# UNIVERSITY STUDENTS' INFORMATION SOURCES OF EDUCATION FOR SUSTAINABLE DEVELOPMENT ISSUES AND THEIR PERCEPTIONS OF ENVIRONMENTAL PROBLEMS

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## Abstract

*Mass media consumption has expanded from traditional mass media – television broadcasting, newspapers, radio - into new media, such as the Internet. Information about environmental issues such as global warming, water and air pollution and other environmental problems, comes mainly from the media. In Finland nowadays the Internet is generally the most important source of news for young people. The media has also been used in a variety of ways relating to education for sustainable development. In the survey, education for sustainable development, students' opinions were asked on 73 items concerning different dimensions of education for sustainable development. This study focuses on two of these items: how university students from different disciplines get information about education for sustainable development issues and which environmental problems they perceive as being the most important. It was found that although students get information about education for sustainable development issues mainly from television and newspapers almost an equal amount comes from the Internet, and lectures are the fourth source of information. Students perceived climate change and the lack of clean water as being the most important environmental problems, the second was the decrease in biodiversity and the least important, malaria. Those students whose information source was mainly television did not perceive biodiversity as being that important environmental problem.*
**Key words:** *education for sustainable development, environmental problems, environmental information sources*.

## Introduction

*Education for Sustainable Development*

The idea of Education for Sustainable Development (ESD) has been used since the end of the 20th century together to meet concern about environmental education. ESD allows learners to acquire the skills, capacities, values and knowledge required to ensure sustainable development. It is education at all levels and in all social contexts; family, school, workplace and community. It fosters responsible citizens and promotes democracy by allowing individuals and communities to enjoy their rights and fulfill their responsibilities. Further, it is education for life-long learning and fosters the balanced development of the individual. (UNESCO, 2005) ESD replaces problem orientation which is associated with environmental education (EE) and shifts the focus to the inclusion of social issues and economic development (see e.g. Kopnina, 2011). According to Hesselink, van Kempen and Wals (2000), the relationship between EE

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and ESD can be understood in several ways: EE is part of ESD, ESD is a part of EE, EE and ESD partially overlap, or ESD is a stage in the evolution of EE. The EE/ESD pedagogies often overlap in environmental education literature, including student-centered, minds on and hands-on learning, as well as active participation (Eilam and Trop, 2010). EE/ESD comprises of several models which in general consist of three or four dimensions. For example, Palmer (1998) highlights education about, in and for the environment. In models which are based on the ideas of Hungerford and Volk (1990), environmental education most often consists of four dimensions: sensitivity, knowledge, action, and participation (Jeronen, Jeronen & Raustia, 2009; Käpylä, 1995). The final phase of environmental education is towards participation in society and in its broadest sense, participation at the global level.

*Education for Sustainable Development Issues in Higher Education*

ESD issues have, to some extent, been studied at the higher education level. According to Reid and Petocz (2006), many university teachers in varying disciplines show an awareness of sustainability playing some role in their teaching, but some of them view from a limiting perspective. While limiting conceptions of teaching result in limiting approaches to sustainability, expansive or holistic conceptions lead to a broader approach to the issue. For the majority of the teachers, sustainability and teaching were separate entities; also the language associated with sustainability, for example EE, SD, ESD, did not belong to the vocabulary of most academics' (Reid & Petocz, 2006). Elshof (2005) reported that teachers of technology considered sustainability issues which related to social justice and equity to be less important. On the personal level, teachers considered population growth, human rights, international trade and pollution to be the most significant components of sustainable development, while biodiversity, international trade, unjustified economic subsides and global warming, were the least important. Salīte, Mičule, Kravale, Iliško, and Stakle (2007) found that teacher students consider environmental problems, pollution, the use of resources and disasters to be important, as well as other problems indirectly related to this aspect. In this same study, environmental pollution was viewed by the students as toxic pollution (gas, oil, and chemical escapes), nature pollution, shortage of dumping sites and an increase in the number of factories. The types of pollution identified were mostly related to peoples's activity and animal waste while in the characterization of environmental pollution, the effects of climate changes (depletion of ozonosphere) and rise of temperature were also a cause for concern. Problems related to the use of natural resources and disasters were named less frequently than pollution problems.

