

CHAPTER ELEVEN

EMPOWERED FOR ACTION? HOW DO YOUNG PEOPLE RELATE TO ENVIRONMENTAL CHALLENGES?

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Introduction

Creating environmentally active citizens is crucial for the future environmental development. Through the slogan 'Science education for action' Jenkins (1994) addresses (among other subjects) the environmental protection issue and calls for 'integration of knowledge with action'. The background for this chapter is that we subscribe to the notion of responsible and successful action as a prime goal of science and environmental education, and that we wish to bring into light some essential conditions for purposeful action. We see environmental *empowerment* as a prerequisite to action. On the assumption that successful environmental actions require environmental empowerment, we argue that empowering young people to deal responsibly with environmental issues should be a principal concern of education. Empowerment may be described as encouragement for action and belief in one's possibility and ability to influence one's surroundings. It is important to understand the attitudes, beliefs and prejudices that might prevent individuals from recognising and using their possibilities to act.

We are aware of the debate among educators, environmentalist and scientists concerning purposes of schooling in general and science education in particular. One view is that education should equip the students with knowledge and skills, but that it is up to the students themselves to decide *how* to apply these competences; otherwise education risks becoming indoctrination. While we acknowledge that this view makes an important point, we argue that some values, e.g. values of democracy, peace, equity, human rights

and environmental protection, are universal. The German philosopher and educator Wolfgang Klafki (2001) sees the mission of education as inseparable from the challenges facing a society, and he characterises the environmental issue as one of the four key problems facing our time. We concur with this view and will not categorically disallow science education to act as agent of influence on students' environmental value preferences.

On this basis, we see science education as having a key role in preparing young people to cope and deal responsibly with the emerging environmental challenges. Teaching must be based on knowledge of students' attitudes to the environmental protection issue. Research in science education have taught us a lot about students' conceptual understandings (and 'misconceptions' or 'alternative conceptions') of science contents, but less about their attitudes, priorities and decision-making regarding environmental matters. In this chapter, we are aiming at deepening our understanding of challenges facing us as science educators in our endeavour to develop students empowered for environmental action by presenting findings from analysis of survey data. The ideological and theoretical perspectives on which this chapter is based, is more thoroughly described by Camilla Schreiner, Ellen K. Henriksen and Pål J. Kirkeby Hansen in a review article submitted to the journal *Studies in Science Education* (accepted for print in the 2005 issue). The authors assume that in order to be empowered to meet the environmental challenges, a person must:

- have hope and visions for the future
- have a general feeling that she or he can influence the future of the world and be motivated for action towards environmental issues
- think that environmental protection is important for society
- be interested and engaged in the issue

She or he must also have sufficient knowledge about the science of the environment, about possible adequate actions in terms of personal lifestyle, technical solutions and political measures and about possible channels of influence through politics, organizations, etc. But as our empirical material do not have any measures of the

knowledge component of empowerment, we will not pursue this any further in this chapter. Here we will concentrate on empirical findings addressing the bullet issues above and take in some few pieces from the above referred article on perspectives from literature (Schreiner, Henriksen & Hansen, 2005).

Our data are collected through the ROSE survey. ROSE, The Relevance of Science Education, is an international comparative research project meant to shed light on affective factors of importance to the learning of science and technology (S&T). The target population are students towards the end of secondary school (age 15). The research instrument is a questionnaire mostly consisting of closed questions that offer the respondents fixed alternative responses. The respondents give their answers by choosing the alternative appropriate to their view. Among other issues, the questionnaire addresses their interests in learning different S&T topics, their experience with and views on school science, their views and attitudes to science and scientists in society, their future hopes, priorities and aspirations and their feeling of empowerment with regards to environmental challenges. This latter point will be the focus of this chapter. The rationale behind the project, including the questionnaire development, theoretical background, procedures for data collection, etc. is described in Schreiner and Sjøberg (2004). This report, as well as other information on the ROSE project, can be found at <http://www.ils.uio.no/forskning/rose/>

International comparisons may give important insight into the diversity and similarities in youth's views in different cultures. On the other hand, national analysis facilitates a deeper dive into the material, as relationships between variables, reliability, validity, etc. are properties of the data rather than of the instrument. Since data collected with one instrument may result in different indices in different cultures, cross-cultural analysis calls for close inspection of each national sample. Including international comparisons would bring this text beyond the specified volume limit. Therefore, in this publication we will only report results from the Norwegian material. However, our preliminary experiences with the ROSE data indicate that results from the Norwegian sample follow the same pattern as other North-Western European countries (e.g. countries in the UK

and Scandinavia). This profile does in turn often contrast the profiles of less economically developed countries in Africa, Asia and South America.

Method

The survey was conducted in Norway in November and December 2002. 58 schools and one class at each school were randomly sampled. This gave a total sample of 1204 Norwegian respondents. The sample represents the population of all Norwegian 10th grade students. This is the level when all students turn 15 years old. (More details on how the ROSE survey was organized in Norway are given in Schreiner, 2004).

