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Developing Attitudes towards Human Rights through Socioscientific Issues in Science Courses: An Action Research¹

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Abstract

This study, aiming at developing attitudes towards human rights through socioscientific issues in science courses, was designed as an action research. The study covers 28-week implementation on 26 8th grade students. Data were collected through printed documents, human rights attitude scale, unstructured observation, and teacher and student diaries. Qualitative data of the study were analyzed via content analysis. Statistical analysis was carried out for the change in human rights attitude scale scores. Study findings indicated that students developed understanding and attitude towards many human rights within the scope of first, second and third generation rights in science courses through practices based on socioscientific issues. Human rights attitude scale scores increased at a significant rate as well. Moreover, it was also stated that problems of meaning-making, suggesting ideas which do not comply with human rights and insisting were encountered.

Keywords: science education, socioscientific issues, human rights education, action research, curriculum and instruction



Desarrollo de Actitudes en Derechos Humanos vía Cuestiones Sociocientíficas en Ciencias: Una Investigación Acción

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Resumen

Este estudio, con el objetivo de desarrollar actitudes hacia los derechos humanos a través de temas sociocientíficos en los cursos de ciencias, fue diseñado como una investigación-acción. Él cubre la implementación de 28 semanas con 26 estudiantes de octavo grado. Los datos fueron recolectados a través de documentos impresos, escala de actitud de derechos humanos, observación no estructurada y diarios de maestros y estudiantes. Los datos cualitativos se analizaron mediante análisis de contenido. El análisis estadístico se fijó en las puntuaciones de escala de actitud de derechos humanos. Los resultados indicaron que los estudiantes desarrollaron comprensión y actitud hacia muchos derechos humanos dentro del alcance de los derechos de primera, segunda y tercera generación en cursos de ciencias a través de prácticas basadas en temas sociocientíficos. Las puntuaciones de escala de actitud de derechos humanos también aumentaron a una tasa significativa. Además, se encontró problemas de creación de significado, que sugieren el no cumplimiento de los derechos humanos.

Palabras clave: educación científica, temas sociocientíficos, educación en derechos humanos, investigación-acción, currículo e instrucción



Human rights (HR) are defined as justice and equality principles which are considered general (Sajan, 2010) or global rights stemming from the very existence of humans in relation to equality (Flowers, Bernbaum, Rudelius-Paimer & Tolman, 2000). The inherent nature stemming from the self-esteem and dignity a person has (Donnelly, 2013), universality, equality for all (not discriminating people) can be considered as the characteristics of these rights (Praveen, 2007). Human rights education covers activities and practices to develop knowledge, skills, understanding, attitude and awareness which are necessary for promoting, preserving and advocating fundamental rights and freedoms in order to create a universal HR culture (CoE, 2010 cited in Waldron, Kavanagh, Kavanagh, Maunsell, Oberman, O'Reilly, Pike, Prunty, & Ruane, 2011). HR education can be carried out in the forms of informal, formal and non-formal education (Brander, Keen, & Lemineur 2002). The formal HR education process, which is carried out in education institutions, starts with early childhood education and goes on to university education covering teacher training practices (Banks, 2002). HR education in formal education can be given as a separate course or through connections in various courses. Considering that developments in science and technology have influence on fundamental rights and freedoms and they should be dwelled on with much attention, one of the courses which can be linked to HR education is science course (Brown, 1981). Developments in science and technology covers social, moral and ethical values and are related to political and human values as well. Science education is an opportunity for students to realize the connection between science and social problems, their own responsibilities and the possibility of using scientific information for social justice and HR. In this sense, it is possible to say that HR education can be given within science courses (Jennings & Eichinger, 1999). Problems which occur depending on developments in science and technology can be considered as an important context in science courses (Jennings & Eichinger, 1999; Rundgren, 2011). Social dilemmas and arguments having ethics and moral meanings in their cores and emerging due to science and technology products and processes refer to SSI (Sadler & Zeidler, 2005a). Bioethics, nuclear power plants, global warming, alternative energy sources, animal experimentation or testing can be given

as examples to SSI (Sadler, 2004). SSI describe political, moral and social aspects of science and technology based situations (Sadler & Ziedler, 2004). Global warming, human genome project, cloning and many other SSI are controversial issues in terms of HR as well (Clarke, 2010; Rademacher, 2010). These issues are also mentioned in international documents such as Convention for the Protection of Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine: Convention on Human Rights and Biomedicine (Council of Europe, 1997) and Charter of Human Rights of the European Union (2000, cited in, Brander et al., 2002) within the context of fundamental rights and freedoms. Relevant literature indicates that recently HR have been explored within these contexts which are considered as SSI. These studies dwell on developments in biotechnology (Hornosty, 2011; Sweet & Masciulli, 2011), global warming and climate change (Clarke, 2010; Moro, 2002; Rademacher, 2010), debates regarding the use of nuclear power (Benz, 2013; Ramamurthy, 2011) and their influence on HR and equality in global terms. Considering literature findings regarding science and HR education, the accessible sources are limited and there was no study focusing on developing attitudes towards HR through SSI in science education. In addition, understanding HR is vital for democratic societies (D'sa, 2004). Preservation of these rights is possible by educating individuals who understand and value HR (Flowers et al., 2000). In this sense, it is important to conduct studies for developing attitude and understanding towards HR. The influence of science and technology on HR makes the context of science and technology an essential part of these studies (Brown, 1981; Jennings & Eichinger, 1999). In order to make students acquire knowledge and attitude towards violation of rights which were experienced or might occur due to developments in science and technology, SSI provides the necessary context. In accordance with the aforementioned reasons, this study dwells on the below questions:

How attitudes can be developed in 8th grade middle school students through SSI within the scope of science courses? What are the problems that might be encountered during the implementation? How can these problems be handled?