Svetina, Istenič-Starčič, Juvančič, Novljan, Šubic-Kovač, and Zupančič (2011) have assessed younger college students´ understanding of sustainability. They found that students in urban settings had higher sustainability scores than those in non-urban settings. Sustainability issues became more interesting with increasing age particularly in adolescents living in urban settings and it was also noted that girls tended to express a higher degree of appreciation toward sustainable solutions than boys.

Oztas and Kalipci (2009) revealed in their study that teacher candidates considered global warming to be main issue concerning environmental problems the second being climate change; other important issues were demographic effects, greenhouse effects, shanty housing and urban sprawl. A considerable number of teacher students were aware of the main environmental pollutants and their risk factors: deforestations, diminishing drinking water sources, water pollution, soil pollution, air pollution and acid rains. Teacher candidates were less aware of decreasing of biodiversity and noise pollution. According to Oztas and Kalipci (2009) the major source for information on environmental education was radio and television (40%). Scientific books and journals were not seen as providing useful resources for environmental education.

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### *Media as a Source of Environmental Issues*

There has been a significant expansion in consumption from the traditional mass media – television broadcasting, newspapers, radio - into the consumption of new media such as the Internet and mobile phone communications. These signal changes in how people access and interact with information (Boykoff, 2009). Nowadays, Finns follow news mainly via four media: television, printed newspapers, radio, and the Internet. In 2010, the role of the Internet generally increased at the same phase as in previous years. According to the latest report on the use of communication services in Finland (FICORA 2011), the Internet is the most important source of news for young people. Although television still has a strong traditional standing in Finland, still being the most important way for all age groups (15 to 65) to follow its audiovisual content, the 20-24 years olds use television less than others. Internet, instead of television, is the most important device for the men under 25, concerning both programs on the whole as well as videoclips. Online viewing is particularly popular among members of the youngest age groups; for Finns under 35, Internet is the most followed news channel, but for those over 35 television news is the most popular.

Much of what most people hear about issues such as global warming, decreasing biodiversity, lack of clean water, erosion, desertification, over-grazing, malaria and environmental threats, is likely to come from the media (Shanahan, Morgan, & Stenbjerre, 1997; Asunta, 2003; Lee, 2008; Boykoff, 2009). According to Asunta (2003), the main environmental information sources of 12 to 15 year-old pupils in Finland, were television and radio; next in priority were the science teacher, newspapers and magazines, parents, other pupils, and the Internet and after these sources came movies, friends, conservation organization, Greenpeace or WWF and municipalities and consumer organizations.

Lee (2008) also states that although, television was college students' major source of information on environmental news related to local, national and global environmental problems the second was the Internet. Daily newspapers and governmental sources were those least used. Lacy, Riffe, and Varouhakis (2007) state that different media are used as an information source at different geographic levels and conclude that many people use two or more sources to find environmental news. Growth of the Internet may well be reshaping patterns of media use. The more local the geographic emphasis is of the news, the greater the number of people who do not access any environmental information and less diverse is the access of those who do. The Internet was often used in conjunction with other media, and most often used was the television news and newspapers. At the global level, respondents who used the Internet were most likely to use television news as an additional environmental news source. (see Lacy et al., 2007)

Later on, Riffe and Reimold (2008) especially refer to young people and the internet´s increasing potential for them as an environmental news source both on a national and international scale. Internet was frequently cited as the most useful environmental news source for the youngest respondents (18-24 year-olds). However, based on their study, even in the Internet age, they also agree about the significance of newspapers for delivering more localized environmental news and information. Television was still the primary news source for young people. Conversely, Oztas and Kalipci (2009) report that radio and television, news-magazines, Internet, scientific books, and lectures, in this order were teacher candidates' major source about environmental risk factors.

Watching documentary films enhances students' environmental sensitivity (Bahk, 2010; Barbas, Paraskevopoulos, & Stamou, 2009). Barbas et al. (2009) conclude that in the development of environmental knowledge and feelings the non-verbal, less conventional documentary is more effective, but in the change in attitudes and beliefs, the verbal, 'traditional' one is equally effective. According to Shanahan, Morgan and Stenbjerre (1997) there is essentially no bivariate relationship between television viewing and the perception of specific threats to the environment

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such as industrial air pollution or the greenhouse effect. A theoretically coherent view would be that television messages do specifically cultivate environmental fear; television in general uses fear, doomsaying, and sensationalism to generate attention. Maybe the best known film concerning environmental issues is "An Inconvenient Truth" and several countries have even proposed using the film as an educational tool in school classrooms (Nolan, 2010). Watching this film increases knowledge about the causes of global warming, concern for the environment and willingness to reduce greenhouse gases. However willingness to take action immediately after watching the movie does not necessary result in action later on (Nolan, 2010).