Most questionnaire items follow the same basic structure: A statement is presented and the students are requested to give their response by choosing the appropriate box in a four-point Likert scale. The four response categories go from 'small' to 'large': Disagree–Agree, Not interested–Very interested, Not important–Very important, etc. A response in the first category (Disagree, Not interested, Not important, etc.) is coded 1, in the second 2, etc. A response in the last category (Agree, Very interested, Very important, etc.) is consequently coded 4.

It is common practice to code the scale by assigning numerical values to the response categories, and to regard Likert scales as quasi-interval scales (Ary, Jacobs & Razavieh, 1996). However, when handling the coded data as values in an interval scale, we presuppose that the distance from category 1 to category 2 is identical to the distance from category 2 to category 3, etc. In methodology literature, issues like these are debated, but it seems to be a wide acceptance to use Likert scales as we are indicating here.

In order to overcome the amount of data, condense the characteristics of the questionnaire items, achieve more reliable and valid data and to enable us to lift the discussion up from single items responses to a more general level (Hellevik, 2002), some questionnaire items have been grouped into clusters, checked for unidimensionality and internal consistency and then, if found reasonable, merged into composite variables. The composite variables

applied in this chapter are developed from the average scores of the items constituting the variables. The number of items in each composite variable differs. Adequate interpretation of the common factor underlying one group of items is crucial for valid understanding of findings based on scores in a composite variable.

Before merged into the various composite variables, the items were divided into clusters by drawing on a combination of exploratory factor analysis, the original intention of the items from when the questionnaire was developed and reliability testing with Cronbach's alpha. Cronbach's alpha is a measure of internal consistency within a group of items, based on item covariances. The maximum value of the coefficient is 1. Because cognitive skills tend to be more stable than affective features, cognitive measures often report alphas in the high .80s or low .90s, while .70 is one widely accepted cut-off point for alpha in affective instruments (Gable & Wolf, 1993; Nunnally, 1978). From a Cronbach's alpha of .70, we can interpret that 30% of the composite variable variance is error variance, while 70% can be considered as true variance.

The output from a statistical significance test is the probability that we, based on findings from the sample, are claiming a false difference or relation between variables for the whole population. The significance test takes, among other parameters, into account the sample size. In a study like ROSE, with a large sample size, most differences and relations between variables are found to be statistically significant at the one-percent level. When our findings are not statistically significant (i.e. higher than one percent), the parameters always have vanishing effect sizes (i.e. standardised differences). Unless something else is given, all differences and relations presented in this paper are statistically significant at the 0.01-level.

Results and some perspectives from literature

In this section we will present variables and scores both for composite variables and for some single items that have not been employed in any composite variable. Rather than having one theoretical section with the framework for understanding our findings, we will involve perspectives from literature as and when it is relevant. Gender differences

will be reported in cases where we consider the magnitude of the differences to be of educational interest.

Do youth have hope and visions for the future?

Beliefs about what the future will bring contributes to the meanings one gives to the present (Bell, 1997). People's images of the future affect actions in the present, as people either try to adapt to what they see coming, or to act in a way that creates the future they wish for. Hope encourages action (Eckersley, 2002). Future images are influenced by the background, experiences, knowledge, etc. of each individual and by social and cultural factors such as mass media, public discussions and the zeitgeist of the era and the society. By knowing the youth's images of the future, we can better understand their present motivation, choices and actions. The images students hold of the future are consequently of interest to science and environmental educators (Hicks, 1996; Lloyd & Wallace, 2004; Palmer, 1998).

In 1974, Alvin Toffler disclosed a discrepancy between the personal and the global images US youth held of the future (Toffler, 1974). Since then, numerous studies of youth in Western societies have confirmed his finding of personal optimism and global pessimism - the further the images go from the personal level, the darker and more hopeless they get: Young people's images of their personal futures are optimistic and full of hope. With focus on education, nuclear family, occupation and leisure, they feel able to design and create their own good and happy personal future. When it comes to the local and national future, with problems like drug abuse, crime, unemployment, sexism, racism and local pollution, they show a large degree of pessimism, but they also expect some improvements. But when they view the future of the globe, their images are more pessimistic. War, environmental devastation, overpopulation and famine are their main global fears, and they expect continuation or worsening of the global problems in the future (Brunstad, 2002; Eckersley, 1987, 2002; Gidley & Inayatullah, 2002; Head, 1997; Hicks, 1996; Lloyd & Wallace, 2004; Rubin, 2000).

The ROSE data give us the opportunity to separate the environmental problems from other future challenges of the globe. What can our data say about youth's view of the future in relation to the environmental challenges? Are they optimistic or pessimistic? One question in the instrument is introduced with the heading 'Me and the environmental challenges' and the following text:

To what extent do you agree with the following statements about problems with the environment (pollution of air and water, overuse of resources, global changes of the climate, etc.)?

