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ATTITUDES AND BELIEFS OF PRIMARY SCHOOL STUDENTS ACCORDING TO PROBLEMS OF ENVIRONMENTAL PRESERVATION AND PROTECTION

Abstract: Ecological education has a key role in achieving responsible attitude towards nature as well as in promotion of views and conduct with the aim of sustainable development. Apart from TIMSS 2003, the research which determined low level of student achievements in ecological field, in our educational practice there has been no research concerning the influence of education on students' attitudes towards environmental protection and improvement. The research presented in this work represents a part of pedagogical experiment carried out on a sample of 180 seventh grade students who studied the content related to ecology within biology curriculum. The intention of conducted survey was to determine the attitudes and opinions the students have about preservation and protection of the environment. The studied attitudes of interviewed students towards environmental protection and improvement are positive in large percentage, but they lack the knowledge about contaminators from the immediate environment as well as their influence to it. The readiness of students to participate in ecological projects is not high in percentage, and is only oriented to the actions in the immediate surroundings and with the immediate results. Ecological education will be successful only if teachers create the culture of critical thinking and if ecological education is not restricted to formal traditional education. The active role of students in the educational process is necessary for gaining the environmental knowledge, attitudes and habits leading to their pro-ecological behavior.

Key words: environmental education, environmental protection, students' views, primary school.

The intensive development of technologies as well as the growth of the Earth population, during the 20th and the beginning of the 21st centuries, have led to the enlargement of environmental problems, which are increasing and gaining global character. Many issues related to air pollution, water contamination, soil pollution, toxic waste and misuse of pesticides, have been considered from the standpoint of direct threat to human well-being. Today, there are more and more talks about direct human responsibility for nature (de Žarden 2006: 41). Global environmental problems like reduction of available natural resources, pollution and increasing population number are challenges for modern lifestyle.

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The ecological crisis of the present world can be overcome by activating all social structures as well as improving ecological and youth education, where biology curriculum would have significant role in developing the rational attitude towards nature by respecting its laws (Станисављевић и Радоњић 2009: 31).

Education is crucial for promotion of sustainable development and improvement of capability of people to deal with environmental issues as well as the issue of community development. According to Agenda 21 of UNESCO, education for sustainable development requires a new vision of education – the one which could help people better understand the world they live in and to turn to future, knowing that they could play an important role in solving the complex and interdependent problems which endanger our future, such as environmental degradation, collapse of the urban environment, population growth etc. Such vision requires that all parties involved in the educational process – teachers, educators, designers of educational programs, designers of education politics and authors of educational materials – promote the value system as well as the ethics which is, inter alia, susceptible to the use of natural resources. Teacher's role is utterly important, because only creative and interesting teaching could help students develop knowledge, skills, values and attitudes leading to better understanding of the need of environmental preservation (Barazza and Cuaron 2004: 22). For thorough understanding of nature students need theoretical knowledge which would help them adjust rapidly to changes in material sphere. Gaining this knowledge is just one side of what they need to learn and adopt, while the other side is the application of this theoretical knowledge to every-day life while dealing with various issues and problems (Ђорђевић 1997: 191).

On a primary school level education is essential in forming students' environmental awareness. Elementary ecological knowledge, which students gain through curriculum of biology in primary schools, is, by itself, insufficient for development of environmental awareness. Constitutive elements of environmental awareness are, beside ecological knowledge, evaluation of environmental situation and environmental conduct (Недељковић 2002: 21–22). Since environmental teaching contents have an important role in development of responsible attitude towards nature, the significant fact is that some researches have shown the students do not understand basic ecological terms even after being taught /studying them. The reason for that lies in a fact that students' prejudice, habits and attitudes towards the environment, which greatly affect studying, are not considered in the process of creating curricula and teaching materials (Sander et al. 2006: 119).

Long teaching practice has pointed out that primary school students have some difficulties adopting ecology curriculum in elementary schools in Serbia, primarily the part related to characteristics of different ecosystems and their protection. In International research of students' achievements in the field of ecology, TIMSS 2003, in the cognitive area of analysis and reasoning, our students

showed lower success than the world average (Шевкушић и др 2005: 138–161). The explanation for these results maybe lies in the fact that there is a disbalance between the planned goals of ecological teaching program and the actual teaching process, the gap between rhetoric and reality. The causes of the present disbalance, which were researched among primary school teachers, are listed as the lack of time, resources, knowledge and skills.