Method

Research Model

This study, aiming at an in-depth analysis of how can attitudes towards HR be developed through SSI in science courses, was designed as an action research. The purpose of action research is to develop an action by understanding its quality and define a possible problem and solutions in schools or classrooms (Johnson, 2005). This study deals with a group of students who experience a lack of understanding and attitude towards HR. These students have limited knowledge of HR (the number of rights they know is also very limited) and they do not know what some of these really mean. At the same time, their awareness regarding the importance of HR is also quite low. In addition, they have difficulties in grasping the effects of advancements in science and technology on HR and they tend to put forth ideas that are not in accordance with HR (see assessment studies).The teacher and the researcher adopted an impressionistic approach covering constant planning, practice and evaluation in order to solve this problem.

Sample Group of the Research

This study covers 26 8th grade students in total. 14 were females and 12 were males. These students had difficulty in developing an understanding and attitude towards HR. Academic achievement scores of these students for science course ranged from 39.90 to 99.50. The practitioner teacher had 7 years of experience and was willing to participate in the study by stating that s/he had been experiencing this problem with his/her students. The school, in which the study was carried out, is located in central district of the province. The school also has got physical facilities such as computer laboratory in order to enable students to conduct research.

Studies which were Carried out During the Research

Assessment studies.

A two-phase process was adopted for assessment studies. The first phase involves a 3-month period of observation during which students' attitudes and understanding in relation to HR were observed. Observations indicated that students could not make explanations regarding the importance of fundamental rights and freedoms. Moreover, it was seen that they are of the opinion that environmental protection and sustainable development cannot be considered as HR. Furthermore, in relation to organ donation, they suggested that if people are in need of money, they should have the right to sell their kidneys, which does not comply with HR. Majority of students were observed to express only freedoms concerning HR. Second phase involves analyses on attitude scores of students regarding HR.

Forming an expert group

An expert group consisting 14 experts from various fields such as democracy and HR education, SSI, curriculum development, law and nuclear power as well as biology depending on the content of the activities was formed to consult while planning the activities and for validity studies.

Forming validity committee

A validity committee was formed for the study to consult for practices and data analyses. Validity committee includes a science teacher, an expert of HR and a person from expert group depending on the subject. The basic criteria when forming the validity committee was that all three members should be experts in the field. In addition, the science teacher member of the committee should have knowledge of socio-scientific topics in addition to attitude and qualitative research knowledge and that the other member who is the HR education member should have knowledge on attitude and qualitative research knowledge.

Preparing action plan

Action plan was prepared in accordance with assessment studies, literature findings and expert views. SSI which were associated with HR in literature were detected and each unit of science course for 8th grades was analyzed accordingly. Therefore, acquisitions associated with which HR in which unit within which SSI were identified. Validity of the connections built in the program was assessed by experts.

In order prepare activity plans, relevant literature was reviewed for the teaching methods and techniques used for HR education. In this sense, activity plans and projects were prepared based on socioscientific dilemma scenarios, media reports, scientific journals, cooperative learning based on real legal reports regarding HR as well as role-play. Moreover, studies were conducted to sequence the rights based on their degrees of importance when different rights face off against each other. Three dilemma scenarios used in the activities were taken from the relevant literature (Koker, 1996, cited in Ratcliffe & Grace, 2003; Sadler & Zeidler, 2005b; Sürmeli, 2010). Other dilemma scenarios, media report analysis and activities during which legal processes were acted out were developed by the researchers. Expert views were taken for prepared activities. Pilot study was conducted and its functionality was tested. New activities were added to action plan during the implementation depending on the needs. Action plan activities and relevant HR are given Table 1.

Table 1.
Action Plan Activities and Relevant Human Rights

A1: Introduction to the program, its purpose and scope Introduction to fundamental rights and freedoms	A9: Research project Human Rights Dimension Additional Activity Sustainable development	A17: Base Stations-1 Property right, right to communication
A2:Ordering male child, Ban on discrimination, gender discrimination, right to live -1 (embryo's right to live)	A10:Wind power plants (Media report analysis) Right to environmental protection, Sustainable development	A18: Base Stations: We are claiming our rights Property right, right to peaceful enjoyment of property, spiritual and physical right to privacy, right to public welfare and communication (*)

Table 1. cont.

Action Plan Activities and Relevant Human Rights

<p>A3: Job application, Personal data protection, freedom of vocational choice and right to employment, wrongful dismissal protection</p>	<p>A11: Pesticides-Use of Methyl Bromide Right to environmental protection right to live healthily, sustainable development, right to food</p>	<p>A19: Steam power plants-1 Right to environmental protection, right to live healthily, limitations in fundamental rights and freedoms due to public welfare, right to a fair trial (*)</p>
<p>A4: A new step in obtaining health insurance, Right to medical care, personal data protection, right to live healthily</p>	<p>A12: Potable water therapy Right to live, right to live healthily (Comparison)</p>	<p>A21: Global warming-1 Right to live, right to environmental protection, right to housing and property, right to food and clear water, right to peace</p>
<p>A5: A genetic invention, perfect humans Human dignity, ban on discrimination, spiritual and physical right to privacy</p>	<p>A13: Water pollution: Cleaners in the water Right to clean water, sustainable development (for water)</p>	<p>A22: Climate refugees Right to peace, right to live, right to environmental protection, right to housing and property, right to food and clear water (*)</p>
<p>A6: Cloning a dead child spiritual and physical right to privacy, human dignity</p>	<p>A14: Acid rains Right to environment</p>	<p>A23: What are the benefits of recycling? Right to sustainable development (Sustainable economy) (*)</p>
<p>A7: Products with GDO Right to food, food security, right to live healthily</p>	<p>A15: Chernobyl accident research project Right to live, right to environmental protection, freedom of press (Freedom of information)</p>	
<p>A8: Hydroelectric Power Plants-1 Right to housing, right to food, right to environmental protection, sustainable development, respect for common heritage of humanity, property right (*)</p>	<p>A16: Nuclear power plants Right to live, right to environmental protection, right to live healthily – Context of public welfare</p>	