The response scale goes from 'Disagree' (coded 1) to 'Agree' (coded 4). The value 2.5 constitutes the middle of the scale. This means that an average score of 2.5 may be considered as 'neutral', meaning that the students in average neither agree nor disagree with the statement.

Three items intended to tap into the future images held by the respondents (Table 1), but they show weak inter-item correlations. Good measures in the affective domain can typically have inter-item correlations in the range of .30-.40 (Gable & Wolf, 1993), while the largest correlation coefficient between these three items is .20. The internal consistency is consequently unsatisfactory, and we cannot defend merging the items into one composite variable. In spite of these reliability problems with these three items, we will in the following report single-item scores in order to try to understand and validate the items. Results will be given for the total sample, as there are no noteworthy differences in girls' and boys' responses.

D02. Environmental problems make the future of the world look bleak and hopeless
D07. We can still find solutions to our environmental problems
D14. I am optimistic about the future

Table 1. Items addressing views of the future.

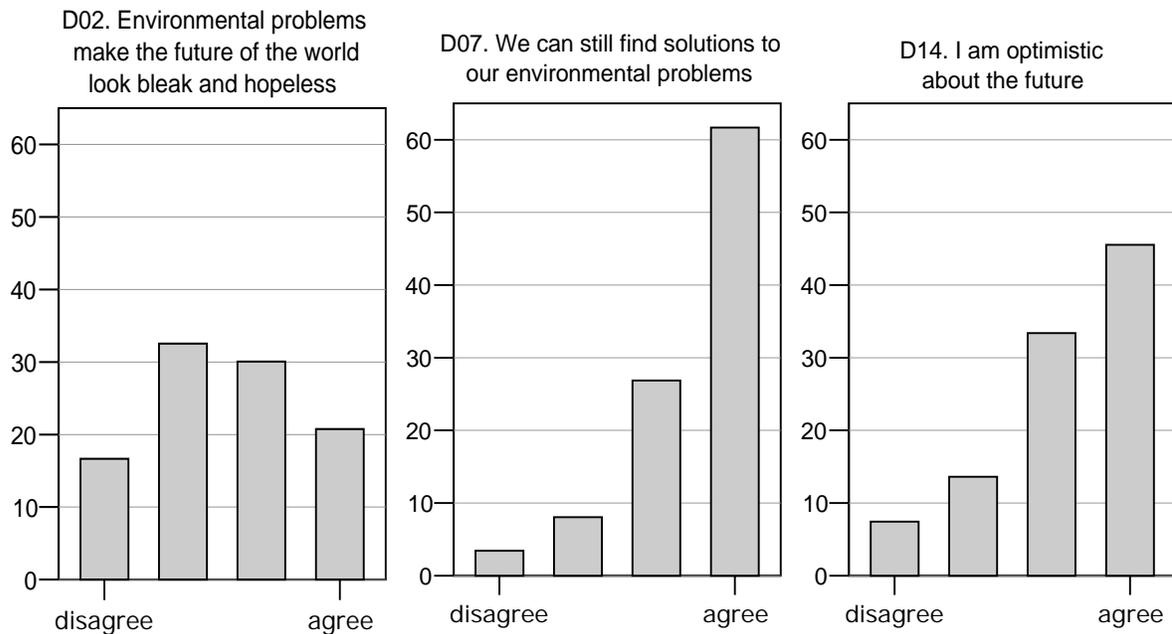


Figure 1. Views of the future (item D02, D07 and D14). Percentages of responses in the four response categories from disagree to agree. (Due to some missing responses, the bars in each diagram do not add up to exactly 100 percent).

The responses in the three items do not portray youth as holding apocalyptic expectations to the future (Figure 1); maybe in contrary to what one could expect from the perspectives above drawn from literature. Among the three items, item D02 is the one most directly addressing the *environmental problems* and the *future of the world*. A mean score close to 2.5 implies that in average, the students neither agree nor disagree with the statement that the future of the world looks bleak and hopeless due to the environmental problems.

Item D14 ('I am optimistic about the future') was meant to be an opposite (negative) statement about the issue in D02. But this item text neither mentions explicitly the future *of the world* nor the *environmental problems*. The rather weak relationship between D02 and D14 (correlation coefficient -0.20) implies that the two items do not function as positive and negative statements about the same underlying factor. Although item D14 is located under the questionnaire heading 'Me and the environmental challenges', the response suggests that the students may have interpreted this item outside the global environmental context. The mean score in item D14 is 3.17, which is a fairly optimistic

expression. We find it likely that the D14 item for some students may have denoted their *personal* future, which in other youth studies is found to be more optimistic and hopeful than the future of the globe (described above). This may be one of the reasons for the weak relationship between the two items.

