, mistake correction or study advice can fall into four main categories: 1st is responsibility shift (44.4 % mentioned “I just got nervous so made mistakes”); 2nd is purposeful neglect of facts (77.8 % objected “I failed in reading not because I'm lousy at it but because the teacher corrects my mistakes and word stress way too often. She disrupts me. If she didn't correct my mistakes, I would read well”; “Teacher's demands are too high for students majoring in Physical Education. She should lower her expectations while dealing with students of such majors”); 3rd is ‘saving face’ (44.4 % of them promised “next time I will much do better”); 4th is indifference toward educational process (33.3 % of respondents expressed no response (not manifesting any emotions verbally or non - verbally), didn't take any notes and kept making same mistakes).

4. Student aptitude

Aptitude is defined as “differential potential of a person to acquire the skills required to perform competently given adequate time and training”[31].

The study suggests that Chinese ‘new generation’ students do not tend to reveal their full potential in RFL learning since they are over - nurtured by over - protective parents being “center of the family”[37,193] to the extent that Chinese society gave them a metaphorical name “Bird's Nest Generation” (鸟巢一代)[33,93]. Family's ‘Little emperor’(小皇帝) or ‘Little princess’ (小公主) [37,193] who “lack of understanding of setbacks and weak ability to distinguish right from wrong” (缺乏对挫折的认识, 辨别是非能力弱) [37,193] were placed by society under circumstances that obstruct development of mechanisms that help them overcome difficulties and setbacks, strive for academic and social enrichment, cultivate sense of responsibility etc. Such students do not feel

the urge to make the utmost effort to achieve academic appraisal (it was also contributed by “只能说服不能压服” (can only persuade but not force to do) approach).

This may also be supported by the respondents fall and spring semester final examination scores (see table 1).

Table 1

Respondent	Sex	Fall semester final exam scores (max.100)	Spring semester final exam scores (max.100)
1. Student A	male	67	69
2. Student B	male	45	50
3. Student C	female	86	95
4. Student D	male	67	48
5. Student E	male	-	63
6. Student F	male	71	71
7. Student G	male	52	62
8. Student H	male	63	80
9. Student I	male	72	70

Source: developed by the author

Based Chinese higher educational establishment evaluation (excellent score is 100 – 90 (优 >90); good is 89 - 80(良 80~89); average is 79 - 70(中 70~79); pass (also called ‘poor’) is 69 - 60(及格 60~69)[35] and not pass(不及格) which is below 60), final exam score of focus - group in fall and spring semester are as follows: as for fall semester: there are 0 % of students who got excellent score; good and average account for 10.1 % ; 44.4 % of respondents’ performance is poor and 22.2. % of students didn’t pass the final examination; as for spring semester, there are 10.1 % of students whose performance was considered to be excellent; 10.1 % of students got ‘good’ scores; another 10.1 % were average; 22.2 % of respondents scores are poor and 22.2. % of Gen Zers didn’t pass the final examination.

It can be noticed that Student C’s (10.1 %) performance enhanced drastically (see table 1 and table 3). It’s a female student who (unlike other respondents) had intrinsic motivation. Regardless of being a Gen Zer, she was brought up in a rather traditional Chinese family and was expected to abide by “Four women virtues” (妇女四德)[45], such as morality(妇德); appearance (妇容)(a woman must be dignified, humble and polite, not frivolous); language (妇言)(referring to be open to communication, yet be aware of what not to say, how it should be said and always listen to an interlocutor) and family governance(妇功) (brings importance to husband and children, respect of the elderly, diligence and frugality). Consequently, in order to ‘keep the face’ female student was the only one who didn’t rely on digital translators, was taking notes in every class, made prominent progress in RFL learning, as a result, her overall evaluation made by Chinese and Russian lecturers was considered as ‘well done’.

