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Education for Sustainable Development through International Collaboration. A Case Study on Concepts and Conceptual Change of School-Students from India and Austria on Gender Equality and Sustainable Growth

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Abstract: Dealing with the great challenges of the 21st century requires far reaching changes in the lifestyle and perceptions of humans to ensure an appropriate quality of life for all, now and in the future. To provide people with the necessary competencies, the UN initiated the Education for Sustainable Development (ESD) program. The two-year research-education, cooperative project 'AustrIndia-4QOL' aims to contribute to the goals of ESD. It is based on a collaboration between students from schools in Austria and India on the topics of quality of life, sustainability and global justice. The purpose of this particular case study is to explore the effects of a weeklong face-to-face collaboration in the final part of the AustrIndia-4QOL project. Therefore, it is examined whether or not Austrian and Indian students' concepts regarding the Sustainable Development Goals 'Gender Equality' and 'Decent Work and Economic Growth' change as a consequence of encountering differing perspectives. Short texts written by the students at the beginning and at the end of this collaboration, according to guiding questions, form the basis for a qualitative content analysis. The findings illustrate that the students' awareness increased and their evaluation of topics related to the discussed sustainable development goals changed.

Keywords: education for sustainable development; international collaboration; gender equality; quality of life; conceptual change; case study

1. Introduction

The great challenges of the 21st century urgently require far reaching measures on a global scale to ensure an appropriate Quality of Life for all humans now and in the future. Nevertheless, sustainability can only be achieved, if people are willing to (re-)orientate their individual lifestyles towards this aim. The UN Decade for Education for Sustainable Development (ESD) from 2005 to 2014 and in succession the Global Action Program on ESD, are an attempt to reach this aim. ESD is seen as a key instrument for achieving the 17 Sustainable Development Goals (SDGs), defined in 2015 by the UN and describing major development challenges which are fundamental for the survival of humans [1]. ESD has the objective to provide learners with the knowledge, skills, values and attitudes for attaining a sustainable lifestyle [1–3]. It must be taken into consideration that environmental knowledge alone does not automatically lead to behavioral change. Among others, collaboration competency is seen as one of the necessary key competencies required to deal with the complexity of global challenges [1,4,5].

The two-year research-education cooperative project 'AustrIndia-4QOL' brought 57 teenagers from an Indian high school and 46 teenagers from an Austrian high school around the age of

16 together to jointly perform research on the connection between quality of life and sustainability in a research-based moderate constructivist learning setting. This offers from a scientific point of view, the opportunity to investigate if this collaboration of students from different socio-cultural backgrounds provides a suitable approach for successfully promoting ESD. While the collaboration was mainly processed with the help of social media, this particular study provides insights from a face-to-face collaboration with 10 Indian and 22 Austrian students, which took place in Austria in the final part of the AustrIndia-4QOL project. Prior to this face-to-face collaboration, the students decided to focus on the topics of gender inequality and the apparent tension between the economy and the environment. These issues are in line with the fifths and eighth SDG [6]. Working with each other on topics affecting their real lives, the results deliver an authentic insight into the concepts of Indian and Austrian students and the change of their concepts due to this collaboration.

Although prior research enables insights into existing concepts about topics in the social sciences, there is still a lack of research about the change of these concepts [7]. To facilitate far reaching changes of existing concepts, the potential of collaborative learning settings is stressed by several studies [3,8–12]. However, when conducting an international collaboration, caution has to be taken to avoid perpetuating dependency-relations between the Global North and the Global South [13–20].

In this article, the theoretical framework is explained in more detail and the methodological implementation of the project is described. The presented results illustrate that this collaboration encouraged students to modify their initial concepts.