In this study, university students' perceptions on environmental problems and their information sources on environmental issues will be clarified. The study focuses on the research questions:

- Which issues do university students perceive as being the most important environmental problems?
- Which information sources do university students use when seeking knowledge on education for sustainable development?
- What kind of relationship is there between information sources and perceived environmental problems?

## Methodology of Research

### *General Background of Research*

This study is a quantitative survey. The participants in the study comprised of five hundred and twenty three (n=523) university students from one quite typical university. The data was collected through a questionnaire which consisted of five parts and included a total of 73 items. Demographic information was asked in the beginning of the questionnaire namely: gender, age, how many years of study, the students´ major and minor subjects and where the participants came from.

### *Sample of Research*

The students were from different faculties and majored in different subjects (Table 1). There were 73% female students and 27% male students, 10 students did not mark the gender. Table 2 presents the participants' study year.

**Table 1. Participants of the study and their major subject (N/%) (Due to missing data n=513).**

| Major subject | Gender | | |
|---|---|---|---|
| | Male | Female | Total |
| Arts, Social Sciences | 23/27 | 61/73 | 84/16 |
| Education | 72/22 | 249/78 | 321/63 |
| Mathematics, Sciences | 42/39 | 66/61 | 108/21 |
| Total | 137/27 | 376/73 | 513/100 |

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**Table 2. Participants' study years (N/%).**

| Major subject | Study year | | | |
|---|---|---|---|---|
| | 1st year | 2nd year | 3rd year | 4th or more years |
| Arts, Social Sciences | 41/49 | 9/11 | 7/8 | 27/32 |
| Education | 185/57 | 51/16 | 74/23 | 15/5 |
| Mathematics, Sciences | 75/69 | 16/15 | 5/5 | 13/12 |
| Total | 301/58 | 76/15 | 86/17 | 55/11 |

*Instrument and Procedures*

The questionnaire was developed based on the four dimensions of ESD. In this article the findings related to two of the questions are reported. Firstly, it was asked from where information about education for sustainable development has been obtained? The alternatives given were television, lectures, friends, magazines, newspapers and the Internet and the possibility to write some other source was also given. Secondly, it was asked what is the most serious global environmental problem. Students were required to rank the following problems in order so that the most important is number 1, the second important 2 and so on. The environmental problems given were a decrease in biodiversity, desertification, climate change, lack of clean water, erosion, over grading and malaria as well as the possibility to add some other environmental problem. Data collection took place in 2009-2011. It took 15 to 30 minutes for students to fill in a paper version of the questionnaire and they worked independently.

*Data Analysis*

Here the analysis is focused on ranking of the most important environmental problem and naming the information sources which university students used. Due to the nature of the variables descriptive statistics, frequencies, cross tabulation and the chi-square test of differences were used, also association between some dichotomous variables was analysed with phi correlation.

## Results of Research

The university students perceived climate change as being the most serious environmental problem, 45% of the students perceived it as being the most serious (Table 3). The second most serious environmental problem was the lack of clean water (34%) and in third place the decrease in biodiversity (15%). 31% of the students perceived the decrease in biodiversity as being the second serious environmental problem while desertification was mainly considered as the fourthly most serious. Over grazing was mainly considered to be a less serious environmental problem and malaria was not seen as a serious environmental problem at all, 81% of the students ranking it in fifth place or considering it to be less serious.

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**Table 3. Environmental problems as perceived by university students in the order from the most serious (N/%).**

| Environmental problem | 1st most serious | 2. | 3. | 4. | 5th or less serious | Mean |
|---|---|---|---|---|---|---|
| Climate change | 234/45 | 140/27 | 80/15 | 33/6 | 36/7 | 2.1 |
| Lack of clean water | 177/34 | 142/27 | 112/21 | 41/8 | 51/10 | 2.4 |
| Decrease in biodiversity | 77/15 | 161/31 | 151/29 | 67/13 | 67/13 | 2.8 |
| Desertification | 7/1 | 27/5 | 71/14 | 138/26 | 280/54 | 4.6 |
| Erosion | 3/0.6 | 12/2 | 46/9 | 115/22 | 347/66 | 5.0 |
| Over-grazing | 1/0.2 | 11/2 | 23/4 | 68/13 | 420/80 | 5.6 |
| Malaria | 2/0.4 | 19/4 | 28/5 | 53/10 | 421/81 | 6.0 |

