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School Education Harmonization Based on Natural and Cultural Conformity in the Russian North and the Arctic Region

Armonización de la educación escolar basada en la conformidad natural y cultural del norte de Rusia y la región ártica

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Contents

ABSTRACT:

The article is aimed at theoretical and practical substantiation of a conceptual vision of the need for and the possibility of a variational solution for organizational and pedagogical, regulatory, research and methodological, national and cultural problems of the regional educational system development in the Republic of Sakha (Yakutia) on the basis of principles of natural and culture conformity, taking into account the sociocultural conditions of the North and the Arctic. The experimental work has been carried out for 5 years in some local schools based on observation, forecasting, experimental analysis, systematization, generalization of factual information. The article analyzes the state of education in the Republic and scientific research of domestic and foreign scholars on the problem under study. The experiment has proved significant results in improving the quality of education, however, a very alarming situation in schoolchildren's health status has been revealed. It is necessary to take managerial decisions that would consider principles of natural and cultural

RESUMEN:

El artículo está dirigido a la fundamentación teórica y práctica de una visión conceptual de la necesidad y la posibilidad de una solución variacional para los problemas organizativos y pedagógicos, regulatorios, de investigación y metodológicos, nacionales y culturales del desarrollo del sistema educativo regional en la República de Sakha. (Yakutia) sobre la base de los principios de conformidad natural y cultural, teniendo en cuenta las condiciones socioculturales del Norte y el Ártico. El trabajo experimental se llevó a cabo durante 5 años en algunas escuelas locales en base a la observación, el pronóstico, el análisis experimental, la sistematización, la generalización de la información objetiva. El artículo analiza el estado de la educación en la República y la investigación científica de académicos nacionales y extranjeros sobre el problema en estudio. El experimento ha demostrado resultados significativos en la mejora de la calidad de la educación, sin embargo, se ha revelado una situación muy alarmante en el estado de salud de los

conformity in the specific conditions of the North and the Arctic enabling to preserve the original traditional economic set-up and nomadic life of indigenous peoples of the North, to develop native languages and regenerate the unique culture of northern peoples. It is essential to adopt regulatory acts in education that would consider the specifics of the Russian Nordic and Arctic territories. Keywords:
Keywords: nature-aligned education and training, school structure, natural and climatic characteristics, underfilled school, the world around, innovative educational processes.

escolares. Es necesario tomar decisiones administrativas que consideren principios de conformidad natural y cultural en las condiciones específicas del Norte y el Ártico que permitan preservar la configuración económica tradicional original y la vida nómada de los pueblos indígenas del Norte, para desarrollar idiomas nativos. y regenerar la cultura única de los pueblos del norte. Es esencial adoptar actos reglamentarios en la educación que tengan en cuenta los aspectos específicos de los territorios nórdicos y árticos rusos. Palabras clave:
Palabras clave: educación y capacitación alineadas con la naturaleza, estructura escolar, características climáticas y naturales, escuela insuficiente, entorno global, procesos educativos innovadores.

1. Introduction

The relevance of the article is determined by the proposed system of work on harmonization of school education taking into account the climatic conditions of the North on the basis of experimental studies conducted for several years in the Republic of Sakha (Yakutia). At the present stage of social development, in the context of modernization in all spheres of life, it is necessary to change approaches to education and training of the younger generation. The peculiarity of modern society is that at present, a creative personality is in demand that is able for life-long learning, active participation in improvement of the reality, understanding its problems, and meeting challenges of rapidly changing times. According to the authors, training should be provided not only under a different schedule, but also taking into account the social and cultural traditions of students. As the experimental results show, such training contributes to harmonious development of students and a gain in their health, as well as to an increase in their creative activity. Only educated, spiritually and physically developed imaginative people will be able to produce ‘unique knowledge’ and socially adapt their community to upcoming transformations in the northern territories of the country, in this particular case. Based on the study of the state of educational establishments in the Republic, it can be noted that migration processes have intensified in them, as well as throughout the entire Republic and the country; there is a decrease in the number of schoolchildren due to a low birth rate in the nineties. In recent years, many students have begun to enter specialized secondary educational establishments after leaving secondary school because of uncertainty about successfully passing common national examinations.

As a result, many secondary schools, especially in rural areas, have become underfilled. Underfilled schools are a specific feature of the northern territories where population dispersal is observed. In the North, educational institutions are located at the distance of 300–400 kilometers; therefore, educational process should be organized with this specificity taken into account.

The hypothesis of the article is that if to take into account the climatic conditions, the cultural needs of students, their unique traditions under the conditions of the North and the Arctic when building an individual trajectory of training and education, it is possible to raise a well-rounded competitive personality that would be actively involved in transformation of the northern territories. At present, the North and the Arctic are becoming a territory of development and great opportunities where human capital is the key player. It follows that the future of the Arctic and the North depends on what kind of people and what specialists will be educated and trained.

The authors’ conceptual vision follows from fundamental provisions of Grigoryev (2009), Kaznacheev (2012), Vasilenko et al. (2010) and Subetto (2009) about the natural and cultural conformity of children’s education, life and labor education, formation of a free creative personality. One cannot but agree with the opinion of Kaznacheev (2012) that “the experience of man and his relationship with nature is the first noospheric survival level”.