(*) Activities that go on for 2 weeks

Implementation process

Implementation of action plan lasted for 28 weeks. Students were informed each week before the implementation about the activity that was going to be carried out. Thus, students had the opportunity to make researches and collect the relevant information. Moreover, counseling studies were conducted to inform students about how to access reliable sources and information. The researcher recorded the process as the participant observer. Preparation with the teacher, evaluation and problem-solving oriented studies were conducted during the practices.

Data Collection Tools

Written Documents Regarding HR

Documents on activities and projects

Activity documents and project reports of the students were collected as data source each week at the end of the application. These documents were used for acquiring knowledge on the attitudes of all students regarding HR and the development of their understanding along with the determination of the problems they experienced during the development period. In addition, these documents were presented to different researchers during the application period for preventing bias and they were also used as data source for validity studies. Throughout the application, the students were first asked to answer the activity documents prior to the verbal discussion process and the activity documents were collected following the application and were compiled into a data set for analysis.

Teacher and student diaries

The teacher diary was used for being able to see the application process and the problems experienced from the perspective of the teacher and for acquiring information regarding the regulations to be made. Student diaries were used for reflecting the thoughts and emotions of students towards the

applications and for them to record what they learned and the difficulties they faced throughout the process. Thus, the application process was evaluated from the perspective of the students, data diversification and confirming information was acquired.

Human rights attitude scale (HRAS)

Human Rights Attitude Scale (HRAS) was developed in the study and used to reveal the change in attitudes towards HR. A literature review (Atolagbe & Otubanjo, 1984; Diaz-Veizades, Widaman, Little, & Gibbs, 1995; Kehoe & Echols, 1980; Moghaddam & Vuksanovic, 1990), Universal Declaration of Human Rights (cited in Brander et al., 2002), European Convention on Human Rights (cited in Brander et al., 2002), CHR (1997), International Covenant on Economic, Social and Cultural Rights (cited in McChesney, 2000) was conducted to create an item pool in order to develop HRAS. A draft form was prepared containing 67 items based on these theoretical frameworks. The form was submitted to the evaluation of two expert lawyers and eight faculty members for content validity. Afterwards, the pilot study was conducted and exploratory factor analysis (EFA) was carried out based on data covering (614) six hundred and fourteen 8th grade middle school students. After examination, seven items were excluded from the scale and the analysis was repeated. As a result of repeated EFA, it was seen that the scale has three construct which are “Positive attitude towards HR”, “Negative attitudes towards HR” and “Government role in attitudes towards HR” Factor loads of items range from .44 to .82. Total score correlations range from .35 to .81. Cronbach Alpha internal consistency coefficients of the sub-scales of HRAS were 95.74, 89.94, 77.34. These three sub-factors explain 46.98% of the total variance. Cronbach Alpha internal consistency of the entire scale is 96.65.

Camera Records for Application Process (Unstructured observation data).

Verbal and non-verbal data regarding implementation process were recorded completely by using camera records. These data were used for

providing information on the development of attitude and understanding towards HR and for detecting the problems experienced. Moreover, these records were provided for the analysis of different researchers during the implementation process which prevented bias and was used as data source for validity studies.

Data Collection

In the study, data were collected for 28 weeks which were carried out for two classes in six weeks and a class hour in 22 weeks. HRAS was implemented five times in total with one before the implementation and the other after the implementation.

Data Analysis

Qualitative data Analysis of Attitude Development Regarding HR

Analyses were carried out for qualitative data during and after the completion of implementation. Camera records and activity sheets were transformed into written documents during the implementation process and a set of data was created. Set of data was analyzed through content analysis. In this process, rights regarding SSI were identified and relevant connection codes were created. Second phase involves whether attitude development regarding these rights took place directly or through inferences based on the meanings. These results constituted the data to detect development in attitude and understanding and to plan the next step. A sample data quotation from the analysis is given in Table 2.

Table 2.

Sample Quotation from the Analysis Regarding Implementation Process Concerning Attitudes Towards Human Rights

Stu. No.	Human rights connection codes	Sample quotation from human rights connection codes and attitude development
S14	The right to privacy, freedom of vocational choice and right to employment, right to live healthily, genetics based discrimination (+) Positive development. Activity name: A new Step in Obtaining Health Insurance	...Since these are personal details, it will be violation of <u>right to privacy</u> if they are passed on to other people without our consent ... When these details are used by the employer and insurance companies, there will be <u>discrimination</u> because we will pay different premiums. What will those people who cannot pay do? They will not be treated because they cannot afford. The <u>right to live healthily</u> will be dispossessed from us... if they are used while being employed, it will pose a threat to our <u>vocational freedom and right to employment</u> ... <u>These rights should be advocated because they prevent us from being treated unfairly and ensure living a better life</u> ...

After the process was completed, collected data were analyzed once again. In this process, connection codes were created again with the rights that led to development in understanding and attitude towards HR. The connections between these codes were analyzed again. In this sense, the rights that led to development in attitude and understanding were categorized under three groups which are first, second and third generation rights. This categorization is consistent with literature. A sample is given in Figure 1 explaining how this analysis process functioned.