Table 2

Respondent	Sex	Spring semester final exam scores (max.100)	Final exam sections		
			Reading part (max.100)	Speaking part (max.100)	Topic Retelling (max.100)
1. Student A	male	69	81	46	80
2. Student B	male	50	56	23	72
3. Student C	female	95	92	100	95
4. Student D	male	48	59	23	63
5. Student E	male	63	78	30	80
6. Student F	male	71	70	64	79
7. Student G	male	62	70	35	80
8. Student H	male	80	80	80	81
9. Student I	male	70	80	51	78

Source: developed by the author

Table 3

Respondent	Sex	Fall semester final exam scores (max.100)	Final exam sections		
			Reading part (max.100)	Speaking part (max.100)	Grammar (max.100)
1. Student A	male	67	93	68	29
2. Student B	male	45	64	60	29
3. Student C	female	86	79	83	93
4. Student D	male	67	43	73	57
5. Student E	male	71	71	70	57
6. Student F	male	52	57	30	57
7. Student G	male	63	71	60	64
8. Student H	male	72	71	77	50

Source: developed by the author

5. Motivation

Being a “process that initiates, guides, and maintains goal - oriented behaviors. It is what causes you to act, whether it is getting a glass of water to reduce thirst or reading a book to gain knowledge. Motivation involves the biological, emotional, social, and cognitive forces that activate behavior”[10], this factor has become a combination of all four factors described above.

Based on investigation of previous researches and studies presented in English, Russian and Chinese and present study results, it may be concluded that four sociocultural factors (weakening or disruption of ‘men outside the home, women inside’ pattern of traditional Chinese family life, weakening of kin ties , ‘hyper - parenting’ and inadequate consumption concept) negatively

affected motivation of Chinese Gen Zers, whose “ability to withstand setbacks is low, often manifested as rebellious, withdrawn, and indifferent” (承受挫折的能力较低, 常常表现为叛逆、孤僻和冷漠) [46,39] expressed a considerable decline in learning RFL motivation, resulted in poor final examination performance. The research data (see table 2) demonstrates that, the speaking part of the fall semester final examination (section of the course taught by the Russian lecturer) 10.1 % of respondents score was below 60, which is considered ‘fail in exam’, increased to 88.9 % in spring semester. The reasons for that are as follows: in the spring semester, students showed inability and reluctance to learn context that is complex in structure and meaning; to study and learn by heart a large volume of information; to cope up with A2 - B1 level exercises, since it requires a considerable amount of students’ time and effort.

Undoubtedly, a major reason for that is the negative influence of sociocultural factors as hyper-parenting and weakening of kin ties, which was also confirmed by researches conducted by Chinese scholars, for instance, investigating post - 90s college students behaviors, Chinese scholars Yu - gong Wu (伍玉功) and Shou Huang (黄首) conclude that, generally, being college students of the ‘second generation of officials’ and the ‘second generation of rich’ Gen Zers mostly have an indifferent attitude towards learning, which makes them learning behavior is more casual and more loose...”[49,73].

Implications and Conclusion

It has been found that Chinese Gen Zers are entirely the ‘product’ of modern society. Such sociocultural factors as weakening or disruption of ‘men outside the home, women inside’ pattern of traditional Chinese family life, weakening of family ties, ‘hyper - parenting’ and inadequate consumption concept ‘shaped’ the core of the generation and created ‘new human being’ out of it.

Having multiple names, such as, ‘new generation’, ‘new human being’, ‘young generation’, etc. and being regarded as “the future and hope” (是未来, 是希望) [46,39] of the nation, Chinese Gen Z feel unique and omnipotent, innovative and bold, different and original. However, their inability to ‘tell right from wrong’ distorted those characteristics to the point that 12 % of Chinese population (Generation Z account for 12 % of Chinese population) manifests lack of responsibility for their life and life of their family members, inadequate consumption and financial management and indifference to studies.

Being over - protected, excessively cared about and coddled by parents and relatives as well as being tolerated by educators and other members of society, Gen Zers cultivated emotional fragility and instability, lack of self - criticism, weak ability to overcome difficulties and to make efforts toward goal - achievement in all spheres of life except entrepreneurial one. Lacking self - cultivation and moral cultivation[32,89] yet striving for academic and social validation caused ‘dualism’ of young generation’s outlook on life, as they are ambitious and ‘aim high’, yet tend to turn to others for help when they encounter difficulties and find it difficult to surmount them, which bring significant pressure to the generation that used to “play cool and reliable” (玩得酷靠得住)[48].