Morin in his study ‘Seven Complex Lessons in Education of the Future’ (1999) examines various approaches to the education of tomorrow. In his opinion, it is possible to resist the uncertainties occurring these days through harmony, environmental knowledge, tolerance,

culture, and ethics.

'New Visions Schools and New Century High Schools. 10 Principles of Effective Schools' (2005) emphasize that individual approach must be implemented in teaching.

Munroe, Borden, Orr, Etoney, & Meader (2013) note that there should be harmony between the aboriginal knowledge and education of the 21st century. The authors give three different examples of decolonizing approaches. According to the researchers, curricula should take into account the traditions and customs of aboriginal peoples. At the same time, their children should not lag behind civilization, and the knowledge and skills they have acquired at school should be applied practically.

Walters (2015) states that for hundreds of years teachers have recognized the importance of school climate. Early educational reformers Dewey (1916) and Durkheim (1961) admit that the school lifestyle pattern and atmosphere affect its students' lives and quality of education.

In the Republic of Sakha (Yakutia), studies of the following education scholars Afanasyev (1966), Danilov (2015), Neustroyev (2009), Gabysheva (2015), Vinokurova (2015), etc. deal with the problems of national school, the regional education system development, the specificity of school activities in the North, folk pedagogy, and ethno-pedagogization of teaching and educational process in rural educational establishments. It should be noted that under the conditions of modern innovative development, there is an intensive search for new ideas, methodological approaches, systems, technologies that would ensure a high level of effectiveness in training and education of the younger generation.

2. Materials and methods

In this article, the following methods are used to attain the target goal: observation, forecasting, experimental analysis, systematization, generalization of factual information. The experimental work has been carried out for 5 years in elementary school at Ytyk-Kyuyolskaya comprehensive school No. 1 in Tattinsky ulus, Tamalakanskaya comprehensive school in Verkhnevilyuisky ulus, and Malzhegarskaya comprehensive school in the Nyurbinsky ulus. The experiment was conducted under the supervision of Doctor of Education, Professor Neustroyev, the co-author of the article. In order to raise the awareness of best practices, teachers of these experimental schools went on a trip to Finland where operation pattern of general education schools corresponds to the natural northern rhythm. The teachers got acquainted with universal educational establishments and curricula of the Finnish who introduced the nature-aligned work pattern in 1980, visited the pedagogical faculty at university where general school teachers are trained.

Prior to the experiment, the ulus educational departments, leaders, parents and statutory representatives of students of the above-mentioned educational establishments had agreed to participate in the study. Practical implementation of the ideas was permitted and supported by the local authorities. The schools developed their own experimental curricula, the ideas were substantiated, the main provisions, passport information of schools, an elective syllabi in all the subjects in primary school, a training agenda for semester with the academic year beginning on August 1 were enshrined. Consequently, a holiday schedule was determined for students to have winter vacation in January. In July, organizational and preparatory activities were held. The article also uses data from monitoring studies in terms of the educational system conducted by the authors in different years in the Republic of Sakha (Yakutia).

3. Results

This paper substantiates the authors' conceptual vision of the need for and the possibility of a variational solution for organizational and pedagogical problems of the national and regional educational system development in the Republic of Sakha (Yakutia) on the basis of natural and cultural conformity principles taking into account the sociocultural characteristics of the North and the Arctic.

The authors have carried out a five-year experimental work in rural comprehensive schools in the Republic on educational process organization on the basis of natural and cultural

conformity and ethno-pedagogical approach. The results obtained testify to positive changes in education and training. Consequently, in order to improve the quality and efficiency of education in the Nordic and Arctic territories of the Russian Federation, it is necessary to have variational regulatory acts on organizational forms, on seasonable study time allocation throughout the year, on an increased ratio of the national regional component in curricula, on living expenses per student, on equipment and material procurement, etc. taking into account the socioeconomic and sociocultural development features of the Republic, the national educational regional system in the North and the Arctic.

Out of 649 schools in Yakutia, 72 % are located in rural areas, and 63 % of them are underfilled, which greatly exacerbates the position of teachers: staff turnover, academic underload in the specialty, lack of improvements, etc. For rural areas, poor heating of separate houses, a lack of transportation means for minors carriage in winter, a shortage of doctors, and other challenges result in health problems not only in teachers, but also in children. What can a teacher feel like in such a school? After all, they are a linchpin in the work of any school. J. Evans also emphasizes that a teacher's poor material standing in comparison with other professional classes hinders their inspiration and unconstrained work (Munroe et al., 2013).

Unfortunately, there has not been any analytics yet to examine such issues as how much people's efforts, energy, and financial resources have to be spent on heating, lighting and maintenance of educational institutions for almost nine months. The authors believe that the unified organizational educational system established in the immense territory of the Russian Federation, without taking into account specifics and sociocultural characteristics, has significant negative implications in terms of the children's health and quality of their education and training in the northern and Arctic areas of the country.

This is what member of the Russian Academy of Medical Sciences, holder of the international Hildes Circumpolar Health Award Kaznacheev (2012) wrote about health: "... the concept of health is an evolutionary genetic, emotional, ideological, cultural (moral) behavior of generations, families – with upbringing and education of children and adolescents".