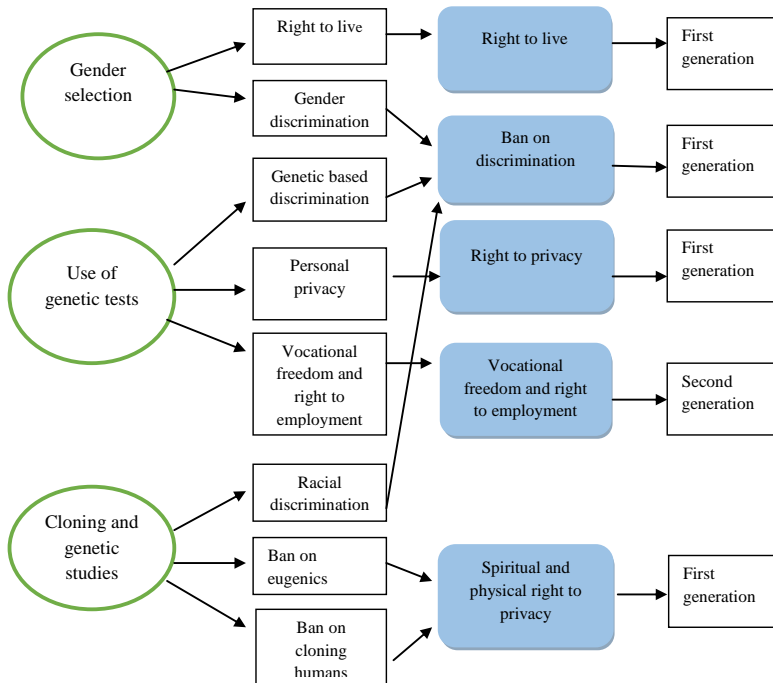


Figure 1. A sample scheme of the attitude analysis process regarding human rights after the implementation.

Quantitative data analysis regarding attitude development towards HR. Quantitative data regarding HR were collected via HRAS. HRAS scores were statistically analyzed using Friedman test and Wilcoxon signed-rank test. These quantitative data were evaluated at a significance level of $p < .05$ using a statistics program.

Data analysis of the problems encountered in development of attitude towards HR. The basic principle of action researches is to detect and solve the problem encountered during the implementation process at the exact time and place it occurs (Best & Kahn, 2006). In this sense, another analysis was conducted on the data to detect the problems encountered during the implementation. This analysis process was conducted in two

phases one of which was during the implementation process and the other was after the completion of the process. Set of data which was created on a weekly basis during the implementation was analyzed through content analysis. In this sense, the detected problems formed the data source of the next phase. After the completion of the implementation process, content analysis was conducted once again over the sets of data for the problems. The problems, were created through content analysis. They were categorized under two groups.

Reliability and Validity Studies During the Research Process

Studies were conducted to ensure reliability and validity during the research process (Daymon & Holloway, 2003; Lincoln & Guba, 1985; Johnson, 2005). Data variation was carried out in the study. Long interaction was ensured and the process was recorded through a camera in order to prevent data loss. Study group was defined in detail so as to ensure transferability. Study results and evidences regarding the deductions are presented clearly to enable comprehension by others. Validity meetings were held during the implementation during which camera records, other records regarding data, data analyses and interpretations were presented to expert review. The researcher questioned his/her role and whether s/he was biased or not. Data set was presented to the review of a human rights expert to calculate encoder reliability (Miles & Huberman, 1994). The lowest encoder reliability regarding weekly evaluations concerning human rights attitude development was found 91% whereas encoder reliability at the end of the process was found 94%. The controversial codes were discussed with experts and a compromise was achieved regarding them.

Findings

Quantitative Data Regarding HR Attitude Development

In order to reveal whether there was a difference in students' scores of HR attitudes, HRAS was implemented five times. In order to see whether HRAS scores showed a significant difference, Friedman Test, which is the

non-parametric counterpart of one-factor Anova (repeated measurements), was conducted as the assumption of homogeneity of variance was not fulfilled. Friedman test results indicated a significance difference between first, second, third, fourth and fifth measurement scores (Asymp. Sig: .00 < .05). Wilcoxon signed-rank test was conducted for determining between which measurements a significant difference exists. Wilcoxon signed-rank test results indicated significant difference between HRAS first and second measurement (z: 4.45, $p < .05$), second and third measurements (z: 4.45, $p < .05$), third and fourth measurements (z: 4.45, $p < .05$), and fourth and fifth measurements (z: 4.45, $p < .05$). Considering rank means and total of difference scores, it was seen that the difference is on behalf of positive ranks. In other words, the difference between first and second measurement is on behalf of second measurement, the difference between second and third measurement is on behalf of third measurement, the difference between third and fourth measurement is on behalf of fourth measurement and the difference between fourth and fifth measurement is on behalf of fifth measurement. Based on these results, it is possible to assert that there is a positive change in attitude scores regarding HR.

Qualitative Data Regarding HR Attitude Development

Findings regarding the development of first generation rights (Personal and political rights)

The study findings indicated that students developed attitudes and understanding towards many first generation rights.

The activities for attitude development towards human dignity aimed at adopting the view that all humans are equal in terms of dignity and no one should be subjected to humiliation and offensive treatment. In this sense, connections were established between a genetic discovery and perfect humans as well as cloning. Ban on genetic experimentation on humans was evaluated by human dignity during these activities. Initially, it was seen that some of the students were of the opinion that such studies could be conducted if people were going to be more intelligent and talented. It was clear that students did not consider the possible negative outcomes and

therefore could not make a proper evaluation by human dignity. An environment where they could discuss opposing ideas were created to make them engage in such an evaluation. Thus, they were made to think over and performed multi-dimensional evaluations.

