

resolution 1680x1050 is combined with ultrahigh operating speed, the response time (grey-to-grey) 2 msec and the dynamic coefficient of contrast up to 3000:1 are achieved. In the construction VX1940w several entries are supported, it guarantees wide view angles (170° horizontally and 160° vertically) and brightness 300 cd/m² – that makes it a perfect solution not only for games, but for DVD viewing and work with traditional applications as well.

In audio cards the sound quality can differ in various motherboards. Even using the same codec models. The quality of the used auxiliary elements, condensator, in particular; the arrangement on the card; the proximity of the components able “to admix” unwanted sounds to the signal play a role.

So, the codec ALC885 meets the requirements of Microsoft Windows Vista Premium, has the signal/noise ratio 106 dB for the digital-to-analog converter (DAC) and 101 dB for the analog-to-digital converter (ADC). Therein the 192 kHz sampling rate support, ten-channel DAC-sound, and also HD DVD support are realized.

All the computer industry last words are carried by the Raser Barracuda AC1 card. The external package of the card serves as a cooldown radiator and form for interfaces.

The eight-channel DAC AKM 4396 and operational amplifiers JRC 4580 are better in quality than in Creative X-Fi Extreme Music/Platinum/Fatality. The chip cards CMI878 C-Media excels by the ability to reproduce correctly the sampling rate of 44,1 kHz, apart from 48/96/192 kHz; the choice of pedestal frequency being possible to be performed manually.

The most reliable and qualitative audio card Creative X-Fi Elite Pro has more failproof DAC (Cirrus Logic CS4398) and operating amplifiers of the X-Fi-series. It has 4 DAC, two channels, dynamic range of 120 dB. For providing maximally qualitative supply there are large groups of electrolytic capacitors. The processor frequency is 400 MHz. The inputs and outputs commutation is performed with the help of electromagnetic relays, substituting electronic switches, that increases the reliability and sound transmission integrity.

Also in this card ones of the currently best amplifiers are used: JRC2114 and JRC2068. The bandpass flatness (from 40Hz to 15 kHz) makes +0,03, -0,08 dB, noise content - 103,6 dB (A), dynamic range - 103,2 dB (A), harmonic distortions - 0,0025 %, mutual penetration of channels - 104,4 dB.

Using a new laser mouse pointing device with antibacterial coating LEXMA NanoGuard one can be sure to eliminate and deactivate bacteria with 100 % efficiency factor. A potent laser

unit performs the sensor’s resolution ratio of 2000 DPI. The reading speed is 40 times higher than in a usual optical mouse. The programmed keys support more than 50 customizing settings. It runs on any surface including glass.

Using a new DVD-18 format (dual-sided double layer one) for standard disks of 120 mm, one can obtain the capacity of 18 Gbytes and even 51 Gbytes (for three layer disks of 17 Gbytes per side). The Blu-ray technology disks are more promising. Using double layer Blu-ray carriers the information storage capacity up to 50 Gbytes is obtained. Six layer disks of 200 Gbytes capacity have been already created. Eight layer disks of 300 Gbytes storage capacity are being developed.

The holographic principle of disk storage information appears to be a more promising and brought to the real application one. On a standard disk of 120 mm at the reading speed of 120 Mbytes/sec one can record up to 1,6 Tbytes of information.

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THE ROLE OF COLOR FACTOR IN INNOVATION EDUCATION TECHNOLOGIES

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The necessity of education process constant perfecting for a successful work of a university in the educational market makes the problem of innovation education technologies introduction into the higher education system actual. It allows offering new possibilities, flexibility in training and brand new education to students.

The innovation education technologies currently applied in Russian higher education institutions can be relatively divided into three groups: the technologies of educational information provision; the technologies of educational information delivery; the technologies of educational information storage and processing. At the realization of educational programs the educational information delivery technologies, which guarantee the educative process and its support, acquire a special value. First of all, it is referred to newly created electronic textbooks, distance teaching courses and also information knowledge bases, reference and expert systems used for educational purposes. The information presented in them, unlike the poly-

graphic one, should have an absolutely different organization and structure. It is conditioned both by psychophysiological features of information perception from the computer screen and the information access technology. In the interactive media a great attention should be paid to the image thinking promotion owing to the technologies activating the dextrocerebral, synthetic thinking. The presentation of the educational material should reproduce an idea in the form of images. Therefore, the main moment in the innovation education technologies becomes the knowledge visualization.

Video-lectures, multimedia-lectures, electronic textbooks, computer teaching and testing systems, simulation models and computer simulators, tests and video-conferences are referred to the innovation education technologies. We think that in the academic process not the information technology on its own account is important, but the fact how its application serves the achievement of educational purposes proper. The choice of teaching aids should be defined by the subject-matter, first of all, and not by the technology. It means that at the heart of the technology option the investigation of education courses content, learners' activity, their being involved into the academic process, concrete aims and expected results of education should lie.