Scientific research has shown that at northern latitudes, natural climatic and geographical characteristics complicate life and daily routine of people, straining the body systems, which leads to functional impairment. Physiologists have recognized that "practically the whole human life is a combination of a constant change of dominant functional systems reflecting the essence of continuous metabolism and constant adaptation of man to the environment, especially to social one" (Sudakov, 1999).

Inhis review article 'Polar Syndrome of Noospheric Evolution' Kaznacheev (2012) points to studies that have identified serious failures in human body: "A probable basis for changes in the quality and quantity of health in the descendants of alien population in the Far North (second and third generations), according to a comprehensive research, can be disorders of physiological growth and reproductive cells and tissues development mechanisms in parents of children born in the North. An important reason for this mechanism breakdown in the formation of a 'polar stress syndrome' is a disorder of the polar type of cellular metabolism in the so-called 'northern cells' and also because of a change in their evolutionary development vector under the influence of a special imprint form described for this territory. Academic performance of children in the North has been of particular concern for scientists. Practical reflections of scientific research on polar stress syndromes have been identified subsequent to the results of All-Russian Medical Examination. These issues were clarified by the First President of the Republic at a teacher meeting: "95.7 % of children in the Republic have been covered by medical examination. It has turned out that 56.1 % of the children have abnormalities in health status. In the Olenyoksky ulus, 95.4 % of children have health disorders, in Allaikhovsky ulus – 88.4 %, in Namsky ulus – 80.3 %, in Ust-Maysky ulus – 81.6 %, in Srednekolymsky ulus – 81 %, in Tomponsky ulus – 74.5 %, in Megino-Kangalassky ulus – 71 %, in Yakutsk – 67 %" (Nikolaev, 2007).

Russia is a northern country. According to sociological research of 2011, "In the past five years, more than 5,000 schools have closed in the country", which did not happen even during the Second World War. Over 70 % of first-year students who entered universities

based on the Common National Examination results showed a very poor progress at the end of the first half-year. High school students began to 'escape the CNE' in advance transferring to vocational schools and colleges, since secondary school set a frightening record in terms of academic underachievement in the past academic year. The question: 'What is your estimate of the financial situation in your family?' was answered by every fifth teacher as follows: 'We struggle from paycheck to paycheck and often have to borrow, let alone savings' (Ziyatdinova, 2011). In this situation, the words of Berdyaev (2015) are as relevant as ever: "Creativity is inseparable from freedom. Only a free one creates. It is only evolution that is born from necessity, while creativity is born from freedom".

The authors have compiled five factors based on the research findings received by American scientists, they are as follows: effective school leadership, acquisition of basic skills, a well-ordered reference environment, high academic progress standards, frequent students' performance evaluation (Vasilenko et al., 2010; Morin, 1999; New Visions Schools and New Century High Schools. 10 Principles of Effective Schools, 2005; Munroe et al., 2013). These studies note that the most important points contributing to school performance improvement are well-structured and purposeful use of teacher's time, self-education, a beneficial impact of support from school community, including the society.

These issues require investment of additional funds to provide schools with what is necessary for adequate instruction up to the world standard. The Republic is a beneficiary region, sufficient budgetary funding takes underfilled rural schools a lot of time. Under the recessional conditions in the country, attending the wishes of schools is an unlikely hope. Attracting families is a measure with no chance to success, since 1/3 of the rural population in the Republic collect salaries from the budget, 1/3 lives at the expense of various state benefit statements, and 1/3 does not have steady source of income. In that situation, it is difficult to ensure development of "civil society, without whose participation, one will not be able to solve the problem of providing quality education..." (Zair-Beck & Tryapitsyna, 2006). The only hope is that "it is not society that determines human nature, it is rather human nature (innate needs and abilities) that determines the society" (Kumarin, 2004).

The next problem refers the amount of motion activity in children of the North during prolonged winter. Exercise therapy center specialists point out that schoolchildren in Russia stay completely or relatively motionless 18 hours a day, therefore, they recommend 4-5 physical education classes per week, with energy consumption up to 3100-4000 kcal (Manukhina, 2015). The lack of motion activity, poor nutrition at school and in family lead to overweight. Thus, children have been already programmed in the childhood to get serious disorders in the cardiovascular system when growing up. Most students are reported to prefer physical education and technology classes not because they like these subjects, but because they include motion, dynamics, and, therefore, joy. Everyone understands this, but there are no forms yet that could provide such a state for a child's growing body to the maximum extent possible. According to the authors, developed countries tend to proceed from the didactic model to the one that is rather based on cooperation, co-creation and active work.

Based on their own observations and the research materials available, the authors have come to the conclusion that excessively detailed learning process in the form of specific unconnected subjects, insufficient presence of metasubject and system activity approaches in the educational process estranges students from real life, and hence, from natural origins. The authors are convinced that the co-evolution of nature and man has created the man of today. But, first of all, one needs to preserve the vital binding thread of interaction between man and nature in providing life and activity of the younger generation.