THE AIM OF RESEARCH

Summing the aforementioned problems in practice, the significance of ecological education as well as the lack of research related to students' attitudes about ecological education and environmental protection, this paper presents the research whose aim includes establishing attitudes, beliefs and opinions of seventh grade students, related to problems of environmental protection and preservation. This research is a part of the pedagogical experiment by which it has been determined that the rate of efficiency of a field work, in teaching ecology, upon the quality and retention of students' knowledge, is high.

RESEARCH METHODOLOGY

The sample included 180 seventh grade students, 87 girls and 93 boys, from three primary schools on the territory of Kragujevac: "Sveti Sava", "Dragiša Mihajlović" and "Natalija Nana Nedeljković". The research was conducted in May 2009.

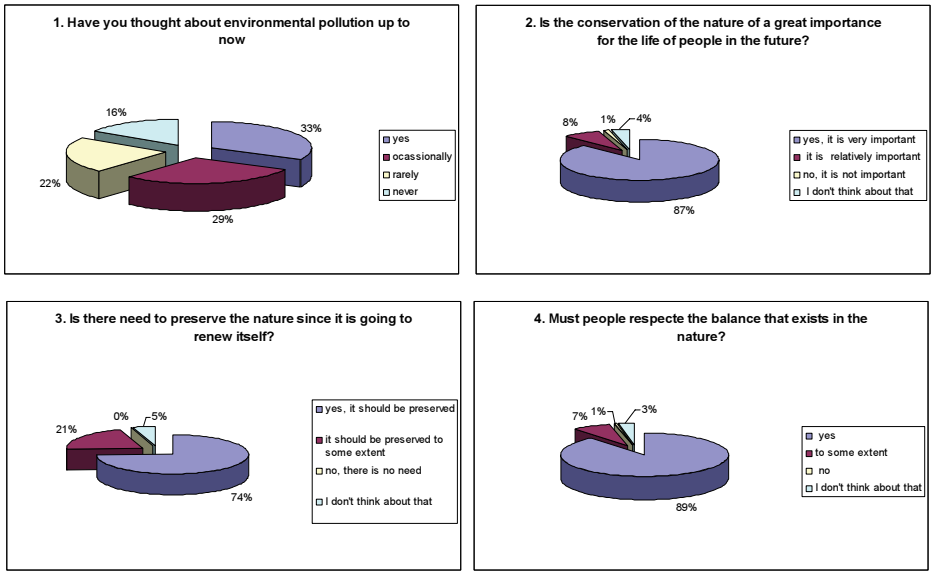
Survey was conducted anonymously, immediately before the completion of biology teaching program through which students got acquainted with ecological terms, the types of ecosystems, living world of these ecosystems, as well as the human impact on the environment.

The survey list (Attachment No. 1) included 14 questions: 12 questions made by a modified scale of Likert type, where the students could specify the degree of agreement or disagreement with the proposed statement; one was a multiple choice question, whereas one question was of open type upon which very few students replied. The survey gave insight into attitudes, beliefs and opinions of students about human impact on the environment, into degree of their awareness of ecological state of their immediate environment, into their readiness to join the school ecological projects, as well as their interest in gaining the environmental information through available media.

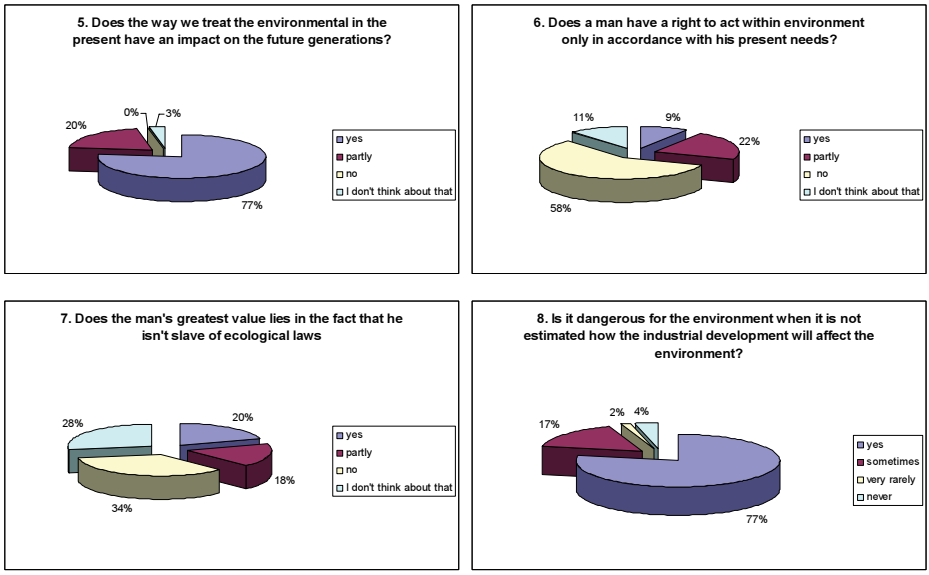
Survey results were processed by descriptive analysis of percentage of student answers.