Item D07 displays a very hopeful profile (Figure 1) with mean value close to 3.5. The students strongly agree that we can still find solutions to our environmental problems. Question D02 and D07 are not correlated, so students agreeing that the future looks hopeless (item D02) may as well agree that we still can find solutions to the environmental problems (item D07). This should not be regarded as illogical or inconsistent responses, as a person may consider that even though it is *still not too late* to intervene and solve the problems (item D07), there is little hope that humanity actually will do so (item D02). This means that the two items may tap into substantively different issues (although they were designed for measuring the same).

In this section we wished to focus on the environmental problems and students' images of the future of the globe. The above elaboration on the three questionnaire items addressing images of the future leads us to conclude that item D02 ('Environmental problems make the future of the world look bleak and hopeless') is probably the only item that was worded sufficient precisely for tapping into this issue. In exploratory factor analysis we find this item loading on the same factor as 'Nearly all human activity is damaging for the environment' (item D17) and 'Science and technology are the cause of the environmental problems' (item G10). These items have in common a rather discouraging characteristic of the state of the world. Although item D02 does not show a striking dark future view held by the students, it is worth noticing and commenting on the 50 percent of the students, both girls and boys, agreeing (fully or partly) that the future of the world looks hopeless due to the environmental problems (Figure 1). It would be interesting to pursue these students through the data material, and characterise them in terms of other dimensions in the survey, but this would be beyond the scope of this chapter.

Are youth personally engaged in the environmental protection issue?

The sociologist Ulrich Beck sees risks as one of the main outcomes of globalization and technological and economical development and as contributing to the formation of a global 'risk society'. Until quite recently, people and societies were threatened by environmental risks that were unrelated to human activity; like drought, earthquakes, volcanoes and storms. But the nature of the risks is changing. Globalisation presents us with new risks that are incalculable in origin and indeterminate in consequences. Today we meet ecological risks that are created by our own interventions with nature, social development and development of S&T. The environmental problems are generated from human decisions and actions, but still they are diffuse in origin and have unknown and unfixed outcomes. Since the possible disasters are detached from individual responsibility, it is unclear who are responsible for finding answers to the problems and taking action to them (Beck, 1999).

Environmental protection is a prime concern in many facets of society. New taxes and duties are imposed, and people must deal with new laws and regulations, and adopt new practices. In this way public awareness about the environmental challenges is stimulated, but this does not necessarily develop positive and progressive attitudes. Our knowledge- and education society is frequently portrayed as a social system of technocracy, where citizens are alienated from responsibility and lacking faith in their own opportunity to influence the societal development. They may believe that environmental problems should be left to the 'experts'.

Moreover, people in Western information societies have access to large amounts of information, and today's young people have experienced the untrustworthiness of scientific discoveries and theories, and they know that knowledge may be contestable, short-lived and after a period outdated. Arguably, this makes people less convinced about 'truths' and 'facts', and creates a world in which individuals have become increasingly reflexive (Giddens, 1991). As we get new information and attain new knowledge, we consider and reconsider, design and redesign, and develop and redevelop our selves, our beliefs and our actions.

Descriptions as these are examples of some scientific, societal and political complexities challenging environmental education for empowerment. As described in the rationale of the ROSE study (Schreiner & Sjøberg, 2004) some questionnaire items were initially developed with the intention of measuring various specified aspects of students' attitudes towards environmental protection. Again, in order to prevent response biases in the survey and thereby strengthen the reliability of the measures (Horan, DiStefano & Motl, 2003), we used the strategy of addressing the same issue with some items positively and some negatively worded. However, exploratory factor analysis did not confirm the existence of the intended underlying variables. The factor analysis sorted the items in two separate factors: positively worded statements in one factor and negatively worded items in another. This is a well known effect of wording (see e.g. Horan & al., 2003; Marsh, 1996). However, the interpretation of this result is still undecided: Are the wording effect a systematic irrelevant methodological artefact? Or are there substantive conceptual differences between negatively and positively worded items? Or may it be that this division of negatively and positively worded statements stems from response styles and personality traits of the respondents?

We will not go any further into this discussion, as we regard it as closer to the field of psychometrics than to science education. Through our conceptual analysis of the two item clusters, we found that the appearing factors were substantively meaningful. Consequently we will pursue the item clusters suggested by the factor analysis.

The negatively worded items seem to have in common a *lack of concern* for the environmental issue (Table 2). These items indicate that the environmental problems are exaggerated, that people cook up the problems, and that the individual puts a distance between her- or himself and the problems. If at all necessary, it is the task of somebody else to solve them. On the other hand, the positively worded items are describing a personal *involvement* in the issue (Table 3. Item D07 from above is reappearing in this item cluster). These items describe attitudes towards the environmental problems

suggesting that it is still possible to overcome the problems, a belief that every individual can make an important difference, and a willingness to act.

D01. Threats to the environment are not my business
D03. Environmental problems are exaggerated
D08. People worry too much about environmental problems
D09. Environmental problems can be solved without big changes in our way of living
D13. Environmental problems should be left to the experts

Table 2. Negatively worded items; describing a lack of concern for the environmental issue.