Doctor of Philosophy, Professor A. S. Savvinov, analyzing the process of education from the standpoint of genetic epistemology, emphasizes that "any knowledge offered to a student must satisfy two requirements in order to be successfully internalized: 1. to rise to integrity. 2. to possess structural organization of genetically related subsystems" (Savvinov, 2003). Thus, people should conform their lives to these observances, including school education. Otherwise, there will be no progress, since development implies presence of the spirit of withstanding life obstacles and the ability to overcome them. For dozens of centuries of life-

sustaining activity, our ancestors were able to socially adapt themselves and their economies to rough northern environments. This is, in fact, what the genetic disposition of the northern peoples to the environment is.

At the beginning of the CNE experimental introduction into schools of the Republic, the common national examination scores were very low, which possibly indicated low effectiveness of organizational, content-related and methodological issues in perestroika times. Studies have shown that 75 % of graduates do not have sound knowledge, especially in natural sciences. In subsequent years, with reference to certain added demands on the CNE and adoption of appropriate measures by the state education authorities of the Republic, the situation has normalized. The authors' research in recent years has revealed: 1,445 students passed examination in Biology, 771 students in Chemistry, and 1,908 graduates in Physics. According to the analysis of the state final certification results, the average test score in the Republic of Sakha (Yakutia) was 39.3 in Biology (52.5 in the Russian Federation), 43 in Chemistry (in the Russian Federation, more than 57) and 49 in Physics (50 in the RF). In all the three subjects, the threshold was 36 points. The CNE results in science testify to the average level of students' knowledge, and this, of course, will affect their competitiveness upon admission to higher educational institutions. As a consequence, in the next few years there will be a shortage of highly trained professionals in the field of medicine, ecology, technology and other upcoming sectors. In the future, to progress to the stage of advanced countries like Finland, South Korea, Singapore, etc., a lot will have to be reformed, as the President has noted in his message.

4. Discussions

A number of questions arise: What accounts for such state of matters? First, according to the research, the existing educational system, with a huge leeway in a year, concentrates educational activity only in winter despite apparent shortcomings because in December and January very low temperatures may result in induced school break, sometimes up to 40 days recorded officially. A lack of expediency in the educational process organization is also manifested in the fact that in such extreme weather conditions and adverse emotional factors of the environment, school seeks to increase the intensity of education. As a consequence, spring, summer and autumn time periods are not used effectively. The duration of holidays reaches one hundred days and more. One may wonder: Why are such breaks in students' cognitive activity allowed? Despite the known fact that a long break, most likely, derails a certain amount of knowledge accumulated for years.

Any system must eventually reform and improve its organizational form in order to adapt to the changing pace of the life developments in social progress. If this does not happen, the new remains wanting. There are many examples when enthusiasm of young teachers is enough for a very short period of time after which they leave the school. Therefore, in the current educational system, a latent opposition to progressive education technologies has developed, since most educators who came to school back then with the intention to express themselves without implementing their ideas in practice, have grown aggrieved and lost the aspirations for better. One cannot help but recall the story 'Ionych' by A. P. Chekhov in this respect. Similarly, regardless of their abilities but under the pressure of the system, most teachers do not work in full force. The authors believe this to be the main reason why men do not tend to work in modern schools since they are naturally intended to work towards a result. There are only 21 % of men employed in the educational system of the Republic. Meanwhile, the presence of a male teacher at school is the basis for a creative, strong principle in the teaching and educational process as evidenced by historical periods of the formation and development of school education, both throughout the country and in the Republic.

Second, school is basically in the World Wide Web, that is, the Internet; therefore, information required for sound education will increase many times. Even now, mankind cannot cope with a huge flow of information, so it is necessary to develop a new system for forecasting, planning, organizing, normalizing, monitoring the physical and mental loads in the educational process and to apply innovative solutions to school education that would

activate the entire team of an educational establishment. Piaget (2001) argued that "the cognitive process is impossible without structuring carried out due to subject's activity". Proceeding from these inferences, the authors propose to have the working pattern of schools under the extreme conditions of the North and the Arctic overhauled following the principle of natural conformity.

Another equally important issue concerns the interaction of a teacher and a student. Why did universal schools appear in Finland and distance education is developing at a fast pace? The authors' observations and study of the educational system in Finland in 2008 showed that the emergence of another source of knowledge – the Internet, which gives a student extensive knowledge beyond subject education in general educational establishments, increases knowledge competition between a teacher and a student. The level of expertise of a schoolteacher is in most cases limited to the knowledge of their subject. At the present time, even the teaching staff of a school cannot guarantee that only subject teaching or the intramural form of study makes quality instruction possible. Therefore, schoolchildren should devote a part of time to studying individually and creatively, that is, remotely, that would allow them to comprehend the acquired knowledge in practice using their mental abilities and training the psychoemotional sphere. Health care workers warn us about a psychological overload of children due to intensification of the educational process leading only to a prolonged sedentary mode of life.

Comprehensive schools in Russia mostly teach 23 subjects. Rural educational establishments are short of Chemistry, Biology, History and Foreign Languages teachers. Curricula provide a small number of hours for these subjects, so the teachers of these subjects fail to get a full academic workload. Therefore, a teacher is forced to teach 2-3 subjects, which ultimately affects the quality of education. Given the specifics of underfilled schools, the Ammosov North-Eastern Federal University trains teachers for such related specialties as teacher of Russian and English; Mathematics and Computer Science; Yakut Language, Literature and English Language; Yakut Language and History of World Art. Thus, the principle of metasubject approach is implemented in teaching staff training, which, with adequate development of the Internet system in the Republic and a qualitative selection of teaching and educational principles, will make universality of teachers and educators possible to achieve.