2. Conceptual Change through International Collaboration

Conceptual change research offers extensive insights into processes connected with the natural sciences. Today's conceptual change theories (for an overview see [21]) frequently share the idea that learning is understood as a constructivist process of restructuring non-scientific concepts towards concepts which meet or come closer to the scientific state of the art knowledge [22]. Education settings in the natural sciences built on conceptual change theories, according to many studies, seem to be more successful in comparison to traditional learning settings [23,24]. Over the past years, these findings have influenced learning settings of social sciences as well (e.g., on concepts about the environment [25,26] or matters of sustainability [27]). The scientific evidence demonstrating the change of such social sciences concepts, however, is still inadequate [7]. Efforts to provoke a conceptual change in social sciences topics face a number of challenges. Different than in the natural sciences, for example, the concepts in the social sciences often differ depending on the theoretical background of the scientific disciplines. The necessity in the social sciences to look at topics from a systemic and multidisciplinary point of view thus often overstrains learners [7,24].

The situation becomes even more complicated in the context of the Great Challenges of the 21st century. First, most, if not all, environmental challenges require social decisions based on processes out of natural sciences. Second, tackling these challenges requires far reaching changes in the lifestyle concepts of individuals and societies and the empowerment of humans to act on the local as well as on the global level [1,28,29]. The question remains as to whether such complicated and also deeply rooted concepts can be changed at all and if, how? According to transformation education research, learning processes cannot be steered or controlled by the educator [30,31] but rather supported by participative learning settings that enable personal engagement and include a process of reflection [32,33]. Learning as an intrinsic process has to be accompanied with the paradigm of transformation in the context of ESD [34]. Therefore, 'recognizing the interconnectedness among universe, planet, natural environment, human community and personal world through critical reflection, holistic approaches and positive relationship with others' is required to enable a transformation [33] (p. 126).

To enable a far-reaching conceptual change, social constructivist (e.g., [35]) and participative approaches (e.g., [36]) on conceptual change require learning to be seen not only as a cognitive process but also to put the focus on the social context as well. Furthermore, learning includes not

only cognitive but also metacognitive, affective and motivational aspects and happens in a complex socio-cultural context [24,37,38]. Critical discourses with other learners can contribute to individuals questioning their own non-sustainable actions [31]. For this reason, discourses in small groups are essential for successful learning [3,10–12,15]. A collaborative learning setting enables learners to continuously change their position between acting and observing. By observing, one can take a more objective position and this helps to modify her or his own concept. Due to critique from others, learners start to develop more abstract and complex concepts. This observation applies even for learners who are already on a relatively higher level of understanding and even when learners themselves do not recognize the value of collaboration [8,9]. Critical for success is that the interaction takes place with people who have different ideas, views, values and perspectives in order to enable 'transformative disruptions' [12] (p. 385).

Having this theoretical framework in mind, the question arises how far a collaboration between school students from different socio-cultural backgrounds could be a suitable approach to lead the participants to questioning their own point of view and, therefore, to modify their initial concepts. Expectations of international collaboration in general and in school partnerships are often very high [14,39,40] but the reality can be very different. International school partnerships with partner schools from the Global South in particular frequently run the danger of reinforcing existing clichés and stereotypes among the participants. A classification of one side being humanitarian and generous and the other group being poor and helpless may be supported, leading to a constant updating of global dependency relations [13–15,18,19,41]. Disney [20] (p. 7) even emphasizes the danger of 'epitomizing a new form of colonialism' in which the dependency of the South is perpetuated. Teachers need to be sensitive towards the tendency of western students to see the world from a perspective of superiority [14,18]. Against this background, the Intercultural Centre in Vienna [42] recommends for international school partnerships not to learn *about* each other but rather to learn *with* each other. Both schools need to hold an equal position within the project [16,20]. Collaboration has to be focused on negotiation and discussion and based on 'reciprocity, equality and mutuality' [19] (p. 923).

Keeping these recommendations in mind by designing the learning-settings for the research-education cooperative AustrIndia-4QOL project, we hypothesize in detail that the collaboration between students from Austria and India

1. raises the students' awareness that the topics gender equality and the apparent tension between the economy and the environment influence their personal quality of life and
2. leads to a change in the valuation of matters connected with these two topics.

3. Methods

3.1. Project Implementation and Study Samples

Months before the actual project started, general information about the central project ideas was presented to Austrian as well as to Indian students and they were asked whether they would be interested in taking part in the project. It quickly became apparent that the students were not only willing to participate but enthusiastic about the chance to take part in an international collaboration with students from totally different socio-cultural backgrounds. Additionally, they all voluntarily agreed on data collection for scientific research. Without their enormous engagement, it would have not been possible to implement this project.