Written feedbacks received after the implementation confirmed that there was a change in the attitude and understanding. Moreover, students expressed similar ideas in cloning activities which was considered as another indicator of positive attitude acquisition for human dignity.

A connection was tried to be established through embryo's right to live with practices regarding gender selection for the process of acquiring attitude and understanding towards the right to live, a regional connection was tried to be achieved through Chernobyl accident and a universal connection was tried to be achieved including the future generations through global warming. The first connection of this process was established through embryo's right to live. During this activity, it was observed that some of the students were advocating that parents may end the life of the unborn child (embryo) to make a gender selection. This view was rather supported by male students and for having a son. The discussion environment was effective for students to re-evaluate the previous ideas and change them. Students adopted the idea that embryo's life should not be put to an end due to gender selection. Second connection for the right to live was achieved through Chernobyl accident. Students stated that many people's rights to live were violated due to the radiation including the children to be born in the region indirectly. However, it was seen that some of the students claimed that the problem is not the business of others but only the country where it takes place. This finding indicated that universal attitude towards the protection of the right to live was not achieved in all the students. The program needed to be re-organized since universal attitude was not achieved in all the students. Therefore, one of the rights which were emphasized in the global warming activity was the right to live. At the end of this activity, it was seen that students made explanations highlighting the importance of protecting the right to live for all the people around the world as well as next generations.

The right regarding ban on discrimination was handled in three contexts which are gender discrimination, genetic based discrimination and racism.

In this sense, activities based on gender discrimination, genetic based discrimination through use of genetic tests and racism through eugenics were organized. Through these activities, student ideas regarding master race or a gender, practicability of genetic based discrimination, conducting genetic studies to make a race stronger were tried to be changed.

In the first phase of the gender selection activity, it was seen that some of the students agree with the idea of gender discrimination with particular preference of sons. In order to make students evaluate the situation multi-dimensionally, they were made to discuss with each other. Moreover, it is possible to say that students developed an awareness regarding the fact that it is illegal to use medically supported impregnation techniques for gender selection and the practices concerning gender selection were banned within the scope of convention on genetics and biomedicine.

The activities were aimed at creating the idea that any type of discriminatory practices and eugenics were prohibited due to genetic inheritance within the context of genetic-based discrimination and racism. One of the activities carried out in this process was the discussions over conducting genetic practices to produce perfect humans. At the beginning of the discussion, majority of students stated that this practice is an advancement in science and technology leading to economic growth and necessary to be racially superior. Therefore, they did not deem it as a threat initially. Discussion process was observed to have a positive effect on change of such ideas. A sample dialogue from the discussion process is as follows:

-Teacher, I think it should be practiced. I do not think it would have a negative influence on our rights. We would be a stronger country since we would invent it...Other countries would beware of us...(S8)-Do you agree with your friend?

-I do not agree teacher; it is a one sided aspect. We could be those people. Would we be slaves then...No race or nation should engage in such a thing...?(S13)

-I do not agree neither, teacher. Just because they do not have the technology, do underdeveloped countries have to be our slaves...(S11)

After the implementation, it is possible to say that students generated ideas covering all humanity regarding the ban on racism. For genetic-based

discrimination, a connection regarding the use of genetic test for employment as well as health insurance was established. Therefore, understanding and attitude towards genetic-based discrimination and what kind of outcomes it will yield to were tried to be developed based on real event.

Spiritual and physical privacy of the person was first examined within the context of eugenics and human cloning in genetics unit. In addition, this right was mentioned once again during the activities regarding base stations and thermal power plants. Students were provided with the experiences which they may encounter in their daily lives. Within the context of cloning and eugenics, it was observed that students made connections based on concepts of personality, identity and kindred and social acceptance regarding spiritual privacy. As for the physical privacy, they made connections based on possible vital risks and health problems. This situation can be exemplified with the following quotation: “Think of the cloned sheep, it died. It may be ill or disabled when it was born. We may lead to illness in that living being’s body before it was born...It has no identity, an ambiguous existence...who is the mother and father...the right to spiritual and physical privacy will be under threat...” (S20). Connections were also established between the right to spiritual and physical privacy and the use of eugenics and genetic tests. Moreover, it was seen that explanations emphasizing the importance of the right were made.

An attitude and understanding towards expecting privacy for the details of people’s health was tried to be achieved within the context of right to privacy and personal data protection. In this sense, connections were established between the use of genetic tests and employment as well as health insurance. The use of genetic tests was dealt with its influence on the revelation of genetic information, right to employment, right to live healthily, wrongful dismissal protection and right to health care. Thus, the aim was to make people realize that other rights will be influenced if this right is not protected. During the implementation, it was seen that students were able to explain the importance of the rights and which and how rights can be influenced by them through the research they conducted. However, it was revealed that some of the students did not deem legal regulations necessary for the use of genetic tests and their results. Therefore, this right

was examined once again during the process of obtaining health insurance. When students were asked about the necessity of legal regulations, it was seen that they supported such regulations this time. At the end of the activity, students were informed that it is forbidden in CHRB (1997) to reveal genetic information of people. Thus, this situation is under protection via international agreements which highlights its importance.