RESEARCH RESULTS AND DISCUSSION

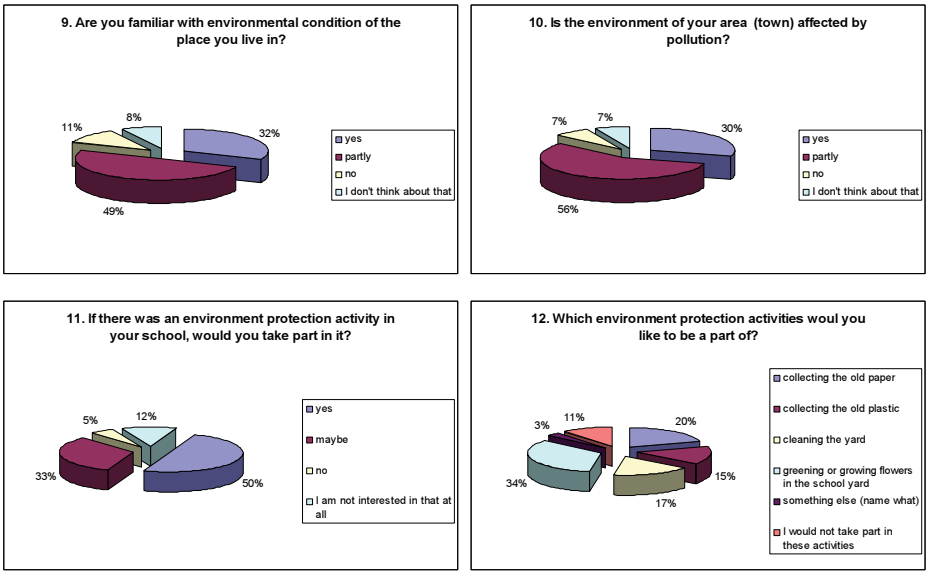
Results of Survey 1, shown in pictures 1-a, b, c and d, present the percentage of student answers to the questions.



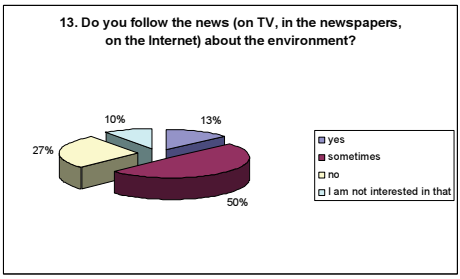
Picture 01-a



Picture 01-b



Picture 01-c



Picture 01-d

The question "Have you thought about environmental pollution up to now?" was answered positively by 33% of the questioned students, while 29% answered that they consider this problem only occasionally. The percentage of students who answered that they consider the problem of environmental pollution rarely or never is relatively high – 38%. These results are in favour of research of Kaiser et al. (1999: 12–15) who claim that factual knowledge about environment presents the precondition for a person's attitude towards it, as of research results of TIMSS (2005: 138–148) about low level of student achievements in ecological field.

Students showed, according to the results, high awareness of nature protection – 87% of students consider it of great importance for future life, 8% find it relatively important, whereas only 1% consider nature preservation as unimportant for life in the future. Environmental education, as part of compulsory

biology curriculum in primary schools, helps students develop the knowledge which enable them to participate in ecological discussions and to provide, as in this case, expected or desirable answers.