The AustrIndia-4QOL project was divided into two parts. During the first part, the students designed questionnaires and collected and evaluated their own data about the similarities and differences between the quality of life concepts of youth in these two countries. The results out of their research were presented and discussed via the social media platform 'Facebook.' This process was conducted over a period of three months.

In the second part, ten Indian students (seven girls and three boys) of the Day Star School (DSS) [43] in Manali in Himachal Pradesh had the opportunity to visit their project partners at the Gymnasium Schillerstrasse (GYS) [44] in Feldkirch in the western part of Austria. The GYS is a state operated high school and the DSS an English-speaking, privately-operated school, which prepares students for A-levels. According to Mr. Paul Elias, the former headmaster of the DSS who supported this project and was responsible for the travel organization of the Indian students, the ten Indian students originate from different religious and social caste groups (the Indian caste-system still has some influence on daily life in this region). In financial terms, all these families are rather well-off. They were able to bear the travel costs on their own. Most of the 22 Austrian students come from middle-class families. They belong to the 46.3% [45] (p. 30) of Austrian teenagers in their age group who attend a higher secondary school which prepares them for the school-leaving examination ('Matura') which is a precondition for further studies.

The students were all around the age of 16. This age can be seen as 'a current "blind spot" of investigations' in the context of conceptual change [7] (p. 301). At this stage of life, teenagers start to participate in formal democratic decisions, become more emancipated from their parents and increasingly occupy themselves with thoughts about their own future. Therefore, it seems particularly interesting to focus on this age with conceptual change research [7].

The students are from the two comparable small towns Manali with approx. 43.000 inhabitants (sub-district Manali) [46] and Feldkirch with approx. 35.000 inhabitants or the surrounding areas. In the following, the terms 'Indian students' and 'Austrian students' are used for the teenagers who participated in this project. When interpreting the collected data, the provincial background of the students, as well as their education level and financial background must be considered next to the small sample size.

People from India represent no classical migrant group in the western part of Austria and personal contacts of the Austrian students with people from India are unlikely to exist. Due to Austria's minor presence on a global scale, it can be assumed that the Indian students are hardly confronted with medial reporting from and about Austria.

For all ten Indian students, it was the first journey outside India. A lot of persuasive efforts by representatives from the Indian and Austrian school and from the Institute for Geography at the University of Innsbruck made it finally possible to get the Visa for the Indian students. The need of the necessary documents to apply for a passport in advance made it impossible for a few more interested students to take part in the project. These challenges and the high financial burden for the involved Indian families are responsible for the small sample size of this survey. During their ten days in Austria, they stayed with the families of the Austrian students. This made it not only possible to reduce the financial costs but also to enable the Indian students a direct insight into the lifestyle of their project partners.

According to the ideas of a moderate constructivism, the students could choose which quality of life topic they would like to work on in the second part of the AustrIndia-4QOL project and connect this topic with sustainability. With the help of the social media platform 'Facebook' a topic finding process was initiated in advance of this face-to-face collaboration. The participants reached an agreement on the two overarching topics 'gender inequality' and the 'tension between economy and environment.' With their choices made, the students laid a focus on the SDG number five: 'Achieve gender equality and empower all women and girls' and on the SDG number eight: 'Promote inclusive and sustainable economic growth, employment and decent work for all' [6]. For the common workshops in Austria, learning settings were tailored to these two topics with the focus of enabling an active participation of the students and encouraging intensive discussions between them. To enhance a learning process by dealing with contradictions and dilemmas [15,35], methods such as dilemma discussions [47] and mysteries [48] were chosen. Applying the latter method, small groups of students structure given information (short texts, diagrams, pictures etc.) in order to answer a key question. Aside from the workshops at school, additional inputs were given by external experts during various excursions.