Along with formalization and marketization of school education[32,89], sociocultural impact has been reflected in academic performance of Gen Zers in general and PE college students that intend to pursue Master and PhD degrees in Physical Education educational establishments in Russia in particular. Students’ RFL learning motivation in spring semester was decreasing along with increasing study load and learning content complexity. It has to be said that, ‘seeking an easy way’

to overcome a growing study obstacle, the focus - group turned to purchasing electronic interpreting and translation devices and shifted all load to them, instead of making utmost effort to learn a foreign language and make progress in it. Such phenomenon was caused by indifferent attitude to RFL learning, because students' purpose (to learn the basics) was achieved in fall semester and new - set purpose (pass entrance examinations and get enrolled in Russian PE University) could be carried out by electronic devices; poor study habits, that were cultivated long before college enrollment and were not modified due to soft attitude of teachers and university authorities in addition to strong tolerance policies on low academic performance and misbehavior of students who study PE and Sport majors during classes in Chinese higher institutions; lack of attention toward learning and focus on entertainment during academic courses; semi - realistic and exaggerated self - concept considering themselves as people "focused on innovation and uniqueness"[26] they tend to defy norms of traditional Chinese society; PE student aptitude, which contributes to poor academic performance in theoretical and specialized disciplines; last but not least, external motivation that pragmatic Gen Zers manifest through desire to attain a daunting task by paying least effort.

Opposed to this, a supporter of 'no pain no gain' life perception and a writer of bestselling book on joy, William C. Schultz, once said "joy comes from using your potential"[30,43], this, consequently leads to personal fulfilment and sense of achievement of those who use their potential both academically and personally. Abraham Maslow identified it as self - actualization'[24,27], which is formed by acceptance and realism (realistic and accurate perception of the world around), problem - centering (not only focusing on internal gain but also solving problems that help to improve external world), spontaneity (act and think within the accepted social norms and according to the expectations of others), autonomy and solitude (need for personal freedom and privacy), continued freshness of appreciation (developing new problem - solving strategies and creativity) and peak experiences (significance, fulfillment, and spirituality)[19], to be a "final stage in the linear growth of an individual"[16].

The study suggests that due to influence of sociocultural factors, resulted in developing certain psychological characteristics, Chinese Gen Zers manifest lack in a number of elements that form a self - actualized individual, including spontaneity and problem - centering (due to Chinese Gen Z's rebelliousness and social deviance), partial autonomy (because of hyper - parenting that led to emotional instability and lack of responsibility) and problem - centering (sense of uniqueness and lack of self - criticism obstruct focusing on external world more than Gen Zers own internal gain).

It's generally believed that self - actualization can be achieved with the help of learning a foreign language, since it has been found that learning a foreign language helps with self - realization and self - understanding, studying another language accelerates brain skills and problem - solving skills, and it also helps with confidence - building[16].

Consequently, seeing acknowledgment "generation full of vigor and courage" (富有朝气, 勇于担当的一代)[39] need to adjust and improve a number of core personal characteristics to cultivate thoughtfulness, open - mindedness, selflessness, sense of responsibility, emotional stability and psychological flexibility to achieve self - fulfillment, self - realization and then, as a final stage of growth, self - actualization. Learning and making progress in RFL can greatly contribute to achieving that pinnacle.

The case study findings can be used on two main levels: 1st is theoretical level (as a material for further case study researches; as a reference material on combined generalized view on Western

and Eastern Gen Z; as a reference material on Chinese PE students characteristics; as a reference material on Chinese sociocultural factors etc.); 2nd is practical level (as a reference material for researches conducted on RFL learning of Chinese PE students and for those who study Chinese college students' learning motivation yet unable to refer to authentic statistics or materials written in Chinese).

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**ФИЛОЛОГИЧЕСКИЕ
НАУКИ**



PHILOLOGICAL SCIENCES

THE INFLUENCE OF NATIONAL FACTORS ON THE CORPORATE CULTURE OF ENTERPRISES AND ITS REFLECTION IN THE LANGUAGE

Annotation

This article is devoted to the study of the influence of national factors on the corporate culture of enterprises in the aspect of intercultural communication. In this article the structure of corporate culture is examined, the role of national factors in the process of formation of corporate culture is determined. The article gives the results of the analysis of the image discourse of a Russian and a German companies, conducted on the basis of the theory of cultural dimensions by Geert Hofstede using the method of discourse analysis. The specificity of the influence of national culture on the corporate culture of companies is revealed.

Key words:

Corporate culture, national culture, intercultural communication, image discourse, dimensions of national cultures.

At present, the need for a high - quality labour management causes scientific and practical interest in the phenomenon of corporate culture. Corporate culture is understood as a system of values, beliefs, principles, traditions and norms of behavior acquired by an organisation in the course of its functioning and shared by the majority of its members [1, c. 5].