At the present time the developing effect of new education technologies reveals itself not always; their influence on the process of information adoption is not controlled. However, without defining the most significant factors promoting optimal perception and material memorizing, the innovation teaching aids can be inefficient, and in some cases – even destructive.

The color is exceptionally significant in innovation education technologies. The topicality of the color application in the innovation teaching aids is defined, first, by the necessity of the developing education principle realization within the system of higher education; second, by the importance of the process of the information adoption by students.

The human response on the color is of a complex character and has several aspects: the *physiological* one, when the sensation from the applied color group or separate color depends on the force and spectral distribution of the emission, its exposure duration on the observer, the observing conditions; the *psychological* one, giving the color credit for an independent and active role, the associative power and the ability to color the human reaction emotionally; the *aesthetical* one, the presupposition of which is giving the color credit for the ability to harmonize the color information.

Natural sciences have collected a great experimental material about the influence of the col-

or on the human body. The physiological component of this response has been studied most fully. Thus, according to the records of Kravkov S., the intraocular tension reduces under the influence of the green color and grows under the influence of the red one. C. Ferre, V. Shevaryova, Ye. Plotnikova and other scientists studied the influence of the color on the fitness to work. After the carried out experiments C. Ferre came to the following conclusions: at a very short-time work the red color raises the efficiency; the blue and violet ones decrease the productiveness much; the interrupted effect of the color, i.e. a rest in conditions of fair daylight after the work at another kind of illumination, increases the productivity considerably.

The color influence on the human psyche touches not only his emotions and character, but also cognitive processes, and, first of all, - thinking. The question, in this case, is not about the informative, but the energetical aspect of the color effect, and so, not about the thinking process content, but about its dynamic and energetical characteristics. From this perspective, thinking appears in front of the subject himself not as a sequence of purposeful judgements and inferences, but as a special psychic tension terminating with a satisfactory disengagement for the subject in the case of finding a solution.

The color can harmonize the learner; it is able to mobilize his resources, appease and relax. This influence comes directly into brain, penetrates all the physiological structures. The organism responds the color flow immediately. This is a true psychosomatic approach, which allows influencing effectively both on physical activity and mental states of a human being and his learning process activation using a color system.

A concrete objective, at the solution of which our project is aimed, lies in studying the color influence on the process of information adoption by the student in new educational technologies, and also in working out the given factor most effective use recommendations in higher school didactics.

Within the framework of the given project we have elaborated recommendations on the color scheme of educational Internet resources. We suppose that the possibility to carry out a simultaneous presentation of information, combining a text, video and graphic images and animation in the computer system, allows creating an academic environment affecting all the channels of perception in most different forms. First, it concerns the work with new lexis, reading, studying new information, the creation of visual impressions, associations. Second, it supposes structuring of schemes using colors bearing a special code, establishing of associative bonds of the given constructions with

the text, etc. The color vision, emerging in the eyes and mind of the human being, bears a meaning content in itself.

The *color* together with the form and type belongs to basic structural materials of web-design. The psychological effect of separate colors and their combinations is closely connected with their position in the chromatic circle. According to G. Frilling there are several color groups giving different sensations.

1. *The colors giving warmth and cold sense.* The red-yellow spectrum part colors evoke the sensation of warmth, the blue-azure spectrum part colors – the sensation of cold. The maximum of psychological warmth sense the orange color gives. A warm color draws the object nearer, makes it visually larger and more active, attracts the attention to it, whereas a cold color moves off, calms, transfers the object to the background of the composition, subjectively reduces the object in size.

2. *The colors promoting the emergence of excitement and tranquilization, activeness and passiveness.* The most exciting action is done by the red color, which is perceived as the most active one. The equilibrium falls on the green color, which combines the lightness and vivacity of yellow with the tranquility and heaviness of blue. When combining active and passive colors it should be taken into account that the first are always perceived more vividly and are better memorized, that is why for the equilibrium achievement they should be delivered in smaller doses.

3. *The colors associated with the senses of time and space.* The greatest sense of removal from a subject (i.e. the space enlargement) is created by the colors of blue-azure spectrum part. The opposite to them orange-yellow colors give the effect of approaching of subjects to the observer. The perception of time in the light f blue-azure colors slows down up to its full stop. The chromatic circle colors on either side of this sector convey the impression of time acceleration. This sense reaches its maximum in the region of yellow and orange colors.

4. *The colors giving the sense of heaviness and lightness.* The blue-azure spectrum part colors of the chromatic circle appear the heaviest ones. This sense reaches its maximum in the region of the yellow color, which looks most airy and light.

Special sensations appear when affecting by different color combinations. The polar color pairs (the colors being opposite each other in the chromatic circle) agree well, especially when they go together against the grey background or are perceived in different planes. Thus, a combination of yellow and blue causes a strong tension, a motion effect; the neighborhood of red and green is per-

ceived optimistically; in the pair of violet and green a concealed accumulated strength is felt; the tearing energy is manifested in the combination of orange and azure.