In relation to right to property, the aim was to achieve understanding and attitude towards the content of the right, its importance and necessity as well as how one can benefit from this right. The activity about hydroelectric power plants was dealt with the right to property along with arrangements regarding public welfare. The activity about base stations tried to engrain the idea of utilizing the property in peace within the context of right to property. Therefore, connections were made about what right to property refers to, what it covers and under which conditions it can be restricted. At the end of the implementation, it was seen that students acquired an understanding towards the right to property and its importance as well as an awareness regarding the freedoms and restrictions that accompany the right to property.

An understanding and attitude towards freedom of press and information was tried to be achieved within the scope of freedom of speech. Through Chernobyl accident, students conducted research and tried to express the importance of being informed and freedom of press as a result of their studies. Relevant explanations are as follows:

When Chernobyl accident took place, initially people were not informed. Many people were harmed due to this prevention... This situation indicates the vitality of this right... (S26)

Right to information: It was prevented due to restrictions on the press. Prevention of this right led to prevention of the right to live and live healthily for many people... (Team Colorful)

These explanations indicate that students developed an awareness regarding the freedom of communication. The second connection regarding this right was established during the activity regarding base stations. The activity involved acting a legal process regarding base stations. During this activity, studies were conducted for prioritization and ordering according to importance between rights to communication, spiritual and physical right to

privacy and right to property. In this activity, students advocated arguments claiming that right to communication is a fundamental right and base stations are necessary for this right. Moreover, in one of the trials, which took place during the activity, a decision was made based on the importance of the right to communication and on behalf of base stations. The decision is as follows:

No precise information was obtained regarding the negative influence of signals omitted from the base stations on human health. In addition, right to communication is one of the fundamental rights of humans which of great importance. It is vital when natural disasters such as earthquakes take place. Therefore, the demand to remove the base stations was overruled (Group 2).

This decision is a remarkable indicator of the importance of right to communication.

The last right, towards which understanding and attitude development was aimed, was the right to fair trial. The connection was established over the steam power plants. It was seen after this activity that an awareness regarding the right to fair trial was raised.

Findings regarding the development of second generation rights (Social, economic and cultural rights)

The study findings indicated that students developed attitudes and understanding towards many second generation rights.

In the study, connections were established with genetics unit for right to live healthily and the right to health care. To this end, the influence of increasing insurance premiums when the person is prone to a genetic type of disease or cancer, which is revealed through genetic tests, was examined. Thus, an awareness and attitude acquisition were aimed to protect these rights. Connections were established with genetic unit for right to employment, vocational freedom and wrongful dismissal protection. At the beginning of the implementation, some of the students stated that employer can use these genetic tests during the employment process which will not have a negative influence on the aforementioned rights. However, it was seen that discussion process had a positive influence on such ideas of the

students. During this process, it was highlighted that employers do not want to hire qualified people so as to abstain from paying much premium and many countries including Britain enacted laws preventing employers from using such tests. Afterwards, the discussions dwelled on why it is important to protect such rights. Oral dialogues during the implementation and written feedbacks received from the students supported positive attitude development.

The program also aimed at developing attitude towards an adequate standard of living which covers adequate food, clean water and food security rights. The activity about GDO foods aimed at making evaluations about supplying adequate food (nutrition) and food security. Some of the students stated that using GDO foods can be supported in order to ensure adequate food supply during the activity. One of the students explained situation with the following words: "...Many people die of starvation in places like Africa. If GDO foods are used, they will be supplied with foods as well...their right will be under protection..." (S13). Some of the students made explanations emphasizing the food security to ban GDO foods.

Students were told that what they expressed was about "food security right". A discussion environment was created to discuss whether this right was important or not. Within the program, connections were made between pesticides-the use of methyl bromide as well as global warming activities and the right to food. Some of the students defended the use of pesticides to supply adequate food during the activity about pesticides-the use of methyl bromide while the other group made defenses based on right to environmental protection and right to live healthily. Global warming activity aimed at developing an understanding and attitude which is universal and cover future generations in terms of right to food.

Connections were established in water pollution and cleaning products activity within the scope of right to an adequate standard of living. This activity aimed at making students acquire an understanding and attitude towards the importance of benefiting from water in a sustainable way and accessing clear water is a right to be protected for everyone around the world as well as future generations. It was observed at the beginning of the activity that some of the students claimed that if people do not have

problem of water scarcity, they can benefit from it in every way they want. It was observed at the end of the process that student ideas changed.

Connections regarding the right to housing were established through HPPs and global warming activities. The first connection in this process was carried out to raise awareness about the right to housing and its importance. The activity involved efforts to develop an understanding and attitude towards the right to housing based on the problems experienced by local people living in those regions. The aim of global warming and climate change activities was to make students acquire a universal understanding and attitude towards the right to housing. In this process, the effects of global warming on this right were discussed within the context of all people and future generations. At the end of the discussion, it was seen that students developed universal ideas regarding the right.

Findings regarding the development of the third generation rights (Solidarity/Collective rights)

The study findings indicated that students developed attitudes and understanding towards many third generation rights.

For the right to environmental protection, connections were established through renewable and non-renewable energy sources, global warming and pesticides-use of methyl bromide. Firstly, the activity regarding hydroelectric power plants had a connection with the right to environmental protection. One other right which was connected by students through this activity was right to environmental protection. One of the students stated the following words regarding the situation: "...it is also about environmental rights. Being environment-friendly and clean indicates that it supports the right to environmental protection..."(S14). Another right which was connected to global warming activity was the right to environmental protection. In this process, students were made to think over global warming and its effects as a whole. It was seen that students developed understanding and attitude towards the importance and the necessity of the right to environmental protection both at present and in the future for the world and the people. For Chernobyl accident activity, students conducted research in groups. One of the rights which they

connected the activity was the right to environmental protection. Within this activity, students were asked to answer the following questions in their studies.