Among the interviewees there were not those considering that the nature shouldn't be preserved, while only 5% have never thought about it. In high percentage students agreed with offered statements and answers related to relationship between man and nature as well as to keeping ecological balance. Even 89% of students find keeping natural balance important, and 74% consider that the nature should be preserved despite its natural renewal process. Such a high percentage of positive attitudes towards preserving the nature laws, points out that the seven grade biology curriculum is properly structured and adjusted to the intellectual age of students. Students who stated that natural balance shouldn't be kept (1%) or that they never think about it (3%), are in minority, and this attitude could be explained due to negative attitude towards school teaching in general.

Environmental message that is often heard – "We live on a borrowed planet" – had impact on students' attitudes. Therefore, 77% of questioned students think that our impact on the environment will influence future generations, 20% think the influence will be partial, while 4% think that there will be no influence, or they never think about aforementioned problem.

During their research of students' attitudes related to environment and preservation of ecological balance, Humston and Ortiz-Barney (2007: 10) defined the ecocentrism of students as demonstration of high environmental awareness, and anthropocentrism as demonstration of negative attitudes towards environment. The attitudes of students answering the question –"Does a man have a right to act within environment only in accordance with his present needs?" – could be analyzed in a similar way. High percentage of environmental awareness – ecocentrism, was recognized within 57% of questioned students, who answered with "No" on the aforementioned question, while those whose answers were affirmative (13%) or partially affirmative (22%) showed non-ecological attitudes and orientation towards personal benefit with no regards to consequences. The answers to similar question, related to the position of man in relation to preservation of nature, can also be characterized as strongly anthropocentric in their attitudes, where even 37% of questioned students agree, and only 18% disagree, with the statement that the greatest human value is not being a slave of environmental laws.

Survey results point out that the students are, to a great extent, aware of the harmful effect of industrial plants, since they showed a high level of compliance with the statement pointing out the danger of industrial development without previous evaluation of its environmental impact. Even 81% agree with this statement, while 15% consider it as partially dangerous. Some students, 4% of the total, do not find it harmful for the environment to develop industry without evaluation of its impact on it, which could be explained by the lack of their insight into causal relations between human activities and state of the environment.

Despite the existing awareness of harmful effect of industrial plants on the environment, the greatest number of interviewed students have partial or insufficient knowledge of environmental state and vulnerability of their immediate surroundings. Only 32% of interviewees know what kind the state of their immediate environment is, while 30% is aware that it is threatened by pollution. Since there are industrial plants in the neighborhoods where the schools are, as well as developed traffic network, these answers show both very poor knowledge of environmental state of their immediate surroundings, and non-recognition of adverse effects of human activities on the environment. These results point out the necessity for connecting the teaching material to examples from the immediate surroundings, rather than presenting them in general.

Survey results point out that positive attitudes towards environment result, to a great extent, in positive ecological behavior, wherefore the factual knowledge about the environment becomes significant moderator between environmental attitudes and ecological behavior (Meinhold and Malkus, 2005: 511–532). However, it has not been proved that attitudes towards environment present useful indicator of future behavior, considering that useful indicators are defined as a constant predicting of future behavior (Hinni et al 1995: 22–31). Despite the survey results, showing high level of awareness of the necessity for preserving nature, only 50% of the inreviewees would join the environmental projects, 33% would join the projects occasionally, 12% only if they had to, while 5% would never join such projects. These results indicate that the development of pro-ecological behavior could not be restricted only to gaining factual knowledge in schools, but it has to be considered from different aspects: sociological, psychological, economical, political, etc.

The students would most willingly join the planting campaigns in their school yards – 34%, 20% of them would collect old paper, 17% would take part in cleaning actions of the school yard and the neighborhood, 15% would collect plastic, whereas 11% would not take part in any activity of the kind. These results point out that the students are mostly interested in the activities with immediately noticeable results, as well as in those which help improving the aesthetics of the school and neighborhood, therefore future ecological activities should be planned accordingly. Similarly, the research of Peacock (2006: 15–22) points out that the students' attitudes and beliefs related to the environment refer mostly to local surroundings, and that they rarely think globally. Although the majority of students, after completion of ecological education, change their attitudes and beliefs related to the issues such as recycling and garbage disposal, their attitudes towards environmental protection develop only as a wish to protect local surroundings.

