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The Development of Ecological Culture of Students in the Design and Creative Activity

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Abstract

In this paper, we studied how design and creative tasks in an interdisciplinary base directed to highlight theenvironmental issues, affect the change of ecological culture of students enrolled in different educational programs. Importance of the development of ecological culture in high school is determined by the relevance of environmental competencies of graduates, destined to carry out professional activities considering the environmental security that is needed for "sustainable development" of society. Inquirers helped to reveal the differences in the attitude to environment of students of different educational programs and to show that an environmentally expedient behavior is at the middle and lower levels for most of them. When included in the design and creative activities in accordance with the context of the training set increased environmental culture of the students

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Keywords: student;, design and creative activities; interdisciplinary approach; ecological culture

1. Main text

Professional education in universities provides not only the development and improvement of professional competence, but also an increase of the general cultural level. It is the harmony of the overall cultural, socially moral and professional development that promotes creative formation of a human being in his life. General cultural competence can be attributed to inter-subject and / or above subject. Among these environmental competences as components of ecological culture of personality are the most popular due to the necessity of “sustainable development” of society, and implementation of professional occupation, taking into account environmental safety. Therefore, the development of ecological culture during the process of learning in higher education system, involving a display of ecological competence in a subsequent career, is relevant. Ecological culture is seen as the

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highest expression of human environmental education and environmental competence (Ignatov, 2011). It contributes to the formation of a true human of intelligence and civility. Furthermore, the development of ecological culture of the person acquires the status of public education standard. There is a view according to which education is seen as a necessary condition for the creation and maintenance of a constructive dialogue on environmental improvements (Beyersdorf, Michelsen, & Siebert, 1998). The literature discusses the impact of education on the environmental setting and views of students and adults. The results of these studies often show that in general there is a positive correlation between level of education and personal environmental awareness (Huber, 2001, P.234). Therefore, education is a factor that positively affects the environmental settings: the higher the educational level, the more clear individual guidelines on the protection of the nature (Grunenberg & Kuckartz, 2003, P.54) and higher environmental consciousness (Kuckartz & Rheingans-Heintze, 2006, P.52). However, comparative characteristics of ecological competence and ecological culture of students enrolled in different educational programs, is still poorly understood. We can assume that there is a relationship between the selected educational program and environmental competencies of students, the future graduates, as appropriate training modules of educational programs filled with unequal teaching material, which affects the acquired knowledge, promotes understanding of environmental problems, making judgments and basic everyday behavior of students. Assuming that environmental culture is an integral category that embraces many components, among which most often mentioned are cognitive, emotional-aesthetic, value-semantic and active (Glazachev & Kozlova, 1997), we have identified indicators and criteria that can be used to define high level of environmental culture development of the students:

- The presence of environmental interests, fundamental ecological knowledge and understanding, as well as interaction skills with natural objects,
- Maturity of the system of beliefs and values that characterize the attitude of the individual to nature,
- Update of the environmental relevance of teaching and research work,
- Carrying out the research on environmental issues,
- The constant need to communicate with nature and responsibility for the results of interaction with it.

These indicators were used as a basis of developed by us diagnostic techniques of self- ecological concepts and personal qualities that will allow exploring the features of the development of ecological culture of pupils and students (Asafova, 2003). In the period of 2003-2007 technique was tested, and 600 students became respondents. In testing during 2007-2012 participated 210 students of 3-8 semesters of studies of the Institute of Ecology and Geography, as well as the Faculty of Journalism and Sociology of the University of Kazan. The differences in the levels of ecological culture development of students of these departments were determinted (Table 1). It was defined that the majority (69%) of students studying sociology have an average level of environmental awareness and the majority (51%) of students of the Institute of Ecology and Geography assess their ecological culture as high.

Table 1. Levels of development of ecological culture of students of Kazan University (% of total number of respondents)

Institute/Faculty	Low level	Middle level	High level
Institute of Ecology and Geography	4	45	51
Faculty of Sociology	3	69	28

The analysis of the component composition of ecological culture shows that students enrolled in different educational programs differently evaluate their ecological culture and its constituent components. Students of ecology, nature management departments, future professionals in the field of environmental protection, have the highest amount of points that characterize ecological knowledge (I), environmental beliefs and installation (II), environmental performance (III) (Figure 1). These results are consistent with the direction of training and indicate an effective system of environmental education that focuses on the relationship of students' training with specific tasks on greening the scientific and technological progress. Students majoring in "Meteorology", "Physical and Economic Geography" evaluate the development of their environmental culture and its component lower, compared with students studying on profile training "Ecology", "Nature Management" (Figure 1). Students of the department of sociology

