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Moscow Higher Education Institutions: Eco-ergonomic Aspects of Operation and Environmental Initiatives

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Abstract

In the article, the coauthors analyze the ecological and ergonomic aspects of operation of Moscow-based institutions of higher education within the framework of the notion of the learning environment and the concept for the transformation of present-day cities, developed by V.A. Ilyichev, a prominent Russian researcher. The issues, considered in the article, encompass the ecological law violations and environmental initiatives. Besides, the coauthors provide the findings of the comparative analysis between the ecological initiatives, launched by the Moscow-based higher education institutions, and those implemented by the universities based in Europe. The coauthors believe that any ecological initiative may be successful if perceived by each lecturer, student and postgraduate as his or her personal philosophy.

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1. Introduction

The mission of higher education is to disseminate professional knowledge, to support research initiatives, to promote culture by means of teaching students and getting them involved in fundamental research projects in the natural/engineering sciences and humanities at each level of learning. Nowadays Russia's higher education serves to build cultural and professional competencies. According to the Federal State Standards of Education (FGOS), a

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competency represents a combination of the in-depth understanding of the content of specific disciplines, and the competence, or the ability to apply the information, derived in the process of learning, in the course of the work performance. [1] This competency building approach is applied to develop students, or future specialists in versatile areas of knowledge, who must know how to formulate and attain objectives, how to solve professional problems, and how to get accustomed to the ever-changing social, political, economic, and professional environments.

2. Research Methods

As for the Moscow institutions of higher education, we need to identify and classify the extent of their compliance with the Federal ecological legislation, and the composition of the ecological initiatives that they take and implement. First of all, we classify the ecological and ergonomic violations, committed by the Moscow institutions of higher education, using the criteria of their interference with the educational process. The violations that interfere with the educational process include overcrowded classrooms typical for both old-style and new buildings that are designed to the contemporary standards of ergonomics. The problem of overcrowded classrooms may be resolved through the application of management control methods by the university executives. Another frequent violation that interferes with the educational process consists in the insufficient lighting of classrooms. This violation may be easily resolved by the technical departments of higher education institutions. Besides, many higher education institutions fail to arrange medical screenings for their professors and lecturers, while annual medical screenings of the teaching and lecturing staff are obligatory in accordance with the Federal Law on Education in the Russian Federation. [14] Besides, Moscow institutions of higher education frequently violate the sanitary regulations that are effective in the Russian Federation and that set the requirements for the ion composition of the air inside production facilities and public buildings. The violations include the insufficiency or surplus of air ions. These violations may be committed in the rooms that have items of machinery capable of generating electrostatic fields when in operation. [15] The rooms, accommodating video display terminals and similar items of equipment, must have air ionizers or deionizers. However, contrary to the law, some universities fail to install air ionizers or deionizers for various reasons, including insufficient funding and little attention paid to the issues of ergonomics. Several universities violate the hygienic requirements applicable to the microclimate of workplaces inside classrooms. The intensity of the energy expenditure by lecturers, employees, and students working inside particular classrooms, the amount of time needed to complete specific assignments, and the season of the year determine the acceptable microclimatic conditions. The hygienic requirements also comprise the methodologies designated for the measurement of the values that describe the microclimate inside classrooms. Microclimatic conditions, including the temperature of the air and surfaces, relative humidity and air velocity, as well as the thermal exposure intensity must maintain the thermal balance between humans and the environment to assure the optimal or, at least, acceptable thermal status of the human body. [16]

When we analyze the violations of the ecological, sanitary, hygienic and ergonomic legislation, that do not interfere with the educational process and that are committed by the Moscow institutions of higher education, we realize that any university or college acts as an organization of permanent operation, a proactive consumer of electric energy connected to the urban engineering networks, and a source of various hazardous emissions. As a rule, universities and colleges have laboratories designated for student and academic research. Some laboratory rooms accommodate machines that are the sources of electromagnetic emissions or radiation. Any university has cafeterias, printing offices, a fleet of vehicles, dormitories for students and lecturers, sports centers, and warehouses. Many laboratories, fleets of vehicles and printing offices are the sources of air pollutions. According to the data provided by the Federal Service for the Control over the Protection of Consumers' Rights and Human Welfare, the number of sources of emissions within the areas, occupied by Moscow universities and colleges, is equal to dozens. Over twenty hazardous substances, namely, nitrogen dioxide, phenyl methane, ethanol, etc., emitted by Moscow-based universities, pollute the air. [17] The most frequent violations of the ecological legislation include (1) the failure to store mercury and mercury-containing devices, namely, fluorescent lamps, in the appropriate manner, and (2) the failure to install appropriate solid waste storage containers. [18-19] Some Moscow-based universities install solid waste storage containers on the sites that are not designated for them; moreover, several Moscow institutions of higher education have no sites for solid waste storage containers.

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