The students' ignorance of environmental state of their own surroundings could be connected to the insufficiency of information and lack of interest for the news related to the environmental state. Only 13% of questioned students learn the news related to the environmental state, through available media, 50% only occasionally, while 37% do not have interests of the kind. Considering that

television shows and articles on environmental issues are rare in our media, except when the ecological incidents are the case, these students' attitudes represent the alarming indicator and they point out the necessity for greater presence of environmental issues in all media as well as for the inclusion of local ecological issues and problems into teaching materials.

Survey results point out the fact that teaching programs greatly face the need for checking their efficiency in practice, since education is considered to be the key element for improvement of pro-ecological behavior. In the research of Bogner (2003: 1), test results of students' attitudes related to: nature protection, use of natural resources, set of beliefs about nature as beliefs in themselves, managing and preserving the nature by keeping the ecological balance, the investments into preservation of ecosystems and non-destructive ecological way of life considering the restricted resources of planet Earth –showed, with no exception, that under the educational influence, the attitudes of all the students changed to a great extent. Developed attitudes towards the environment include connecting the short-term / present behavior to the long-term / pro-ecological one, in the process of environmental preservation and protection. However, attitudes towards the environment also include different interests (personal, social, economical, etc.) and referring objects. Leeming et al. (1993, according to Manzanal et al. 1999: 450) conclude that it isn't clearly defined which attitudes should be taken as the most significant, and that there isn't a consensus among different programs, school or non-school, whose aim is to develop and evaluate attitudes towards the environment. Even though, according to the research of Kaiser et. al (1999: 1), ecological attitudes present powerful predictor of ecological behavior, there has been a lack of single concept of desirable ecological attitudes. Also, a great amount of research (Kaiser 1999., Barraza at all 2003, Barrett 2006.) point out that, on a general level, there is no measurable match of ecological attitudes and ecological behavior.

Ecological behavior can be considered from two aspects. The first aspect is the intention that the student/individual behaves ecologically in every situation, while the second aspect is student's behavior when he is beyond the control of institutions and other people. One of the important assignments of ecological education in our country is to promote, through teaching programs and methods, pro-ecological behavior out of the institutions and control, according to the principles of sustainable development.

CONCLUSIONS

One of the existential challenges for citizens in 21st century is keeping the abilities in harmonious coexistence with surroundings. Students who understand their surroundings and who have acquired abilities for appropriate thinking, will be able to assess and evaluate changes happening in it, and, as a result, they will acquire behavior based on environmental laws.

Survey results show the existence of ecological awareness with students, so as the understanding of principles of environmental laws, and taking active role in actions of environmental preservation and protection.

Students must be encouraged to take an active role in organizing ecological campaigns through cooperation with school, local authorities and civil organizations. Even though the aim of reformed school is to increase students' activities in teaching and non-teaching processes, in reality, in many schools, students still have the passive role of an observer or receiver of knowledge and thinking of others. Critical ecological education, which develops skills, knowledge and values, promote behavior with the aim of sustainable development, and is not restricted only to formal education, represents the challenge to our school system and traditional ways of teaching and studying. The success of ecological education will be determined by teachers' ability to create culture of critical teaching and studying.

Many teachers studied and were professionally trained long before the interdisciplinary courses of environmental protection were developed. The research points out that the lack of professional preparation of future teachers for teaching materials related to environmental protection, is one of the reasons for not including the education "for" environmental protection into everyday teaching practice. Certain teachers' attitudes towards the environment would be improved through development of professional courses for teachers interested in education about environmental protection. Thus, the quality of education "about" the environment could be improved, which would help rising the level of education "for" the environment with the aim of promoting readiness and capability for adopting a lifestyle that is in accordance with wise use of natural resources.

While creating teaching curricula related to ecology, it should be taken into consideration that students forget most of the learned facts, whereas the acquired habits and attitudes last longer. Therefore, in ecological education the focus should be not only on acquiring the facts but on developing habits of pro-ecological behavior. According to that, the transition from modern teaching to the one promoting students' active role in gaining ecological knowledge, attitudes and habits, is necessary. Since the students' knowledge about human impact on the environment is growing and their attitudes changing, they – future citizens, will have the opportunity to analyze carefully and wisely new situations in order to make decisions that will improve life on our planet. This task requires the work of individuals as well as the effort of the community to activate entire society with the aim of achieving sustainable development.