D05. I am willing to have environmental problems solved even if this means sacrificing many goods
D06. I can personally influence what happens with the environment
D07. We can still find solutions to our environmental problems
D10. People should care more about protection of the environment
D12. I think each of us can make a significant contribution to environmental protection

Table 3. Positively worded items; describing a personal involvement in the environmental issue.

As the two groups of items show sufficient internal consistency, with Cronbach's alpha equal .69 for and .71 for 'Lack of concern' and 'Involvement' respectively, we have computed two composite variables from the average scores of the items in each factor.

The average scores in these two composite variables for girls and boys expose students holding 'socially accepted' attitudes to the environmental issue (Figure 2). The mean values for the variable 'Lack of concern' is 2.1 for girls and 2.3 for boys. Mean values for both sexes below the neutral 2.5 imply that the students in average disagree with statements indicating a lack of concern for the environment. Girls disagree somewhat stronger than boys. But on a disagree-scale ranging down to 1, these mean values show that neither of the sexes *strongly* disagree. That the students are lukewarm about the issue can be seen as confirmed by the scores on the 'Involvement' variable: Mean scores close to 3.0 for boys and 3.1 for girls (Figure 2) show not much conviction to statements conveying personal involvement in the environmental issue.

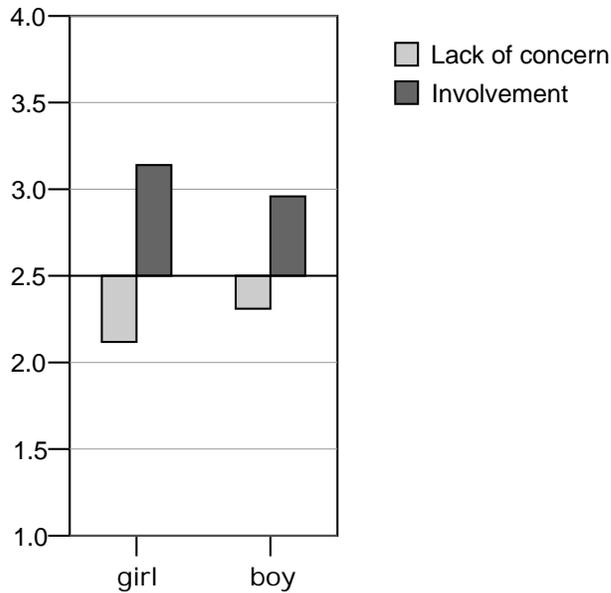


Figure 2. Means for girls and boys: Agreement (bars turning upwards) and disagreement (bars turning downwards) to the two composite variables 'Lack of concern' (average of items in Table 2) and 'Involvement' (average of items in Table 3).

The two composite variables are negatively correlated with a coefficient value of -0.45 . This relationship indicates that the two variables may be tapping into a common underlying factor on the topic of environmental protection. This brings us back into the methodological discussion mentioned above on positively and negatively worded statements. It may be that the substantive meaning of the one composite variable is close to the meaning of the other, although oppositely stated. We do, however, not see this discussion as important for our results. The conclusion we can draw from these two groups of items will nevertheless be that the students to some extent express concern about the environmental issue; girls somewhat more than boys, but it does not seem to be a matter of great significance to them.

In a Norwegian youth study, Brunstad (2002) found in that although his informants had the relevant knowledge and insight, they had no feeling of having a possibility to affect the global development. Despite the moderate scores in our survey, we will not say that our data support his finding.

Do youth find environmental protection important for society?

Thomas Ziehe sees late modernity as imposing a disruption between the individuals and the past and between the individual and her/his own culture (Ziehe & Stubenrauch, 1993). Late modern youth are culturally and socially liberated and freed from traditions and norms, and regardless of social background they have access to social goods such as education. But youth do not only have the *freedom* to choose between infinite options - they are *forced* to choose. And if they fail, they are responsible for the wrong decisions and choices. They try to find the area in which they have their interests and abilities, and to create their own good and meaningful life. Furlong and Cartmel (1997) see this struggle for finding one's own way ahead so demanding that modern youth show traits self-centredness.

Turning again to our study: One part in the ROSE instrument contains an inventory of goals for a society, of which three items are addressing the environmental issue. The students were requested to indicate how important they found each of the goals for our society by ticking the appropriate box in a ten-point Likert scale. A response in the first category (not important) was coded 1, in the second 1.33, in the third 1.66, etc. From this follows that a response in the 10th category (very important) was coded 4.

In a universe of thinkable tasks and ambitions for a society, the limited numbers of items in this question (Table 4) are of course only a small and unrepresentative sample of possible goals. Nevertheless, we will in the following have a closer look at the scores of the three items regarding environmental protection by seeing them against a background of some other societal goals.