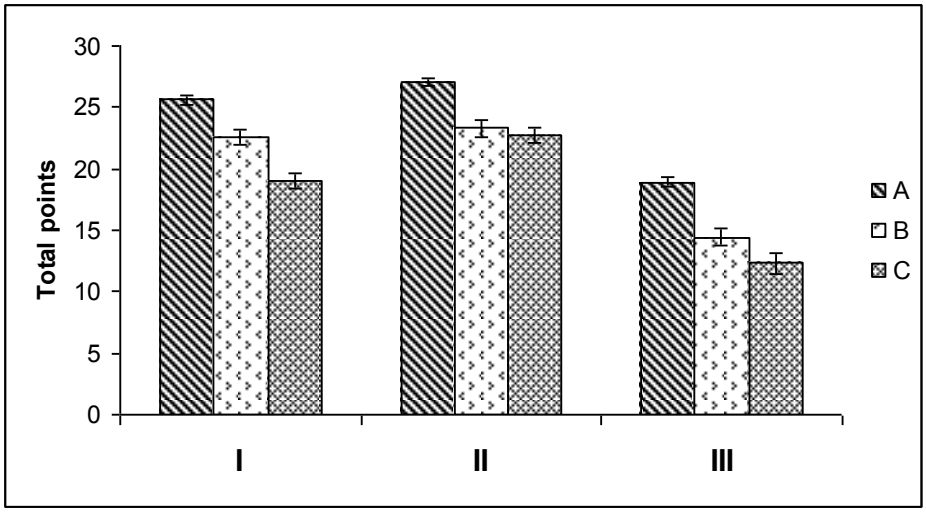

Figure1. Self-esteem of development of ecological culture of Kazan University students: I - environmental knowledge and understanding (the maximum amount of 35 points), II - environmental consciousness (beliefs, attitudes) (the maximum amount of 35 points), III - environmental behavior (activity) (the maximum amount of points 30); A - Department of Ecology, Nature Management students, B - Department of Meteorology, Physical and Economic Geography students, C - Department of Sociology students.

similarly with students majoring in geography or meteorology, assess their environmental consciousness (II), which is manifested in the ecological behavior (III), but describe their knowledge and understanding of ecology (I) 15-25% lower than the students of the Institute of Ecology and Geography. Consequently, the development of environmental culture in universities depends on the specific educational programs and educational and professional activity, in which students are involved. Results of the survey of students using questionnaire characterizing environmental beliefs and attitudes to the environment (Neumann, 1999), are presented in Table 2. Among future sociologists there are 15% less respondents that think about the environmental conditions in which the next generations are likely to live. Attitude toward nature and the environmental behavior of future graduates is also different. Among the students studying ecology, 74% constantly try as much as possible to treat the environment responsibly. This is 10-11% more than among students studying sociology (63%). Among the students of the Department of Sociology, a third (32%) is making significant efforts to behave responsibly towards environment (Table 2).

Table 2. Characterization of students' ecological believes and attitudes to nature (% of positive answers from total amount)

Questions	Institute of Ecology and Geography	Faculty of Sociology
Ecological believes		
I worry when I think about environment, that next generations would probably have to live in	78	63
In my opinion, the problems of environment are greatly exaggerated by many environmentalists	6	9
Nowadays most of the population behaves irresponsibly towards the environment	85	80
Attitude to nature		
Despite what others are doing, I'm trying as much as possible, treat the environment properly	74	63
Everyone, no matter how difficult, must do more for the environment	81	82

I behave consciously towards environment, when make efforts additionally	19	32

Our data (Figure 1 and Table 2) indicate that the active component in the structure of ecological culture of personality is the least developed in the majority of respondents. Namely, environmentally congruous behavior and reasonable ecological practice as a measure of ecological culture of the majority of students at low (0-11 points) and average (12-20 points) levels (Figure 1). Awareness of the need to participate in environmental activities associated with the strengthening of ecological motives and cognitive activity based on intersubject application of knowledge. One of the pedagogical conditions aimed at improving teaching and professional motivation is to attract students for teaching and research, design and creative tasks that can be thought of as interdisciplinary and aimed at developing the professional and general culture (in this case, environmental) competencies. In accordance with the theory of contextual learning there is a need of consistent modeling in forms of students' activity for future professional activities on the part of its objective and social context (Verbitsky, 1999, 2010). In this paper, we have established dynamics of ecological culture of students of Kazan University during the inclusion in the design and creative work on an interdisciplinary basis. Design and creative activities for the environmentally relevant aspects in the course "Pedagogy" are aimed not only at promoting students' cognitive activity and the development of environmental competencies, but also on the formation of a scientific and critical thinking. This design and creative work allows:

- gain experience of search activity in environmental issues,
- implement an independent work on a given topic in terms of personality-oriented approach,
- obtain skill of collective (group) work on the given theme,
- carry out the correlation of theoretical knowledge and its practical applications (in particular, environmental knowledge and environmentally consistent behavior).