The non-polar color pairs can give unsuspected effects while their being perceived. Thus red in combination with blue provoke excitement and thrust learners aside. The neighboring red and yellow colors are associated with joy and warmth. Red in combination with golden gives a sense of splendor and luxury. Red in pair with orange causes a sharp temper, etc. While using non-polar color combinations one should take into account that, if the neighbor colors possess approximately the same brightness and one of the colors noticeably exceeds the other on the occupied area, then it “oppresses” its neighbor drawing over its parameters. For example, dim-blue surrounded by bright-green acquires a greenish touch and becomes a little more “colored”. Directly near the boundary of the two colors an opposite tendency is observed – the colors seem to push off from each other and try to stress their differences.

It is not recommended to use the colors disposed too close to each other in the chromatic circle – the dissonance between them simply beats the eyes. The directly opposed colors also seldom make harmonic pairs: green and violet or red and azure usually seem to be too heterogeneous; relatively reasonably only blue and yellow go together.

While formatting an educational site it is important to match correctly the *combination of the text and background*. They should differ on the contrast, color intensity. *Maximally convenient* at long-term reading the combination of *a black text against a white background* is. Among other color schemes providing a good readability of the text there are two groups: the one with a dark text against a light background and the one with a light text against a dark background. Thus, black letters against a yellow background, blue – against white, green – against red, etc., are well perceived by the eye. Any *dark* enough color as a background sounds reserved, noble and even mysterious. A *light* color for a text is perceived especially bright and expressive. It should be born in mind that, if a color is too dark, the eye is inclined to perceive it as black. The same is referred to white: almost any insignificant admixtures (excepting blue) cause a sense of untidiness. To make these colors sound it is necessary to support and develop a needed tincture in other element.

At color matching it is advisable to follow the *principle of unity*, which supposes the web-site formatting with limiting of the used spectrum of every composition up to four colors.

At the present time our research is going on. The novelty of the problem being solved lies in the substantiation of an integrated approach to studying the problem of color factor using in innovation education aids. The significance of the project is in its pragmatism, practical orientation – the results obtained are aimed at executive perfection of the educational process at a higher education institution.

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DATA BASES OF SPSTL SB RAS IN THE INTERNET FOR NATURAL STUDIES

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The main objective of the Department of Scientific Bibliography of the State Public Scientific-Technological Library of the Siberian Branch of the Russian Academy of Sciences (SPSTL SB RAS) is to select and systematize materials on various directions of researches.

SPSTL SB RAS has been compiling databases covering various topics of environmental research, such as “Nature and natural resources of Siberia and the Far East, their protection and rational use”, “Problems of the North”, “Ecology and natural-territorial complexes conservation in West Siberia”, “Biodiversity of Northern Eurasia”, “Sustainable development of nature and society”, “Contamination and environment protection: reference and bibliographic-information issues”. All DBs are bases of a bibliographic type generated under Windows/IRBIS system control, their documents comprise bibliographic descriptions, subject and geographical headings, annotations, translation to foreign publications.

DB “Nature and natural resources of Siberia and the Far North” numbers about 160,000 documents since 1988 on geology, climate, hydrology, soils, vegetative and animal kingdoms, landscape ecology, terrestrial and aquatic ecosys-

tems and natural resources. A wide spectrum of ecological problems such as anthropogenic effect on different components of environment, natural resources conservation and rational use, human ecology, ecological expertise and monitoring, legal, social and economic aspects of ecology.

Multidisciplinary DB “Problems of the North” is also worth paying attention. It includes materials (above 130,000 documents) on various problems of developing Russian and foreign (European, Alaskan, Canadian) North since 1988. It covers biological, geological, geographical, ecological, cryological, social-economic, medical-biologic problems of the North. A special section in the DB is devoted to scanty northern peoples.

DBs “Sustainable development of nature and society” (nearly 35,000 documents) for 1990-2005 deal with prospects of global ecological problems, sustainable development of nature, social and urban ecology, ecologization of industrial production, ecological up-bringing and education.

DB “Biodiversity of Northern Eurasia” (2,500 documents since 1988) touches problems of biological diversity of microorganisms, soils, animals, plants, landscapes, human genome, gene fund of organisms, biodiversity economics, the place of botanical gardens and reserves in conservation of biological diversity.

DB “Ecology and protection of natural complexes in West Siberia” has information since 1988 on various aspects of ecological problems in West Siberia (about 14,000 documents).

DB of guidebooks, manuals and information-bibliographical tools “Contamination and environmental protection” counts 2,700 documents since 1985 and gives summarized data on the most important directories, dictionaries, standards, methodical materials, reviews, domestic and foreign periodicals concerning environment pollution and protection, contaminants, wastes, their disposal and utilization.

Databases are constantly renewed, one can get fresh information for education, training and research at our Internet web site www.spsl.nsc.ru.

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