It turns out that is not so easy to achieve because "the main contradiction in the traditional educational system is proclamation of lofty humane goals while it is not feasible to effectively progress towards the goal because of disharmonious brain building (a thinking and health deterioration crisis), as well as the lack of foundation of universal laws" (Maslova, 2017). Natural conformity or the formation of students' ability to think in accordance with nature is referred to as natural laws of the world. Where to find these laws? Doctor of Psychology Maslova states: "Training holistic thinking is a psychological and pedagogical process of transforming predominantly sinistrocerebral mode of thinking into two-hemispheric mode of thinking (holistic thinking)". The thinking integrity, according to the analysis of scientific effort on this issue, is based on 12 principles of natural conformity: environmentalization, systemacity, harmonization, humanization, instrumentality, personality-centered education, outstripping development, simplicity of cognition, cost effectiveness, intellectual security, projected thinking, being non-manipulative and creative. If these principles are effectively used, it is possible to attain universality in education. At the same time, the main thing in education and training is the basis: "A true educator achieves a nature-aligned harmonious education of his pupil, namely: developing (eliciting) his internal forces through excitation, rather than accumulation (pile-up) of educational material..." (Maslova, 2017).

Third, a teaching methodology is not just a transfer of information and control over its uptake but, to a greater extent, is the art of communication: the ability to creatively establish the closest internal and external contact with learners. Yet, is it possible to be on one's creative game on a daily basis when the same thing is repeated in the same room with the same persons for many days, months, years? Meanwhile, why do the students of Alekseev's experimental school show consistently high, excellent results, although they deal with the same curriculum for six years? After all, students attend comprehensive schools for

eleven years but do always receive proper quality education. How to explain this? What are the reasons?

In the authors' opinion, all of these issues must be addressed, first of all, by organizational means through introduction of innovations in the educational process based on children's motivation to learn and to develop their flairs and faculties. All this must be accompanied by immeasurable love for children, unreasonable commitment and an immense will to accomplish what has been conceived. This is the way People's Teacher of the USSR M. A. Alekseev was, whose 100th anniversary has been solemnized by the Republic's community this year. Unfortunately, there are few such spiritually strong, talented, unshakable, dedicated personalities. To become like him, one must live his life and have similar personal qualities (Fedoseev, 1994).

The second way is also premised on the groundbreaking idea and commitment of a teacher to transform a person. In this respect, a high professional standard of enthusiastic teachers M. A. Alekseev (Fedoseev, 1994) and D. P. Korkin (Pesterev, 2001) involves psychophysiological modification of the mental abilities and physical capacity of each learner applied to educational programs, scientifically managing the teaching and educational process.

The third way is based on achieving a synergy of many factors: cooperation of teachers of particular subjects in a committed teaching team that would rely on the enthusiasm of many teachers because collective intelligence is attained in the course of well-coordinated work. This way requires of teachers to realize the principles of democracy, to compare their views with the groundbreaking idea, to unanimously elect a leader that would ensure trust and mutual understanding in the teaching team and in relationship between teachers and students. For example, a similar phenomenon has developed in the teaching team of Nizhny Kuranakh gymnasium of the Aldansky District under the leadership of R. S Ulybina. Such a fortuitous combination in a team of like-minded teachers is very rare.

Of course, there may be other ways to reach the stated objectives that are to be further explored, but the authors propose another way, more suitable and socially effective, taking into account the climatic and geographical features of the human environment. In this case, this is allowance for temperature differences in the Republic with a contrast of up to 1000° C. It should be taken into account that the main mechanism that ensures the pace of human life, that is, metabolism, in different periods of these temperature drops can have different structures, therefore, can have different qualities manifested in the energy supply of the northerners' bodies. Of course, in view of the lack of scientific research into this phenomenon, the authors' assumptions can only be of hypothetical and theoretical nature. Nevertheless, when studying the problem, the authors come to the understanding that awareness of this connection between the body and the climate should lead to human activity being commensurate with nature, which, undoubtedly, can only yield favorable results. Cicero (1914) argued: "Nothing is more finished, more nicely ordered than nature", which is confirmed by thediscoveries of such a young science as chronobiology.

In this respect, the authors have taken an interest in observations by Ignatiev-Bilge (1995), who collected invaluable material about economic activity planning by the northern people depending on the seasons. The brochure was written in the Sakha language, so its abridged content is presented below. According to his research, the ancestors of the Sakha people determined spring as 78 days divided into 5 parts:

1. The onset of spring signs lasts 29 days, from March 17 to April 14. The air gets warmer after cold winter, the sun swiftly rises higher. On March 18, day and night are equal in duration – 12 hours each.
2. Melting of snow lasts 21 days, from April 14 to May 5 – from the washout of ways by thaw water until ultimate melting of snow.
3. Awakening of spring lasts 16 days, from May 5 to 22 – from the appearance of first snowdrops till the end of birch leaves growth.
4. Spring blossom lasts 12 days, from May 22 to June 3. Greenery appears on pastures.
5. Pre-summer time lasts 11 days, from June 3 to 14. This is time before briar blossom. Since June 3, they moved to a summer dwelling place – sayilyk.