Students' sources of information concerning education for sustainable development issues, are shown in Table 4. University students selected television and newspapers (67%) as the most frequent sources of information on issues concerning education for sustainable development although, they also selected the Internet (60%) nearly as often as television and newspapers. Lectures were also selected as important sources for information about education for sustainable development (51%). It has to be noted that 479 out of 523 students answered the question concerning the information sources, probably due to the fact that the question was in the last part of the four-sided questionnaire. The students had the possibility to select as many information sources as they wanted.

**Table 4. Sources of information on issues concerning education for sustainable development.**

| Source | Count | Percent of Cases (N=479) |
|---|---|---|
| Television | 322 | 67 |
| Newspapers | 322 | 67 |
| Internet | 289 | 60 |
| Lectures | 246 | 51 |
| Magazines | 190 | 40 |
| Friends | 155 | 32 |

Students who selected getting information about education for sustainable development from friends, also selected magazines as an important source for information on the issue ($r = 0.31$, $p < 0.001$) and they also selected Internet ($r = 0.25$, $p < 0.001$) as an information source to some extent. Students who selected television as an important information source, selected also newspapers ($r = 0.34$, $p < 0.001$) to be an important information source but also Internet ($r = 0.30$, $p < 0.001$). Lectures as an information source could not be associated together with any other information source other than loosely with friends ($r = 0.14$, $p = 0.002$) as information source.

Decreasing biodiversity was most often ranked as a second or third most serious environmental problem. Cross tabulation of biodiversity's seriousness with television as the information source among those students who selected lectures as a source of information as well is shown in Table 5. Those students, who did not select lectures as their information source for environmental issues, but selected 'yes' to television, rank biodiversity as a less important environmental problem e.g. biodiversity second most serious: 'yes' to television 27% , 'no'

to television 40%, the difference between rankings is statistically significant ($\chi^2$=12.43, df=4, p=0.014). For students who selected lectures as an information source, there is no such difference. When ranking the decreasing biodiversity as a serious environmental problem, the same effect is not found between lectures and the Internet nor between lectures and newspapers.

**Table 5. The seriousness ranked by students of decreasing biodiversity as an environmental problem cross tabulated with television as information source among groups who mention lectures or do not.**

| Lectures and seriousness of decreasing biodiversity problem | | | | Television | | Total |
|---|---|---|---|---|---|---|
| | | | | No | Yes | |
| No | Biodiversity (when No lectures, then difference ) | 1st most serious | Count (%) | 16 (15) | 14 (8) | 30(11) |
| | | | Adjusted Residual | 1.7 | -1.7 | |
| | | 2. | Count (%) | **43 (40)** | 46(27) | 89(32) |
| | | | Adjusted Residual | **2.2** | -2.2 | |
| | | 3. | Count (%) | 22(20) | **61(36)** | 83 (30) |
| | | | Adjusted Residual | -2.8 | **2.8** | |
| | | 4. | Count (%) | 11(10) | 25(15) | 36(13) |
| | | | Adjusted Residual | -1.1 | 1.1 | |
| | | 5th or less serious | Count (%) | 16(15) | 23(14) | 39(14) |
| | | | Adjusted Residual | 0.3 | -0.3 | |
| | Total | | Count | 108 | 169 | 277 |
| Yes | Biodiversity | 1st most serious | Count (%) | 17(18) | 29(19) | 46(19) |
| | | 2. | Count (%) | 29(32) | 43(28) | 72 (29) |
| | | 3. | Count (%) | 25(27) | 43(28) | 68(28) |
| | | 4. | Count (%) | 9(10) | 22(14) | 31(13) |
| | | 5th or less serious | Count (%) | 12(13) | 16(10) | 28(11) |
| | Total | | Count | 92 | 153 | 245 |

When taking gender into account, we found that female students rank climate change as the most serious environmental problem more often than the male students (Table 6). 49% of the female students and 34% of the male students ranked climate change as the most serious environmental problem; the difference between rankings is statistically significant ($\chi^2$=15.35, df=4, p=0.004). 37% of men ranked the lack of clean water as the most serious environmental problem.