Many scientists point out the significant influence of corporate culture on the production performance of enterprises [4]. A. L. Slobodskoy and O. A. Kasyanenko believe that purposeful development of corporate culture allows a company to use its human resources in an effective way in order to implement its strategy, increase the level of manageability of the company, strengthen the team's cohesion and labor motivation [2]. Besides that, having a strong internal corporate culture is one of the main means of positioning and creating a positive image of a company at domestic and international market.

The major component of corporate culture, like any other culture, is the culture of communication, since it is through language that the assimilation of cultural norms, symbols, values, behaviors, as well as the transfer of knowledge and information occurs.

Taking into account that each language has a certain national and cultural specificity, it is of considerable interest to study the influence of national culture on the corporate culture of enterprises in the linguistic aspect. In addition, the **relevance** of this work is due to the expansion of international relations in various spheres of public life, in particular in the field of economics, which also means the interaction of corporate cultures of organisations representing different nationalities.

Thus, the **objective** of the article is to find out to what extent national factors affect corporate culture of enterprises in different countries and to identify the features of reflection of national specifics in the corporate language of enterprises.

Corporate culture is a complex social phenomenon that is influenced by a number of factors. G. Hofstede has established that values shared by its representatives form the basis of any culture [6, p.

9]. Consequently, the formation of corporate culture is also carried out in accordance with corporate values and norms.

The American scientist E. Schein identifies the following levels in the structure of corporate culture: *the level of artefacts*, which includes behavior, style of clothing, architecture, workplace, forms of greeting, etc., *the level of espoused values* (common beliefs, moral principles, philosophy, values) and the deepest *level of basic assumptions* [9, p. 18]. This level affects the other two and includes understanding of time and space, attitude to people, meaning of objects and phenomena, national mentality. This leads to the conclusion that national factors underlie and significantly influence the formation of corporate culture of enterprises. Various researches conducted in this area have also shown that national cultural characteristics largely affect the corporate culture system, and in particular, the style of communication in a company, the style of human resource management, the motivation of employees, the style of leadership and negotiations, etc. [10]

One of the first studies in the field of organisation management structure in relation to national characteristics of working communities is the theory of cultural dimensions by Geert Hofstede, on the basis of which it became possible to assess the degree of difference between national cultures according to four main parameters on a scale from 1 to 100, which were subsequently expanded. These parameters include *power distance, individualism, masculinity, uncertainty avoidance, long-term orientation and indulgence* [6].

Two of the largest representatives of the metallurgical industry in Russia and Europe were selected for the study: the Russian mining and metallurgical holding Metalloinvest and its trading partner – the German industrial concern ThyssenKrupp AG. Metallurgy is the most important and one of the most promising sectors in the world economy. In addition, international cooperation is actively expanding in the metallurgical industry. The main selection criterion was the existence of a strong corporate culture in a company and its openness to international partnership.

The main means of communication between an enterprise and its target audience is image discourse – a set of texts that are jointly transmitted through verbal, visual and audiovisual channels, reflecting the corporate culture of an organisation for the purpose of positioning and creating a positive image [5, p. 10]. Based on this, the following material for the analysis in this work was chosen: advertising and PR texts, periodic publications, press releases and texts on the official websites of enterprises in the Internet in the amount of 50 units.

As a result of the analysis of the image discourse, it has been established that the corporate values of the studied companies show the peculiarities of national culture.

The image discourse of the German company focuses on the individuality of each employee, as well as the equality of positions: *«It provides an orientation framework and applies equally to everyone – board members, managers, and each and every employee»*. This is due to the fact that according to the study of G. Hofstede, there is a high rate of individualism and a low rate of power distance in the national culture of Germany – Germans tend to behave as individuals, and not as members of a group [7].

The image discourse of the Russian company is less emotional due to the lack of expressive means. This may be due to the high level of power distance as well as the fact that many Russian companies have preserved a predominantly authoritarian management style. In the image discourse of a German company, expressiveness is achieved through such means as a metaphor: *«Values such as reliability, honesty, credibility, and integrity are not empty words to us, but permeate our corporate DNA»*.

The high level of masculinity in German culture is also reflected in the corporate language of ThyssenKrupp: «*Your career – you decide*», «*We rely on talented IT specialists like you*». Germans value the spirit of competition and success more than good personal relationships.

The long - term orientation of both cultures is evidenced by such phrases as «*Мы готовы к следующему старту*», «*Устойчивое развитие: лидерство в эпоху перемен*», which reveals the ability of representatives of these cultures to easily adapt to changed conditions and their perseverance in achieving results.