The Institute of Ecology and Geography students in a course of "Pedagogy" have been offered three basic forms of activities to meet the challenges of environmental education. 1. Studying activity included lectures, seminars and round tables on topics "Environmental humane pedagogy. Prospects for the development of environmental education", "Development of environmental social movements abroad (on example of Germany)". 2. Quasi-professional activity was organized as a business game "Youth environmental movements." 3. For involvement in the teaching and profession activity it has been proposed to students as participants of virtual environmental movements, to design and create programs and plans of the greening of urban areas and disposal of waste, which later they presented the expert committee consisting of the teachers. Our results suggest that such design and creative work is done by an average of 50% of students in the departments of Ecology, Nature Management, and 25% of students of the departments of Environmental Geoscience, Meteorology, Physical and Economic Geography, that creates an opportunity for further deepening of environmental knowledge and understanding to develop appropriate beliefs for respective treatment of nature. Table 3 presents the results indicating an increase in the number of students who have a high level of environmental awareness in comparison with initial data (Table 1). Design and creative activity of students of the Faculty of Sociology consisted of a questionnaire development, conducting the survey and analyzing the results. In the first phase of the project future sociologists have developed a questionnaire for express survey for students of Kazan Federal University, which allows determining their relation to the environmental situation on the campus, as well as personal contribution to changing the current environmental situation. Work on the questionnaire has required skills application in subject activity (sociology) and actualization of environmental issues in the educational process. On organizational and technical phase the survey forms were prepared and distributed to locations of interviewers and the time of survey was determined. Further, a survey of 350 respondents was conducted. At the final phase of the project profiles have been processed, the results were analyzed. After retesting of students studying sociology involved in the project, it was determined that 48% of them have a high level of environmental awareness, and 52% - average level (Table 3).

Table 3. Levels of development of ecological culture of students of Kazan University (% of total number of respondents)

Institute/Faculty	Low level	Middle level	High level
Institute of Ecology and Geography	1	31	68
Faculty of Sociology	0	52	48

It can be assumed that the use of design and creativity tasks as one of the modern teaching methods and

simultaneous updating of environmental education tasks in teaching allows improving the environmental culture of the future graduates, and has great importance for future professional activities, successful self-realization. In the analysis of the component composition of ecological culture, it was found that the observed increment was due to adjustments of all its components: environmental education (I), environmental awareness (II) and environmental performance (III) (Figure 2).

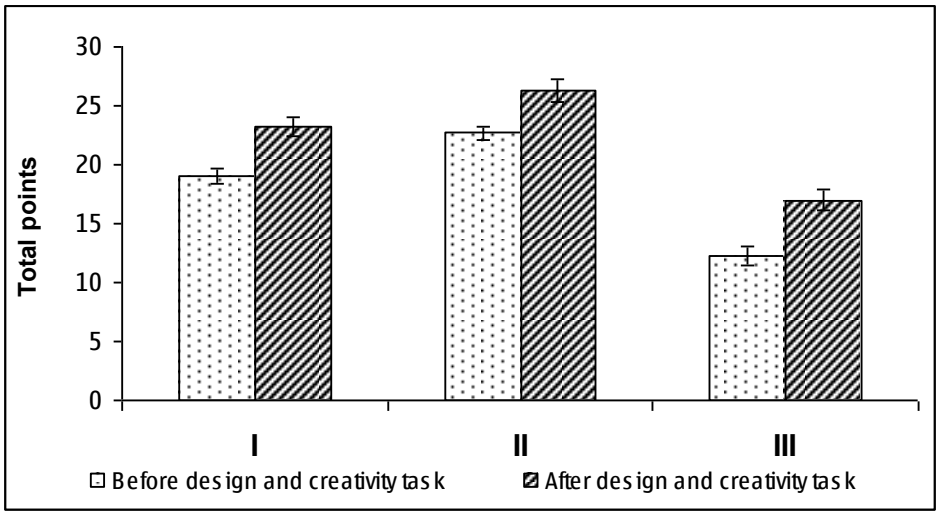

Figure 2. Dynamics of ecological culture of students: I - environmental education, II - environmental consciousness, III - environmental activities.

The results obtained in the course indicate that learning and professional activity in higher education system can contribute to the development of the responsible attitude towards nature and, generally to environmental culture of the students. In university environment with help of design and creativity tasks the conditions for students' involvement in various environmental initiatives can be created that ultimately determines their environmental awareness and promotes environmental culture. Usage of the ecological potential of academic disciplines and the diversity of activities ensures the formation of personal positive attitude to the environment of a future graduate, the sustainability of their social and professional points of view. Therefore, further orientation for solving the problems of environmental education in high school will help to improve the training of young professionals as creative individuals focused on continuous improvement.

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