What kind of problems do you think people encountered most after Chernobyl accident? Is it possible to connect these problems with HR? How?

If the problems resulted from this accident are connected to HR, which rights will be affected? Why?

Students were asked to schematize the results they derived from their projects. A sample scheme produced as a result of the implementation is given in Figure 2.

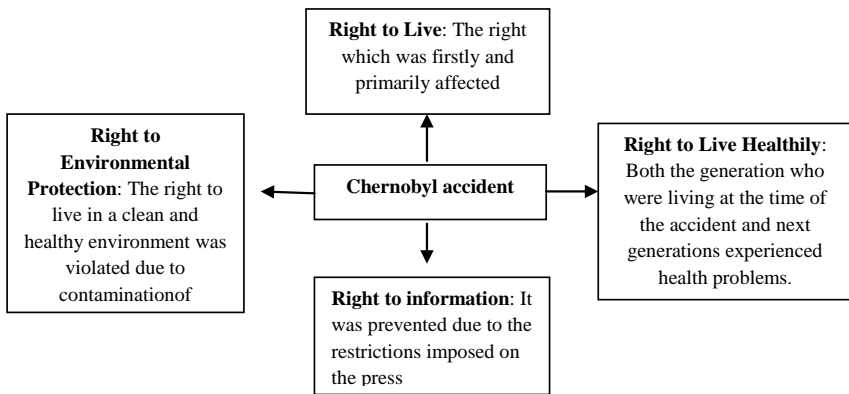


Figure 2. Chernobyl accident human rights scheme (Group 2).

Connections were established with the right to environmental protection while discussing the use of pesticides and recycling. Moreover, the importance of keeping the nature as a habitable place for future generations was dealt with in different contexts. Furthermore, an activity was carried out regarding steam power plants in order to demonstrate what kind of problems may occur when this right is violated and to make students aware of the fact that it is both the duty of the government as a part of constitutions and the people to protect this right. In this activity, a legal

process from Yatağan Steam Power Plant to European court of HR, after addressing the administrative court, was acted by students through role-play. Based on the feedbacks received after the implementation, it was seen that students developed positive attitudes towards the aforementioned situations. One of the students recorded this issue to his/her diary:

We dwelt on the right to environmental protection again with today's activity. What was different is that we also learnt what are our duties to protect this right. We have never proceeded to court of HR before. This time we proceeded. We learnt that our right to fair trial is under protection... (S13).

For the right to sustainable development, the first connection was established through HPPs. In this process, some of the students had problems in meaning-making in relation to this right. Therefore, they conducted research-based studies in groups regarding sustainable development. In order to develop an understanding in relation to sustainable development comprehensively, connections were established through activities dealing with global warming, cleaners in the water, recycling and processed energy sources within the scope of the program. Thus, understanding and attitude were tried to be developed regarding what should be done concerning sustainable environment for sustainable development, sustainability for water which is common heritage of humanity, and sustainable energy which is important for sustainable economy.

Another right towards which attitude development was aimed was the right to respect for common assets (heritage) of humanity in the study. Firstly, during an activity about HPPs, some of the students conducted a study and expressed that another one of the violation of HR caused by HPPs is the right to respect for common heritage of humanity based on the data presented in United Nations Covenant on Economic, Social, and Cultural Rights. This connection was established by only a few students which became a starting point for other students to raise an awareness regarding this right. Students were informed about this right and through the activities regarding water pollution and environmental problems, connections were established with the abovementioned right in order to make them realize how important it is. The purpose of these connections

was to make students realize that the water, historical and cultural assets, natural resources and environment, which are necessary for people to sustain their lives, constitute the common heritage of humanity and they are of crucial importance.

The first connection in the study about the right to peace was established through global warming activity. During this process, students explained that one of the violations of HR as a result of global warming and climate change will be the right to peace. However, it was seen that this association could not be made by all the students. Therefore, the activity named climate refugees was carried out. In this activity, students acted out two citizens from countries one of which was really affected whereas the other one was less affected by this disaster. The citizens from the country which was really affected by this disaster was trying to deal with the problems of finding food, clean water and housing. It was seen as a result of the activity that refugees were causing trouble to enter the country while other country's people react the same way which was a negative influence on the right to peace. During the activity, students from both groups were asked what they felt and what kind of deductions they made. After the activity, it was seen that students developed understanding towards the importance of the right to peace and it is prerequisite for many rights and freedoms.

Findings regarding the problems encountered during the process of attitude development concerning HR

Findings regarding the problems encountered during the process of attitude development concerning HR are given in Table 3.

Table 3

Findings Regarding the Problems Encountered During the Process of Attitude Development Concerning Human Rights

Meaning-making problems regarding human rights	<ul style="list-style-type: none"> • The problem of lack of knowledge • The problems of connections <ul style="list-style-type: none"> Establishing wrong connections Not being able to establish connections
The problem of suggesting and insisting on ideas which do not comply with human rights	<ul style="list-style-type: none"> • Benefit-based sense of human rights • Superiority-based sense of human rights • Individual-national sense of human rights

Considering Table 3, it is seen that meaning-making problems regarding HR involves problems stemming from lack of knowledge and not being able to make connections. The problem of lack of knowledge was one of the most important problems encountered during the program. Students' lack of knowledge regarding rights, particularly right to environment, sustainable development, respect for common heritage of humanity, which are considered third generation rights, led to difficulties in attitude acquisition process. Additional arrangements were made during the process to overcome such difficulties. Another problem encountered during meaning-making was the problem of connecting. These problems of connecting involve wrong connections or no connections at all. Of these, no connection refers to the state of not being able to establish a connection when a student is asked to make a connection between a given situation and the HR. The explanation made during the activity of ordering a male child, "The system would decay. The males would increase while females would decrease" (S1), can be given as an example. In this case, it is seen that the student makes no other connection. Wrong connection refers to not making accurate connections with the given situation and the discussed arguments. Especially in the first activities, when students were asked to make connections about HR, it was seen that they were trying to make irrelevant connections with the rights to education, vote and stand for election. Corrective feedbacks were given and meetings were held with the teacher to eliminate this problem.