Thus, in the course of the study, it has been proved that national factors significantly affect the formation of the corporate culture of enterprises in different countries, being at the basic level in its structure. The national peculiarities of each culture are reflected in the image discourse of enterprises, which in turn contains the basic values, norms of behavior, rituals adopted in the organisational culture of these enterprises.

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ТЕХНИЧЕСКИЕ НАУКИ



TECHNICAL SCIENCE

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STATISTICAL ANALYSIS OF POLLUTION PARAMETERS CHEBOKSARY RESERVOIR

Annotation

The analysis of the selection of the optimal monitoring system for field oil pipelines of the fields is carried out. Various methods of monitoring the technical condition of field oil pipelines are investigated. Their advantages and disadvantages are revealed.

Keywords

Monitoring system, defect, field oil pipeline, monitoring, sensors.

In the oil and gas industry, a large number of methods for monitoring field oil pipelines are used. Many of them are outdated in the process of modernization of the industry and do not give an accurate assessment of the technical condition of pipelines. The purpose of the study is to identify the most effective monitoring system.

Timely forecasting of the remaining life of pipelines allows you to plan the terms of repairs, determine safe technological modes based on a diagnostic examination and an assessment of the danger of identified defects without opening underground sections of the pipeline.

The most effective modern methods of pipeline diagnostics are:

1) The method of electrical resistance. This method is based on a sensitive element - an ER - sensor. The principle of operation is to change the resistance of the electrical circuit on the sensor element of the probe. The sensor is located in an aggressive corrosive environment of the pipeline, due to this, the cross - sectional area decreases on the surface of the probe element, without changing the length. At the same time, the resistance changes and the conversion into metal loss occurs. During the diagnostic process, the received data is processed and an analysis is compiled. The resolution of the ER - sensors is 0.001 mm. With this method, you do not need to stop pumping the medium. The disadvantage is the impossibility of using the method without specialized data processing systems.

2) Ultrasonic method. This method is characterized by the registration of reflected pulses. The principle of operation is based on the placement of overhead ultrasonic sensors in vulnerable places of the pipeline, which create a reflected signal along the entire length of the pipeline and register the wall thickness in a microprocessor device with high accuracy - up to 0.0025 mm. There are several ways to get data: manual and automated. This method is easy to install and register data. But with manual reading, a partial loss of data volume is possible.

3) The method of comparing expenses. The simplest method of monitoring, which consists in comparing the costs at the beginning and end of the technological section, when certain norms are exceeded, an emergency alert is automatically triggered. Information is recorded from flow meters installed at the entrance and exit of each section of the pipeline, the collected data is sent to an

electronic computer in the central control room. The method has a significant drawback, which consists in false positives of the system, which are caused by a violation of the stationary mode.

4) Non - contact magnetometric method. It is the most accurate method, with an accuracy of up to 93 % . It is based on the effect of magnetoelasticity – a change in the electrical resistance under the action of a minute field. The hardware and software complex registers anomalies of the magnetic field of the pipeline, which cause various defects [2]. Diagnosis is possible without direct access to the pipe metal and from the ground surface at a distance of 10 - 15 m. The obtained data is visualized in magnetograms, which are linked to coordinates and an electronic map. The method is productive, does not require stopping the product transport and is possible in areas inaccessible to the in - line method. But due to the influence of extraneous interference, a measurement error occurs, so it is used only on pipelines remote from cities. It is also necessary to have a pressure of at least 1 Mpa in the pipeline [2].

5) Acoustic emission method (AE). A promising monitoring method, which consists in installing AE converters along the length of the pipeline, which load the pipe and register AE signals and, according to these parameters, judge the presence of AE sources that are formed in places of various kinds of defects. Depending on the defect, there are different types of AE. The advantages include fixing unacceptable defects, as well as defects that did not have time to reach a critical state. The disadvantages are: the complexity of the design, a large amount of preparatory work, high cost and a relatively small control area (no more than 1000 m).

Analyzing the above methods, the most effective monitoring of the state of the field pipeline is the use of a combined method, which includes the combined use of such methods as: the stationary method of ultrasonic monitoring and the periodic use of the cost comparison method. The application of each method is unique, but when used together, each of the methods complements the shortcomings of the other.