**Table 6. Difference between gender concerning the seriousness of climate change as an environmental problem.**

| Gender | | Climate change | | | | | Total |
|---|---|---|---|---|---|---|---|
| | | 1st the most serious | 2 | 3 | 4 | 5th or less serious | |
| Male | Count | **47** | 36 | 28 | 13 | 14 | 138 |
| | Percent | **34** | 26 | 20 | 9 | 10 | 100 |
| | Adjusted Residual | **-3.0** | -0.3 | 1.9 | 1.7 | 2.2 | |
| Female | Count | **184** | 104 | 51 | 20 | 18 | 377 |
| | Percent | **49** | 28 | 14 | 5 | 5 | 100 |
| | Adjusted Residual | **3.0** | 0.3 | -1.9 | -1.7 | -2.2 | |
| Total | Count | 231 | 140 | 79 | 33 | 32 | 515 |
| | Percent | 45 | 27 | 15 | 6 | 6 | 100 |

When comparing students' rankings about the seriousness of environmental problems, it was found that, even gender controlled, educational science students more often than other students ranked the lack of clean water as the most serious environmental problem ($\chi^2$=16.86, df=8, p=0.032, Table 7).

**Table 7. The seriousness of the lack of clean water as ranked by students in different disciplines.**

| Major subject | | Lack of clean water | | | | | Total |
|---|---|---|---|---|---|---|---|
| | | 1st the most serious | 2 | 3 | 4 | 5th or less serious | |
| Arts, Social sciences | Count | 21 | 24 | 23 | 11 | 6 | 85 |
| | Percent | 25 | 28 | 27 | 13 | 7 | 100 |
| | Adjusted Residual | -1.9 | 0.3 | 1.4 | 1.9 | -0.9 | |
| Education | Count | **125** | 84 | 68 | 20 | 28 | 325 |
| | Percent | **38** | 26 | 21 | 6 | 9 | 100 |
| | Adjusted Residual | **2.9** | -0.8 | -0.3 | -1.9 | -1.2 | |
| Mathematics, Sciences | Count | 30 | 33 | 20 | 10 | 17 | 110 |
| | Percent | 27 | 30 | 18 | 9 | 15 | 100 |
| | Adjusted Residual | -1.6 | 0.8 | -0.9 | 0.5 | 2.2 | |
| Total | Count | 176 | 141 | 111 | 41 | 51 | 520 |
| | Percent | 34 | 27 | 21 | 8 | 10 | 100 |

Students were also asked if they think that they really understand what is the meaning of 'education for sustainable development'. 85% of the students responded that they did. Thus, it is assumed that the students were capable of responding to the question 'from where do you get information about education for sustainable development'. The relationship between EE and ESD was also asked. 60% of the students were of the opinion that ESD was the same as EE, and 40 % thought it was not.

## Discussion

According to the university students, in their opinion climate change is the most serious environmental problem, second is the decreasing biodiversity and third the lack of clean water. This finding partly disagrees with that of Elshof (2005) in which technology teachers perceived biodiversity and global warming as being the least important sustainability issue. Teacher students in the study of Salïte et al. (2007), also considered the serious effects of climate changes, but other issues were held to be more serious problems, among them pollution in particular. The difference between the results in these studies is probably due to the methods used in the research. In this study, only global issues were given to the students whereas in the other previous studies pollution is often viewed from the local viewpoint. Other reasons for the differences in results might be due to cultural differences and the actual state of the environment in the countries where these studies have been carried out. The findings in this study concerning perceived environmental problems are similar however, to those found by Oztas and Kalipci (2009). In their study teacher candidates' considered the most important issue in environmental problems as being global warming, while the second was climate change; even though in this Turkish case the culture and state of the environment are also probably different. In comparison

students from arts, social sciences, mathematics or natural sciences educational science students more often ranked the lack of clean water as being the most serious environmental problem. Educational sciences student will become future primary school teachers. Because water has a significant role in primary school science this has maybe influenced students' perception about environmental problems.