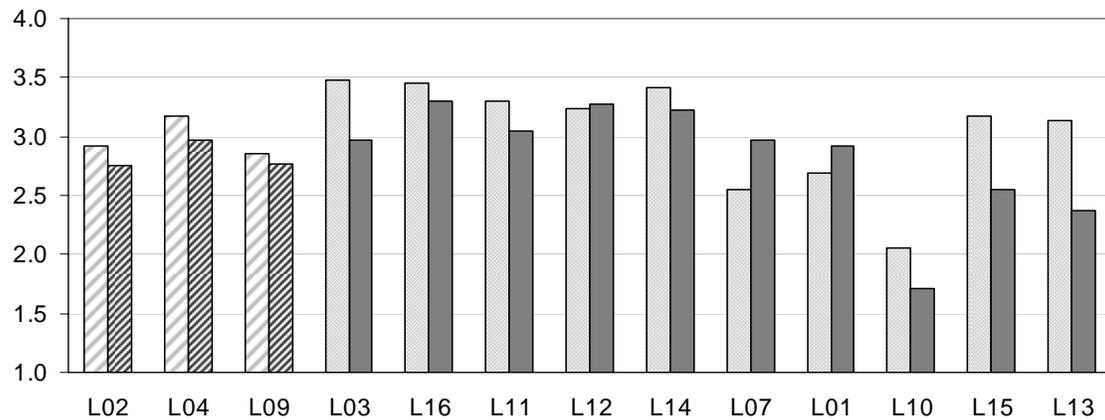


Figure 3. Important for our society: Mean scores for girls (light bars) and boys (dark bars) for the items in Table 4. Gender differences are not statistically significant for item L09, L12 and L16. The three leftmost bar clusters show scores for items addressing the environmental issue (item L02, L04, and L09; diagonal stripe pattern).

L02. Protect untouched Norwegian nature
L04. Protect the environment against pollution
L09. Provide protection of our big predators
L03. More emphasis on medical research (e.g. on cancer and HIV/AIDS)
L16. Provide a society free from drugs
L11. Eradicate all forms of poverty and distress in Norway
L12. Lower taxes and duties
L14. Enhanced emphasis on education and better schools
L07. Enhanced emphasis on research on new technology
L01. Achieve high economic growth
L10. Prepare Norway for welcoming more refugees and immigrants
L15. Give economic support to poor countries
L13. Use gender quotas to have more women in senior appointments

Table 4. Items for various goals for a society. The three first rows are items addressing the environmental issue (item L02, L04, and L09; boldface).

The three items related to the environmental issue (item L02, L04 and L09) show some internal consistency (Cronbach's alpha comes to 0.74). On a scale from one to four, the mean score of the composite variable calculated from these three items lies close to 2.9, which is fairly high in a priority scale ranging from 1 to 4. This means that the students give high scores to the importance of environmental protection. Girls find this goal somewhat more important than boys (3.0 and 2.8 respectively), but the difference is small

(although statistically significant for the composite variable). Furthermore, we find that, except from L10, nearly all items in this question achieve high scores (Figure 3). This means that the students responded that through the list of items in this question, most of them refer to issues that they find important for our society. Looking at the three 'green' items in relation to the others, the overall picture is that environmental protection is not prioritised above other issues. Lower taxes, better schools and a drug-free society (item L12, L14 and L16) receive higher scores from both girls and boys, while 'gender quotas...' (item L13) achieve higher scores from the girls. These are issues closer and maybe more relevant to themselves and their concerns in their young lives.

Girls give higher priority to health research (item L03) than to environmental protection. The health focus among the girls is in accordance with other questions in the ROSE questionnaire as well as with several youth studies (e.g. Bø, 1999), disclosing a considerable concern for health- and body-issues among young people in general and girls in particular.

Economic growth and research on new technology (item L01 and L07) are the only items where the boys give statistically significant higher scores than the girls. Other studies (e.g. Hellevik, 1996) find that boys are more infected by the race of affluence than what is the case for girls. But although the girls, contrary to the boys, give less priority to national economic growth (item L01) than to environmental protection, they give high priority to the goal regarding their *personal* economic prosperity (item L12).

A similar national–personal pattern can be read out of the items regarding foreign aid. The scores on the item for giving economic support to poor countries (item L15) are much higher than for welcoming more refugees and immigrants to Norway (item L10). The latter is more likely to threaten youth's personal success and happiness in life. Immigrants will be candidates in the same labour, love and housing market. The cause of the low scores in item L10 is probably very complex, but one part of it may be that they perceive immigration as a threat for the success of their personal life.

How interested are Norwegian youth in learning about the environmental challenges?

The last facet of our concept for empowerment is the students' interest in learning about the environmental issue. For this purpose we will use a part of the questionnaire consisting of an inventory of possible topics to learn about; in total more than a hundred items. The students were requested to indicate in a four-point scale how interested they were in learning about the various topics.

Eight of the items are addressing the issue of environmental protection (Table 5). The group of items has a Cronbach's alpha of .88. Merged to one composite variable, this gives a mean value of 2.2. Both in an absolute and relative sense, this is a low score, which means that neither girls nor boys regard environmental protection as a matter of particular interest. The gender difference between the means of the composite variable is not statistically significant.