Summer (75 days) was divided into 3 parts:

1. Early summer lasts 28 days, from June 14 to July 12. The willow shrub flowering is coming to an end. On July 6, they began to gather medicinal herbs. On July 19, the length of daylight is fully established; wild strawberries, blueberries, red currants ripen. Since July 25, the daylight is on the decrease.
2. High summer lasts 21 days, from July 12 to August 2.
3. Late summer lasts 12 days, from August 2 to 14. Since August 2, there are night signs of upcoming cold. By August 10, black currants ripen. August 14 is the peak haying season.

Autumn is also divided into 4 parts and lasts 67 days:

1. Early autumn lasts 28 days, from August 14 to September 14. It is time of early frost.

2. Depth of autumn lasts 11 days, from 14 to 25 September. September 14 is time to move to winter house and prepare for winter.

3. High autumn lasts 10 days, from September 26 to October 5.

4. Pre-winter time lasts 17 days, from October 5 to 22.

Winter is divided into 3 parts and is equal to 146 days:

1. Early winter lasts 58 days, from October 22 to December 19. This is time before the maximum decrease in sunlight.

2. Dead winter lasts 43 days, from December 19 to February 1. On December 19, the day and night length becomes equal; from December 26, the day length begins to grow.

3. End of winter lasts 46 days, from February 1 to March 17.

This was the year cycle for the Sakha people. The authors' observations of the teaching and educational process indicate that these natural cycles can be used as the basis for organizing the school lifestyle pattern. Undoubtedly, each ethnos has its own calendar dependent on the climate, geographic conditions and adapted to the traditional way of life commensurate with the natural rhythm. This traditional knowledge used to serve people as a mechanism for social adaptation to local conditions and to facilitate their lives. These traditions were handed down from generation to generation. Nature taught people to adapt even to the alternation of seasons. For example, in the course of evolution, "at the approach of winter but before it sets in, many mammals form a significant layer of subcutaneous fat, the coat becomes thick, etc. It should be noted that natural factors affect both animal and human bodies" (Agadzhanyan & Petrova, 1996). Hence, it follows that with the onset of early cold, the body of a northerner adapting to extreme winter conditions enhances its energy functions. This sign is marked by the Sakha apt saying 'Күһүҥҥү киһикүлбүтүнэн' ('Joyful autumn warms the winter'). This period, as previously noted, falls on the beginning of August, and it is therefore suggested starting the academic year from August 1 to use this body property for a favorable, purposeful and organized knowledge acquiring and students' health improvement.

August in Yakutia is the most fruitful month, and the activities of children can be directed to nature study, to obtaining a positive effect in spiritual development, since knowledge of natural forces is not abstruse or excessively theoretical, but rather ostensive and practical. Instruction in this period could actively awake creative aspirations of the northerners in terms of invigorating the spirit, body and mind. A person who knows nature well and is in love with is always strong in spirit. They, figuratively speaking, are fueled by the juices of the native land. Environmental Studies, Botany, Biology, Chemistry, Mathematics, Physics, History, National Culture, Physical Education and other classes should be taught outdoors, in the open air. Such a life and activity arrangement of schoolchildren will make their bodies ready to better handle the cold and to adapt in the extreme conditions of the North. Such an approach would inspire not only students, but teachers as well, first of all. All of them would meet inclement winter stronger and better prepared, combining the warmth and coolness of autumn. "Tempering is especially effective through the alternating action of low and high temperatures" (Agadzhanyan & Petrova, 1996). In addition, the authors believe when a student learns and enjoys themselves, they become spiritually pure, healthy, and more intelligent.

The end of September and the beginning of October (September 25 to October 5) is the period when there are huge temperature swings: it takes turns to rain, to snow, to be windy, and then dead calm. Of course, this does not affect only the diet change and quality, but also the mood of schoolchildren. In this regard, it would be better to plan assignments for submission, tests and examinations for this time, since students are as active as possible in this period, and this energy should be used more expediently to concentrate on testing their ability and capability. According to the authors, taking these conditions into consideration would contribute towards the quality of education.

In the period of severe cold, from December 19 to January 31, in order to prevent the child's body from frequent cold-related diseases, to save energy and other sources of heat, fuel and lubricant materials and, most importantly, to protect children from accumulated fatigue, it is suggested planning long New Year holidays. In winter cold, when even large animals hibernate because of scarce sunlight, in the period of low vitality of all living beings, children should get enough sleep. In the current routine, parents have to roust children out of bed early in the morning, to feed and get them off to school at temperatures of 30-35 degrees below zero when the child's body is not protected naturally. The temperature difference for a sleepy child exceeds 50° C; however, at this time the educational process in schools is intensified, all test classes fall within this period. As a result, most children have health concerns even at school age.

According to the authors, children should spend this period in the bosom of their families and associate more closely with parents, brothers and sisters. It is then that family education, remote education, self-education and other ways of individual improvement can become more effective. At this time, it is also possible to arrange for educational and awareness-raising television programs.

Thus, in determining the winter vacation period, the main criterion should be the body decreased activity due to cold and lack of solar energy. The starting point should be the time of minimum daylight, December 22.