Among the university students, the main information sources for education for sustainable development were found to be firstly television, secondly newspaper and thirdly Internet, all in relatively equal measures. This finding is in accordance with the most of the studies carried out in the 20th century, see for example Asunta (2003), Lee (2008) and Boykoff (2009). Television has long been an important source for environmental information but the role of the Internet has also generally increased in the 20th century (cf. FICORA, 2010). Concerning the global problems such as those in this study, both the Internet and television news have been used together as an environmental news source (see Lacy et al., 2007). The role of these sources together is highlighted also in this study. The findings relating to the important sources of environmental information are in accordance with those of Riffe and Reimold (2008). They refer to an increasing potential role for the Internet to serve as an environmental news source, especially among young people and for environmental news on a national and international scale. The role of information sources in this study were also similar to the findings of Oztas and Kalipci (2009) who report that teacher candidates' major source of information about environmental risk factors were, in this order, radio and television, news-magazines, Internet, scientific books, and lectures. However, in this study the role of the Internet was found to be more important compared with the radio and magazines which were less important.

More often than male students, female students regarded climate change as the most serious environmental problem being in line with Svetina et al.'s (2011) findings about the difference between gender concerning the appreciation of sustainability. There were also differences in the students' opinions regarding the perceived environmental problem. Those, who did not select lectures as their information source for environmental issues, but received information from television, perceived the decrease in biodiversity as less important environmental problem. The same effect was not found concerning students who selected lectures as an information source; there was no evidence of the same difference between watching television and the perception of the decrease in biodiversity as being less serious environmental problem nor between lectures and the Internet or lectures and newspapers. These findings are partially in accordance with the statement of Shanahan et al. (1997) that there is essentially no bivariate relationship between television viewing and perception of specific threats to the environment. Namely the combination of lectures- television as information sources, did influence students' perception of the decrease in biodiversity as a serious environmental problem. This study did not ask about which form of television program had been the information source (c.f. Barbas et al., 2009). The role of television as an information source may be similar to that found by Nolan (2010) concerning the film "An Inconvenient Truth". Watching the film increases knowledge about the causes of global warming, however willingness to take action immediately after watching the movie does not necessary translate into later action.

## Conclusions

The high percentage in the understanding EE/ESD concept, can be explained by the fact that the largest group of students comprised of educational science students and ESD is included in the curriculum in educational science, particularly in teacher education. Conversely, the arts and social science students were studying multidisciplinary environmental science studies and therefore had knowledge about the SD issues. Yet, only half of the students do mention lectures as information source, even though sustainable development is explicitly mentioned, in the

strategy of the university in question, to be taken into account in all activities. Only one third mention friends as information source, this may indicate that the issue is neither a topic of discussion during the studies, nor a matter of student-centered, minds on and hands-on learning, or active participation learning with shared negotiations of meanings.

The university students ranked climate change as the most serious environmental problem, the second was the decrease in biodiversity and the third the lack of clean water. The Finnish media has drawn both international and national attention to climate change, lack of clean water and decrease in biodiversity which obviously have influenced students' perceptions. Those who brought television to the fore as an information source did not rank equally the decrease in biodiversity as a serious environmental problem. This may indicate that television is most often watched without any particular educational purpose or that television underestimates the decreasing biodiversity. Is it possible that desertification, erosion, over grazing and malaria are perceived as less serious problems by students just because they are not concrete, immediate, local environmental problems in Finland?

Knowledge about the environment and environmental problems is often based on beliefs that arise from nonselective screening of information. It is possible to encourage university students' critical thinking through the education for sustainable development by considering how media contribute to creating and spreading knowledge of sustainable development and environmental problems in general. The quality of information sources is important; how they make an active contribution to tackling the complexity of environmental problems and considering the ecological, social, economical and cultural aspect of sustainable development. Environmental awareness and discussion of global and local environmental problems, needs that there is enough scaffolding when considering the causes, effects and solutions as well as a sense of responsibility for taking actions.

The students considered the Internet to be a very important source of sustainable development issues, nearly as important as television and newspapers, therefore there is a clear need to develop pedagogical approaches for the use of the Internet in ESD education. Practices to be in accordance with the contemporary pedagogical theories need to be developed. Furthermore scaffolding is needed in the learning of complex environmental issues e.g. in order for the use of Internet to be relevant. Practices should also be examined to get reliable information about the usefulness and significance of the Internet's use for learning and its proper ways of scaffolding in education. It is also important, in further study, to investigate university students' perceptions about the quality of information sources and their preferences concerning reliable sources of scientific information on the environment.

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