The problem of suggesting and insisting on ideas which do not comply with HR was found to involve benefit-based, superiority-based and individual-national concepts of HR. It was seen that students react normally and support the violations of HR when students had benefit-based sense of HR. As for the superiority-based sense of HR, it was seen that students supported gender-based or race-based discriminations in order to become a stronger country and to keep the family name alive. Individual and national sense of HR became one of the most important problems encountered in attitude development process. Students with such ideas experience problems of developing universal understanding and attitudes towards the protection of HR and the prevention of violating HR. In order to eliminate these problems, arrangements were made during the process. An understanding and attitude development towards the fact that these rights are valid for everyone and they should not be violated under any circumstance was tried to be attained in order to make students acquire a universal sense of HR. Connections were repeated over different activities and experiences were provided until the acquisition gained a universal dimension.

Discussion, Conclusion and Recommendations

Study results indicated that understanding and attitude towards many rights and freedoms within the scope of personal, political, social, economic, cultural, and collective rights were acquired in science course in relation to SSI. Relevant literature indicates that SSI such as global warming and climate change, alternative energy sources, steam power plants, HPPs, nuclear power plants, advancements in bio-technology and genetics have an influence on HR or lead to violation of HR. Considering the fact that violation of HR is the main stimulant for HR education (Misgeld, 1994), it is possible to say that SSI constitute an appropriate context to make students acquire the relevant understanding and attitudes. As a matter of fact, United Nations of the World Programmer for Human Rights Education (United Nations, 2012) highlights the fact that various SSI have influence on HR and they need to be taken into account for HR education. Considering the study results in consistency with the relevant literature, it is

possible to say that SSI can be an appropriate context for HR training in science classes.

On the other hand, study results indicate that a global understanding and positive attitude towards the idea that many rights and freedoms should be protected for all and future generations were developed; and an awareness regarding violation of rights and global problems was raised. When these findings are evaluated within the scope of theoretical information in relation to HR training, it is possible to say that practices serve to realize the objectives of HR training. Within the objectives of United Nations Decade for Human Rights Education (United Nations 1995-2004), the purpose of HR education refers to developing the necessary knowledge, skills and attitude which are needed to create a global HR culture (cited in Banks, 2002). Amnesty International (2002) and UNESCO (2002) underlined the importance of developing respect for HR and freedoms through knowledge and attitude development while referring to the purposes of HR education. Reardon (2010) states that the main purpose of HR education is to educate responsible citizens who are aware of global problems and contribute to respect for HR. Tarrow (1990) also asserts that the main purpose of HR education is to raise awareness regarding the rights and the responsibilities. Shiman (1999) emphasized the fact that HR education should make people acquire a universal understanding for respect about rights and violations whereas Tibbits (1996) underlined the importance of conducting HR education through a global perspective. Various researchers (Flowers et al, 2000; Lister, 1984) supported HR education which shows parallelism with the acquisitions carried out in this study.

It is also possible to evaluate teaching-learning aspect of the study within the literature findings concerning HR education. During the process of developing attitude and understanding towards HR, discussions (small groups or whole class), media report analysis, cooperation based learning, project and role-play methods were employed while dilemma scenarios, real life situations, media reports and legal processes were recorded as well. It is possible to say that the arrangements and the class culture created for teaching-learning process were qualified enough for HR education (Flowers et al, 2000; Ratcliffe & Grace, 2003; Osborne & Ratcliffe, 2002; Amnesty

International, 2002; Brander et al, 2002; Levin-Goldberg, 2008; Lister, 1984)

It was stated in the study that there were certain problems of meaning-making about HR; and suggesting and insisting on ideas which do not comply with HR. Meaning-making problems about HR is a negative reflection of lack of knowledge about HR. The lack of knowledge about HR has a direct influence on ideas about HR (D'sa, 2004); and even some teachers and pre-service teachers experience this problem (Eastman, Martin, Dawe, Gaulart, & Dilon, 1989). Peter D. Hart Research Associates state that when people, who lack knowledge and understanding about HR, are informed, they become eager to learn more and develop positive attitude (cited in Banks, 2002). Suggesting and insisting on ideas which do not comply with HR are indicative of the fact that students develop superiority-based and individual-national sense of HR and insist on them. In this sense, it was seen that some of the students reacted the violation of HR normally and had the tendency to protect the HR not globally but individually or nationally. To Weissberg (1974), even if people support protection of HR, they may deny these rights when they contradict their beliefs and ideas. Considering the role of cultural structure in forming beliefs, values and knowledge (Donnelly, 2013; Herder, 2002), it is possible that cultural structure has an influence on this problem. For instance, in the gender-based discrimination activity, initially discrimination on behalf of sons was supported which may stem from the relevant dominant social belief.

Study results, which are supported by literature results as well, indicated that many fundamental rights and freedoms can be developed in students through SSI in science courses. However, the study results should be evaluated within certain limitations. These results are only valid for the participants of this study and they cannot be generalized. Studies can be conducted with different grades or with larger samples to obtain comprehensive information regarding the situation.

Notes

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