During the topic finding process at the beginning, as well as later during the workshops, a special focus was given to the contribution of all teenagers in order to support a collaboration as equals. Decisions had to get the approval of all students. Additionally, the students from Austria and India were separated several times in succession to the workshops to enable reflection phases within their own groups. Thereby, the students had the opportunity to express challenges they perceived during the workshops and to discuss possible solution approaches.

3.2. Data Collection and Analysis

To gain an insight into the students' concepts as well as an insight into possible changes of these concepts a pre- post-test design was developed for this survey. For both topics two guiding questions were given to the students and they had to write one text with approximately 200 words for each topic at the beginning and at the end of the collaboration.

When interpreting the results of this case study, the small sample size has to be considered. A mixed methods design was chosen for the data analysis in order to combine the strengths of both quantitative and qualitative approaches in a single research design. The quantitative information helps to get an overall impression of the effects of the collaboration and the qualitative information provides a deeper insight which additionally underpins the quantitative results. Therefore, the statements were analyzed following the criteria of a qualitative content analysis [49,50] by using the software MAXQDA. The initial coding followed deductively determined categories that were chosen by the authors in advance according to the guiding questions given to the students. For example, in case of the topic 'gender inequality,' the students' statements about their personal experiences with this issue were assigned to one of the four categories: 'no inequality,' 'minor inequality,' 'rather inequality' or 'inequality.' Comparing the quantitative distribution of the statements among the different categories between pre- and post-test enables to see overall patterns of the effects of the international collaboration on the participating group of students. As a second step, the answers were qualitatively analyzed in more detail and further categories were developed inductively in order to specify the forms of gender inequality as well as the environmental problems mentioned by the students. Two researchers performed this analysis independently and they merged their categories afterwards. To ensure the validity, the coding of the statements of all 32 students was done independently by these two researchers and compared afterwards. Some minor differences were identified, discussed and finally reconciled. Additionally, the meanings of unclear statements were clarified by direct request.

To enable a deeper insight into the students' concepts, sample quotations of the students have been cited next to the results of the quantitative analyses. Obvious spelling and grammar mistakes were corrected for better readability and the statements of the Austrian students were translated into English. An anonymized code is used instead of the student's names. Thereby, 'IN' signifies an Indian student and 'AT' an Austrian student. The last letter of the code provides information about the sex ('f' signifies a female and 'm' a male student). For an additional insight into the specific response behavior in the pre- and post-test of each single student, see the figures in the Supplementary Materials.

4. Results and Discussion

4.1. Students' Concepts of Gender Inequality

To get an insight into the student's concepts of gender inequality and possible changes of these concepts, the following guiding questions were given to the students:

A) *What **personal experiences** have you had within your family, your circle of friends and in your personal environment regarding issues of gender inequality?*

B) *How do you evaluate the situation **in your own country** in general regarding issues of gender inequality?*

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(B) *How do you evaluate the situation **in your own country** in general regarding issues of gender inequality?*

By analyzing the students' statements in the pre-test three main points can be determined.

1. The idea of gender equality in general is clearly supported among teenagers [51]. While seven out of the ten Indian students reported perceptions of gender inequality in their personal surrounding ('rather inequality' and 'inequality') this is the case for only eight out of the 22 Austrian students (Figure 1). These differences correspond with the different ranks of these countries within the 'gender inequality index' of the United Nations. Austria occupies rank 14 and India occupies rank 125 out of 188 countries [52] (pp. 214–217). Their descriptions are mostly limited to perceptions they made in their social environment but four Austrian and three Indian girls even mentioned specific personal experiences.

'There are some boys who believe they have a greater value and I can often hear comments like "women should stay in the kitchen" and "girls are not capable of anything"' (AT12f). 'The discrimination I felt was about going out to roam around. Boys are always allowed to roam around but girls cannot go out after 6'. (IN01f)

2. Despite the high number of reported cases of gender inequality, it is surprising that seven out of the ten Indian students and 13 out of the 22 Austrian students argued that there is no or only minor gender inequality in their country nowadays (Figure 2). 9 of the Indian students and 7 of the Austrian students emphasized the point that progressive changes have occurred in their country.