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ЭКОНОМИЧЕСКИЕ НАУКИ



ECONOMIC SCIENCES

RELEVANT TENDENCIES AND FACTORS OF ECONOMIC INNOVATIVE DEVELOPMENT IN TERMS OF SCIENTIFIC AND TECHNICAL PROGRESS

Abstract

The article considers the main trends in the innovation development of the economy, analyzes its resources and institutional factors. The role of state regulation and stimulation of innovation activity is mentioned.

Key words:

innovative economy, institutional environment, technology, NIS.

Modern economic development is characterized by the transition to a new technological structure. The issues of developing the theoretical aspects of the innovative development of social structure are of particular relevance. Innovative development is understood as the progress ensured by the introduction of innovations, and the innovation activity necessary for development is “all scientific, technological, financial, trade and commercial steps that directly lead or should lead to the introduction of innovations” [6, p. 118].

The most important trends in economic development in the light of accelerated scientific and technological progress include: replacement of the sphere of production with the sphere of services; “transition of industrial production from mass to flexible, specialized ... the increasing role of innovation in all spheres of public life, not only in the economy; the acceleration of the volume of information in all communications; ... a significant increase in the role of knowledge” [2, p. 12]. Special role belongs to knowledge, which acts as a necessary condition for economic growth in all spheres of social life, and therefore is often regarded as the main competitive advantage of the state, its “intellectual potential”. The formation of a balanced and sustainably developing research and development sector with an optimal institutional structure will ensure an expanded reproduction of knowledge, increase the efficiency and effectiveness of the infrastructure that causes the commercialization of research results.

Constant development of innovative technologies requires a powerful scientific and technological base and developed socio - technical systems. Accordingly, the presence of “highly qualified personnel with creative (that is, associated not only with reverse engineering or progressive improvements) competences, systems of advanced scientific and technological organizations and innovatively active enterprises, powerful technological infrastructure” play a huge role [3, p. 51]. In addition, the so - called “early” and “qualified” users, financial markets and effective governmental support are needed.

At the moment, there is no doubt that not only technological, but also institutional innovations are of essential importance. And “for a qualitative improvement of the situation, a country should be able to combine the introduction of advanced technologies and the institutions corresponding to these technologies” [4, p. 9]. The process of institutionalization that occurs at the same time is “seen as a transition from informal relations and unorganized activity to the creation of organizational

structures, the activities of which are regulated by the authorities and regulated by the system of regulatory legal acts” [5, p. 574]. In this case, it can be said that institutions include not only legislation, but organizations, their activities and strategies. At the state level, “innovative development is designed to provide the national innovation system (NIS), which is a network of institutions in the public and private sectors, activities and interaction of which initiate, introduce, modify and disseminate new technologies” [6, p. 118].

There is a close relationship between the processes that determine the emergence of a new type of economy and the institutions that regulate them, the conditions of the institutional environment. Moreover, these institutions, being the most important component of innovative development, are the subject of close attention of the scientific community. The essential importance in this regard is such controversial issues as: “the origin and interrelations of institutions at various levels, the nature and degree of interaction of the economy and the institutional environment” [5, p. 573]. It is possible to get an answer to these and a number of other questions if, as noted by E.V. Borisova, to conduct an appropriate scientific analysis based on “interdependence, interrelation and inconsistency of innovation and institutional processes occurring in the economy” [2, p. 13].

Understanding the essence of the innovation environment is traditionally correlated with: “a set of rules of conduct for market entities; a set of related institutions; forms of influence and interaction of institutions; formalized and non - formalized frameworks and restrictions” [5, p. 581]. In the sphere of innovations, “it is advisable to consider it through the prism of investment attractiveness, that is, from the standpoint of creating favorable conditions for attracting investments in innovative projects and programs. This is one of the primary tasks of the economic policy of the state” [5, p. 581].

The national innovation system “cannot be built and is not able to function automatically without purposeful state regulation” [6, p. 118]. “The sphere of relations of the innovation system should include relations connected with the planning of innovations, the development of an institutional innovation mechanism for introducing and using innovations, as well as monitoring, audit and control at all stages of the innovation cycle” [2, p. 13].

The process of qualitative transformation of national innovation systems (NIS) can be enhanced by the emergence of a number of promising technologies, including such as “new communication tools that facilitate interaction and cooperation (from trading platforms and crowdsourcing / crowdfunding resources to cooperation on platforms and organization of global teams); internet education and other solutions can significantly expand the channels and reduce the costs of formation and transfer of institutions and culture, improve the quality of human capital without comparable costs” [3, p. 55].