Examinations and various tests can be scheduled for March and April, that is, for the period from March 17 to April 20, when there is also an intensive change in weather conditions associated with a transition to spring. In this period, the body is not yet fully powered as needed, so it is advisable to give outdoor classes in order to use solar energy. Vacation time, if possible, should be set from April 20 to May 6 when the amount of micronutrients in the body is reduced to its minimum. That is what Yakuts say about this season: 'Сааскы кини салбаммытынан' ('Man in spring just licks his lips out of hunger'). Twice Nobel laureate, Dr. Wallach (2004) explains natural death of people and animals by malnutrition, that is, nutritional deficiency.

From May 6 to June 11, the most favorable period for outdoor activities comes; in early May, one can organize a republican environmental movement of schoolchildren.

In June, during the national holiday 'Ysyakh' on June 21-25 at the maximum solstice, one could teach National Culture classes. After all, a focused effort for regeneration of peoples' culture is the basis of morale building activities. At the same time, the eagerness and initiative of parents and the public can be instrumental in teaching and educational work. On the days of the national holiday 'Ysyakh', against the background of universal elation, one can solemnly conclude the academic year.

According to this concept, the academic year for elementary school is as follows:

1 semester:

Academic studies last from 01.08.05 to 05.09.05 (5 academic weeks). Break from 06.09.05 to 11.09.05.

Academic studies last from 12.09.05 to 06.11.05 (8 academic weeks). Break from 07.11.05 to 12.11.05.

Academic studies last from 14.11.05 to 17.12.05 (5 weeks). Break from 18.12.05 to 31.01.06.

2 semester:

Academic studies last from 01.02.06 to 05.03.06 (5 academic weeks). Break from 07.03.06 to 12.03.06.

Academic studies last from 13.03.06 to 30.04.06 (7 academic weeks). Break from 01/05/06 to 09/05/06.

Academic studies last from 10.05.06 to 17.06.06 (6 academic weeks). Break from 18.06.06 to 31.07.06.

Starting from August 15, lessons for 2nd, 3rd, 4th grades were taught in the out-of-doors: (Mathematics, Reading, Environmental and Regional Studies, the World Around, Physical Education, Health Hours, National Culture of the Peoples of Yakutia, Industrial Arts, Art, and Music). Introduction to the World Around, Hours of Agricultural Work, Natural History classes were given at the young naturalist station, etc.

The authors used previously studied data on competition loads planning in the annual training cycle of athletes and research that determined fitness levels according to the Erel (Hope) standards (Fedorov, 2006). An agreement was signed with the Ministry of Healthcare of the Republic and the Central Ulus Hospital on annual medical monitoring of children's health at the beginning and at the end of an academic year and on adoption of preventive measures.

With reference to the change in the academic year cycle, a respective redistribution of the program teaching material is assumed. The primary goal of educational process is to maximize the use of the natural environment. Health protection and reliance on the original traditional way of life and activity, material and spiritual culture of indigenous inhabitants of the Nordic region is becoming an overriding priority for an educational establishment.

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5. Conclusion

Upon the research, the following positive results were obtained:

1. The incidence rate of acute respiratory diseases in schoolchildren has decreased by 30 %.

2. Teachers and parents have noted an increase in students' creative initiative in outdoor classes in August, May and June. Children start to feel freer, more independent and curious, which contributes to their overall development. According to the students themselves, they learned a lot about the world around them.

3. Teachers have also noted that a long vacation during the winter cold helped to relieve fatigue, improve health, and enhance creative effort.

4. A long interruption of work in December and January saved about 700 thousand rubles in the budget of one of the experimental schools. If multiplied by 649 schools, this would make fairly impressive Republic's budget savings.

5. A major obstacle to the implementation of this working pattern in the educational system of the Republic of Sakha (Yakutia) is a regulatory act on the National Educational Standard in the territory of the Russian Federation. Therefore, in order to improve the quality and efficiency of education in the Nordic and Arctic territories, it is necessary to have variational regulatory acts that would take into account the specifics of the national and regional educational system in the conditions of the North and the Arctic.

The experimental work has yielded significant results in improving the quality of education, but at the same time, the analysis of the results of All-Russian Medical Examination has revealed a very alarming situation in schoolchildren's health status. The clinical examination covered 95.7 % of children to find out that 56.1 % of them had health disorders. This is caused by a host of objective and subjective factors. To eliminate this problem, it is necessary to take managerial decisions that would consider the natural and climatic, socioeconomic, national and regional, cultural and social characteristics of the Republic of Sakha (Yakutia). Taking into account the principles of natural and cultural conformity in the specific conditions of the North and the Arctic would make it possible to preserve the original traditional economic set-up and nomadic life of indigenous peoples of the North, to develop native languages and regenerate the unique culture of northern peoples.

These specific features are an important factor in substantiating the methodological basis for

harmonizing school education on the basis of natural and cultural conformity. Introduction of this idea will result in invigoration of students' bodies, an increase in their creative activity and personal intellectual development, improvement in education and training quality.

To implement the above innovative environment in the educational establishments of Yakutia, it is essential to adopt regulatory acts in education that would take into account the specifics of the Nordic and Arctic territories of the Russian Federation.

References

Afanasyev V.F. (1966). School and the Development of Educational Thought in Yakutia. Yakutsk: Yakutknigoizdat.