Seen in relation to the other topics in this part of the questionnaire, the environmental protection issue achieves low interest scores. For example, we find that topics referring to human body and health achieve much higher scores among the girls. We find statistically significant differences between girls and boys for the three items with an element of technology, invention and/or energy (item for E06, E20 and E21, Figure 4). This resembles the gender difference pattern through the remaining of the hundred items; boys displaying more interests in technology and physics than girls. (This pattern is consistent with the picture from Figure 3.)

E05. What can be done to ensure clean air and safe drinking water
E06. How technology helps us to handle waste, garbage and sewage
E03. The ozone layer and how it may be affected by humans
E04. The greenhouse effect and how it may be changed by humans
E33. Benefits and possible hazards of modern methods of farming
E19. Organic and ecological farming without use of pesticides and artificial fertilizers
E20. How energy can be saved or used in a more effective way
E21. New sources of energy from the sun, wind, tides, waves, etc.

Table 5. Items with environmentally oriented topics to learn about.

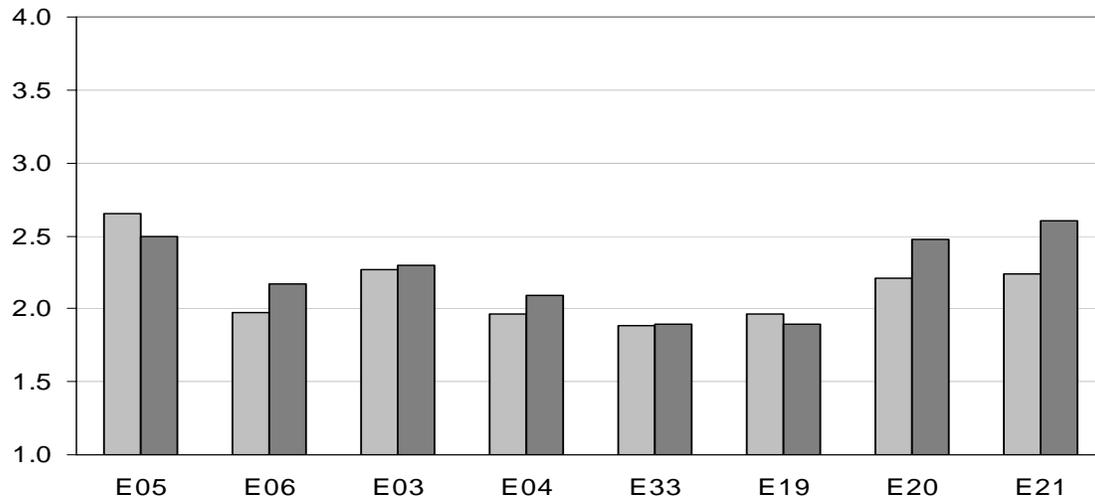


Figure 4. Mean scores for girls (light bars) and boys (dark bars) for interests in learning about the environmental protection topics in table Table 5. Gender differences are statistically significant only for E06, E20 and E21.

In the section above we interpreted that that issues of *individual* relevance were of greater concern than issues with bearing for the society and the globe. Mean scores for these eight items may be perceived as analogous with this: the item closest connected to the life and the health of the individual (clean air and safe drinking water; item E05) achieves a relatively high interest score. (This does in fact surprise us, as this matter is not of general public concern in a Norwegian context. Our national identity is partly based on an idea of 'untouched nature'; including clean air and drinking water.) Again this may be understood as an apprehension of individual risk.

Conclusions and implications

We have argued that empowering students to act responsibly with the environmental issue should be an important goal of education. By dividing the concept 'empowerment' into different aspects and subheadings, we have presented findings from the Norwegian data from the ROSE project.

Results from our analysis give us the overall impression that the students are only moderately engaged in the environmental issue, but the findings do not draw a very problematic portrait of the youth. They do not seem unconcerned about or alienated from

the environmental problems, they think we still can find solutions to such problems, they see the individual contribution as important and think that they personally can influence what happens to the environment. But the engagement is not striking. Especially the boys are only just within the bounds of the 'politically correct' and the 'socially accepted' attitudes. When it comes to the students' interest in learning about the environmental issue, they show little curiosity. Although many scientific subjects attract different interest among boys and girls, both girls and boys are equally lukewarm about learning about the topic. The result that may be perceived as the most disturbing is the fact that 50 percent of the students responded that they agree that environmental problems make the future of the world look bleak and hopeless.