The considered features of the innovation development of the economy allow us to say that at the present time resource factors, among which, in particular, are qualified personnel and financial capital, are of great importance. However, the focus is on the level of development of market institutions and NIS, therefore, innovation institutions are an essential condition and indicator not only of the socio - economic development and potential of the country, but also the development of society and the economy as a whole.

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INCOME AND EXPENDITURE IN FAMILIES. HOUSEHOLD EXPENDITURES AS A RATE OF ECONOMIC STATE OF THE COUNTRY IN GENERAL

Annotation

In this article family expenses and the incomes are considered. Influence of the family budget on national economy is studied.

Keywords

Family income, family expenses, Engel's law.

Before talking about the ways family expenditure can tell you about a country's economic condition, you should understand where families get their incomes from.

Households, as other macroeconomic agents, receive their incomes by owning factors of production. The income is qualified in according to the factor of production. Employees get salary for their labor, benefits for entrepreneurial skills, rent for their land and an interest for the capital.

The most common source of family income in most countries of the world is salary. At the same time, in the developed countries with a market economy the principal part of the income is received from providing other factors of production in somebody's use.

Unfortunately, such thing is not common in Russia. A command economy, which existed in our country in the 20th century, did not provide citizens an opportunity to receive something as income except for salary. The whole land and the capital were in the government's property and any display of entrepreneurial skills could be punished by the article of the Criminal Code.

However, times have been changing, and a command economy has gone into the past, having left an extensive field for studying. The government, in which people could only use one factor of production, is displayed in the structure of income of the soviet families. The structure of the income in 1982 is shown on the picture 1 below.



Picture 1

If you compare expenditures in the major Powers for 1982, the table will be as following.

Table 1

Country	Food	Clothes	Accommodation	Transport	Education and medicine
USA	10,0	6,5	25,5	13,5	17,5
Japan	15,0	6,0	24,0	10,0	15,0
Sweden	16,5	7,0	30,5	19,0	3,0
Greece	33,0	9,5	20,5	13,0	4,5
Portugal	35,0	11,0	15,0	16,0	6,0
USSR	40,0	20,0	8,0	8,0	3,0

As you can notice, the leading expenditures of citizens of the USSR are the expenditures for food.

The valuating of household's total expenditures occupies the important part of studying the regularities of development of the economy. The German economist Ernst Engel made a great contribution in the study of the structure of family expenditures. He identified the dependence that was named after the discoverer. "Engel's law" is stating "as income rises, the proportion of income spent on food falls, even if absolute expenditure on food rises; on clothes, accommodation, heating and lighting remains constant; the proportion spent on other goods (such as luxury goods) increases".

The explanation of this law is the fact that demands have various utility for people. And this is the reason why differentiation of incomes happens depending on gauge. The demand for food has the highest satisfaction rate. That is why if income of citizens increases, the proportion of income spent on food falls the fastest.

Engel claimed that as consuming capacity of households is formed due to the same models so structural analysis of expenditures may allow us to compare the level of wealth of population in different countries. Looking at the table 1, you may notice that the proportion of income spent on food in the USSR is bigger than in other developed countries. So, following Engel's law, we can come to the conclusion that the distribution of wealth in the USSR was lower than in other stated countries.

The situation has improved in modern Russia. You can see information from the Russian Federal State Statistics Service in the table below.

Table 2

Country	Food	Clothes	Accommodation	Transport	Education and medicine
Russia	32,0	8,0	10,8	2,2	3,0

But, of course, we should take into account, that the analysis of family budget will be incorrect without considering inflation. The basis of the problem is that with the fall of purchasing power of money family income goes down in value. People try to save themselves investing in foreign currency. It leads on negative effects for the country because money, which could be invested, become extracted from the national economy.

For example, many Russian enterprises are in the state of decline right now. Such organizations cannot provide competitive commodities and their devastation is inevitable. It will lead to the decrease in export and to the increase in import, which will be an advantage for foreign competitors. Investments make it possible to prevent the development of these tragic events and household savings are the main source of investments.

Therefore, we can conclude that careful tracking of household budgets and prevention of every dangerous process will be prudent for the government. The wealth of the country in general depends on the wealth of every single citizen. And there is a mini - recipe: people must get as much income as they need to provide more qualitative demand on the markets and invest savings in development of the state's economy getting benefits from it.

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