Agadzhanyan N.A. and Petrova L.G. (1996). Man in the North. Moscow: KRUK.

Berdyaev N.A. (2015). Philosophy of Freedom. Sense of Creativity. Experience of Human Justification. Moscow: Academic project; Ekaterinburg: Delovaya Kniga.

Cicero M.T. (1914). On the Ends of Good and Evil. London: William Heinemann; New York: The Macmillan Co.

Danilov D.A. (2015). Problems of cultural-historical evolution of the Sakha (Yakutia) Republic's education system in 20th century. Humanities and Natural Sciences Actual Problems, 5-3, 20-23.

Dewey J. (1916). *Democracy and Education. An Introduction to the Philosophy of Education*. New York: Free Press.

Durkheim E. (1961). Moral Education: A Study in the Theory and Application of the Sociology of Education. New York: Free Press.

Fedorov N.V. (2006). Education - the Basis for Solving Social and Economic Problems. Moscow: Helios ARV.

Fedoseev I.E. (1994). Teacher from the God: Story about the People's Teacher M.A. Alekseev. Yakutsk: Bichik.

Gabysheva F.V. (2015). The Formation of Civic and Ethno-Cultural Identities in the System of General Education. Ethno-cultural education in the Far Eastern Federal district of the Russian Federation, The series «Ethno-cultural education», 1, 28-38.

Grigoryev S.I. (2009). Cultural-Centricity and Competence in Modern Social Education. Moscow: Russian State Social University Press.

Ignatiev-Bilge N.L. (1995). Fortunetelling and Prophesies. Vilyuisk: District Printing House.

Kaznacheev V. P. (2012). Health of the nation, culture, futurology of the XXI century. In A. V. Trofimov, (Ed.), Selected articles and reports by V.P. Kaznacheev (2007-2012). Novosibirsk: Western Siberian Branch of the International Slavic Academy of Sciences, Education, Arts and Culture.

Kumarin V.V. (2004). Pedagogy of natural conformity and school reform: scientific publication. Moscow: Public Education.

Manukhina L.S. (2015). Strengthening adolescent health through physical education and sports. URL: http://oovfd.ru/статьи/укрепление-здоровья-подростков/.

Maslova N.V. (2017). Noospheric education. How to turn learning into a natural cognition of the world. A handbook for teachers. Moscow: Conceptual.

Morin E. (1999). Seven complex lessons in education for the future. Paris: UNESCO Publishing. URL: http://unesdoc.unesco.org/images/0011/001177/117740eo.pdf.

Munroe E.A., Borden L.L., Orr A.M., Toney D., Meader J. (2013). Decolonizing Aboriginal Education in the 21st Century. McGill Journal of Education, 48(2), 317-337. URL: https://www.erudit.org/en/journals/mje/2013-v48-n2-mje01045/1020974ar/.

Neustroev N.D. (2009). Yakutia's rural low-competent school in the innovative development conditions. Yakutsk: Yakutsk University Publishing House.

New Visions Schools and New Century High Schools. 10 Principles of Effective Schools.

(2005). URL: https://www.newvisions.org/page/-/Prelaunch%20files/PDFs/10%20Principals%20of%20Effective%20Schools.pdf.

Nikolaev M.E. (2007). On a new paradigm for the development of education. URL: http://nlib.sakha.ru:83/index.php/ru/2008-11-03- 08-01-16/49-2007-08-23-.

Pesterev V.I. (2001). Yakutia's history in persons. Yakutsk: Bichik.

Piaget J. (2001). Psychogenesis of knowledge and its epistemological significance. In Yu.S. Stepanova (Ed.), Semiotics: An Anthology (pp. 98-110). Yekaterinburg: Delovaya kniga.

Savvinov A.S. (2003). Personality: the social, cultural, individual. Yakutsk: Yakutsk University Press.

Subetto A.I. (2009). Noospheric educational community as a society of social responsibility of the XXI century. Moscow: Russian State Social University Press.

Sudakov K.V. (1999). Systemic construction of human functions. Moscow: Anokhin Research Institute of Normal Physiology Press.

Vasilenko V.N., Grigoriev S.I., Patrushev V.I., Subetto A.I. (eds.). (2010). Man and Society: Noospheric Development: monograph. Moscow: LemaLLC.

Vinokurova U.A. (2015). Ethno-cultural Education cluster. Ethno-cultural education in the Far Eastern Federal district of the Russian Federation, The series «Ethno-cultural education», 1, 85-93.

Wallach J. (2004). Dead doctors don't lie. Berkely: Wellness Publications.

Walters S. (2015). School Climate: A Literature Review. Oakland: Temescal Associates. URL: http://www.temescalassoc.com/db/el/files/2015/02/School-Climate.pdf.

Zair-Beck E.S. and Tryapitsyna A.P. (2006). Training of specialists in the field of education for the participation and use of international programs for assessing the quality of education for all: a national vision: Recommendations on the results of scientific research. St. Petersburg: A.I. Herzen Russian State Pedagogical University Press.

Ziyatdinova F.G. (2011). The social situation of teachers: expectations and realities. URL: http://ecsocman.hse.ru/data/2011/02/23/1214891722/ Ziyatdinova.pdf.

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