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СТАВОВИ И МИШЉЕЊА УЧЕНИКА ОСНОВНЕ ШКОЛЕ У ОДНОСУ НА ПРОБЛЕМЕ ЗАШТИТЕ И ОЧУВАЊА ЖИВОТНЕ СРЕДИНЕ

Резиме: Еколошко образовање је кључно за изградњу одговорног односа према природи и промоцију ставова и понашања у циљу одрживог развоја. Визија одрживог развоја захтева од свих укључених у образовање – творaца образовних програма, креатора политике образовања, наставника и аутора наставних материјала – да промовишу систем вредности и етику која је осетљива на одговарајуће коришћење природних ресурса. На основношколском узрасту образовање има пресудан утицај на формирање еколошке свести и ставова код ученика.

Поред ТИМСС 2003 истраживања којим је утврђен низак ниво ученичких постигнућа из области екологије, у нашој образовној пракси није било истраживања која се баве утицајем образовања на ставове ученика према заштити и унапређењу животне средине. Истраживање представљено у раду је део педагошког експеримента примењеног на узорку од од 180 ученика 7. разреда који су, у оквиру наставног програма биологије, учили еколошке садржаје. Спроведено анкетирање је имало за циљ утврђивање ставова и мишљења које ученици имају према заштити и очувању животне средине.

Истражени ставови анкетираних ученика према заштити и унапређењу животне средине су у великом проценту позитивни, али недостаје познавање загађивача из непосредног окружења у коме ученици живе и њиховог утицаја на животну средину. Одређен проценат ученика је показао нееколошке „антропоцентричне" ставове према коришћењу природних ресурса и окренутост ка личној користи без обзира на последице. Спремност ученика за учешће у еколошким акцијама процентуално није велика и односи се само на акције које су у блиском окружењу и које дају одмах видљиве резултате. Интересовање за информације о стању животне средине постоји код малог процента анкетираних ученика и може бити у вези са изостанком разматрања локалних еколошких ситуација у наставном градиву.

Еколошко образовање биће успешно уколико наставници створе културу критичког мишљења и уколико се еколошко образовање не ограничи на формално традиционално образовање. Активна улога ученика у наставном процесу је неопходна за стицање еколошких знања, ставова и навика које води ка њиховом проеколошком понашању.

Кључне речи: еколошко образовање, заштита животне средине, ставови ученика, основна школа.

Survey / Questionnaire

Questions	**Possible answers**
1. Have you ever thought about the pollution of the environment?	a) yes b) ocassionally c) rarely d) never
2. Is the conservation of the nature of a great importance for the life of people in the future?	a) yes, it is very important b) it is important to some extent c) no, it is not important d) I don't think about that
3. Is there a need to preserve the nature since it is going to renew itself?	a) yes, it should be preserved b) it should be preserved to some extent c) no, there is no need d) I don't think about that
4. Must people respect the balance that exists in the nature?	a) yes b) to some extent c) no d) I don't think about that
5. Does the way we treat the environment in the present have an impact on the future generations?	a) yes b) partly c) no d) I don't think about that
6. Does a man have a right to treat the nature according to his momentary needs?	a) yes b) partly c) no d) I don't think about that
7. Does the man's greatest value lies in the fact that he isn't the slave of ecological laws?	a) yes b) partly c) no d) I don't think about that
8. Is it dangerous for the environment when it is not estimated how the industrial development will affect the environment?	a) yes b) sometimes c) very rarely d) never
9. Are you familiar with the environmental condition of the place you live in?	a) yes b) partly c) no d) I don't think about that
10. Is the environment of your area (town) affected by pollution?	a) yes b) partly c) no d) I don't think about that
11. If there was an environment protection activity in your school, would you take part in it?	a) yes b) maybe c) no d) I am not interested in that at all

Questions	**Possible answers**
12. Which environment protection activities would you like to be a part of? (you can circle more than one answer)	a) collecting the old paper b) collecting the old plastic c) cleaning the yard d) greening or growing flowers in the school yard e) something else (name what) _____ a) I would not take part in these activities
13. Do you follow the news (on TV, in the newspapers, on the Internet) about the environment?	a) yes b) sometimes c) no d) I am not interested in that
14. Is there anything related to the pollution and preservation of the environment that you would like to say but you weren't asked?	