Heilbroner (1995) found that from roughly 300 years ago until the second half of the twentieth century, people in the West thought the future would be superior to the present. But as he approached our current period, he found that in advanced industrial and capitalist societies the visions of the future have been noticeably altered towards darker and more pessimistic images. This means that today's young people are growing up with a social background of general public global future pessimism, and not surprisingly, they inherit these pessimistic views of the future and a limited sense of influencing it. Hicks (1996) refers to sources of expertise and experiences on how to engage students in envisioning a preferred future, and argues that these so far has not been sufficiently utilised by environmental educators. Among such resources he refers to the work of Jungk and Müllert (1987), Ziegler (1989) and Boulding (1988). Other valuable recourses may be Stapp (1996), Gidley & Inayatullah (2002) and the World Yearbook of Education edited by Hicks and Slaughter (1998). One common denominator in many such strategies for environmental education for empowerment seems to be stimulating students' awareness of what future they would prefer. People seem to know what they fear and what they could fight *against*, but are under-articulated about what they want for the future; what they would fight *for*. Empowering young people for action towards a future better than the one they expect should consequently involve visualising the alternatives and the goals one wants to work towards.

We suggest that environmental education should engage students in articulating, discussing and eventually acting on the particular problem. In addition to going through *what we know* about the subject, the process should address questions like (adapted from Hicks & Holden, 1995)

- What do we think, feel, hope and fear in relation to the environmental problem? What do others who are involved think, feel and say?
- Why do we and others think, feel and act (or not act) in the way we do? What and who has influenced us? What is the history of this situation?
- Who has the power in this situation and how do they use it?
- What would things look like in a more just and sustainable future? What values will we use to guide our choices?
- What are the possible courses of action? What are others already doing? Which course of action is most likely to work for our preferred future?
- How shall we implement our plan of action in school, at home and in the community? How shall we work together? Whose help might we need?
- How can we evaluate the outcome and measure our success?

Other studies find that the predominant factor motivating for environmental protection in Western societies is the perception of risks, and to a smaller extent the value of nature per se (e.g. Skjåk & Bøyum, 1993). Also our data indicate that societal and environmental matters, such as environmental risks or challenges facing a society, achieve more concern when the matters are connected to the personal life of the student than to challenges on a more distant societal level. Some researchers interpret such findings in terms of characteristics of the so-called 'here-and-now' generation or the 'me'-generation. The project of realising themselves and finding their way ahead is so large and demanding that it gives self-centred youth with focus on the process of shaping their own identity and happiness - disconnected from societal matters. Øya (1995) offers another understanding of such findings: While older generations might conceive the environmental problems as 'new', today's young people do not know a childhood free from environmental problems; the problems are conversely a kind of inborn or natural

part of their everyday life. The environmental challenges are an accepted state of the world, but this does not imply that they are unconcerned and unengaged in the matters.

The concern of self-actualisation and shaping ones own identity and happiness may be seen as a product of the prevailing ideas and spirit of our time. Results from the international ROSE material shows that in average youth from all survey countries, spread all over the globe, highly wish to be engaged in something they find important and meaningful, but we know that cultures put different meanings in the concept 'important and meaningful'. Western societies stress the importance of *living our lives to the fullest*. We preach for our children that the most important thing is that they are occupied with things they like, find interesting and are good at. Or with the words of the sociologist Zygmunt Bauman - seeing 'corrosion of citizenship' as the other side of individualization:

if individualization spells trouble for citizenship and citizenship-based politics, it is because the concerns and preoccupations of individuals qua individuals fill the public space, claiming to be its only legitimate occupants - and elbow out everything else from public discourse. The 'public' is colonized to the 'private'; 'public interest' is reduced to curiosity about the private lives of public figures. (Bauman, 2001)

When the prevailing public concerns of our time are connected to individualisation, identity formation and self-actualisation, societal and global developments may be perceived as of little consequence. One may interpret that this gives narcissistic citizens - disconnected from societal matters. In our context the term *narcissism* should be understood as a trait of a culture or a general mentality. Narcissism should be seen as a concern lying much deeper than individual self-admiration and self-centeredness. Narcissism is about worry and concern for values emphasized by individualisation: developing a unique identity, constructing a body, fulfilling and developing one's potentials, avoiding dangers and risks - and ensuring future happiness. Narcissism can consequently be perceived as necessary attention and love for oneself and as a credible and acceptable consequence of late modern individualization.

If these traits of narcissism are characteristics of youth in modern societies, one would expect that youth from North-Western Europe will display a profile differing from profiles of youth in less developed and modernised countries. In order to achieve a deeper understanding of how the effect of the societal zeitgeists vs. the effect of schooling influence young people's attitudes towards the environmental challenges, we would like to see more comparative research on issues discussed in this chapter. Cross-cultural comparisons in the ROSE material may, among other studies, be able to give us more knowledge about such issues. But whatever those findings may say - changing the prevailing level of interest, hope and concern among youth cannot be done within science classrooms alone. In order to design a suitable science and general education for future citizens, some rethinking needs to be done (and is, indeed, occurring) regarding curriculum content and structure, teaching methods, teacher education and in-service training, and development of suitable resources. It is our hope that these efforts will continue and eventually contribute to an education for empowerment for all citizens – and to a corresponding responsible management of our environment.

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