'But as development is taking place, our society is more exposed to equality of gender' (IN10m). 'It is difficult to determine specific differences between men and women in everyday life because equality has reached an advanced stage in Austria already'. (AT19m)

Gender inequality is sometimes seen as a problem of the past. The limited observations and awareness for still existing deficiencies is in line with several other studies [53,54].

3. A deeper look into the described manifestations of gender inequality shows clear differences. Most of the Austrian students (19 students) referred to occupational disadvantages such as lower income and less career opportunities and four of the Austrian girls highlighted the double burden of women with families and jobs.

'Women still earn less compared to men and have less chances to get a promotion because it has always to be worried that they drop out due to pregnancy' (AT03f). 'Can I be a mother and a respected architect in future?'. (AT14f)

On the contrary, eight out of the ten Indian students stressed the lower status of women in society and a lack of personal freedom while seven students emphasized fewer opportunities for education. Four Indian students even mentioned violence against women or the dowry system as well as the strongly connected problem of selective abortion of female fetuses.

'And one big thing is still surviving in our place. That is the dowry system. The bride's family is demanded huge amounts to be given to the bridegroom's family. So, people expect only male children to be born in their families. People think it is a burden to have a girl child. They also think it is due to their sin they have a girl child in their families. Therefore, abortion is done in some cases'. (IN02f)

4.2. Changes in the Students' Concepts of Gender Inequality

By comparing the pre- and post-test, three changes in the students' concepts can be shown.

1. More students (9 out of the 10 Indian and 15 out of the 22 Austrian students) referred to specific cases of gender inequality in the post-test ('rather inequality' and 'inequality') than in the pre-test (Figure 1).

2. Due to experiences of the Indian students while in Austria, these students identified even stronger perceptions of inequality in their own country during the post-test. The Indian students observed that women in Austria have more options on the job market as well as in leisure activities compared to women in India. In the post-test, only two of them described India as a country in which gender equality ('no inequality' and 'minor inequality') is given (Figure 2). All Indian students referred to personal observations they made in Austria.

> *'Here my hostess is the one who every day goes out for her hobbies like singing, dancing and acting but we in our place are not allowed to go out in the night for something, generally it is not safe'. (IN04f)*

Although 16 of the Austrian students rated their country differently in the post-test, their overall rating remained almost constant (Figure 2). Information given by the Indian students about the situation in India was mentioned by 18 of the Austrian students in the post-test. Personal experiences also played an important role in the discussions between the students during the workshops. The Austrian students became, on the one hand aware, that things they have taken for granted are by no means natural all over the world and they came to the conclusion that Austria is advanced compared to India in terms of gender inequality.

> *'Even if Austria comes off badly in statistics in an international comparison my subjective feeling is that the situation is better when compared with India. A lot of jobs can be done by women here which would be unimaginable in India'. (AT19m)*

On the other hand, they began to actively seek situations that demonstrate gender inequality in their personal surrounding and in their own country.

> *'My personal experience regarding gender equality as well as my ideas about my future plans didn't change. Nevertheless, I got a different perspective of this topic, inter-alia because of the intensive involvement during writing my work. Therefore, I became aware of many fields in which women are treated with discrimination, such as payment for a job or performing additional work in the home'. (AT22f)*

Obviously, the danger of building simple generalizations about the situation in the other country still remains but these new pictures gathered from personal experiences and first-hand reports can be seen as far more realistic compared to pictures students gather through other sources such as mass media. Some students even wrote down explicitly that the collaboration led them to change their viewpoint.

> *'The exchange with the Indian students gave me a lot of additional information which changed my point of view. [. . .] I was not aware that also in small villages / towns in India there are many people who change their mind and try to provide the same education and career opportunities for their daughters'. (AT15f)*

3. While the above-mentioned manifestations of gender inequality of the pre-test are picked up again in the post-test by both groups of students, the Indian students now mention inequalities regarding job opportunities to a higher extent (eight out of ten) as well. This topic was discussed intensively among the students during the workshops.

> *'In Austria, we can find woman conductors, waitresses, cashiers (IN05f). I saw some women driving the bus but in India no woman drives a bus because they are not allowed to do so. It is considered as shame'. (IN08f)*

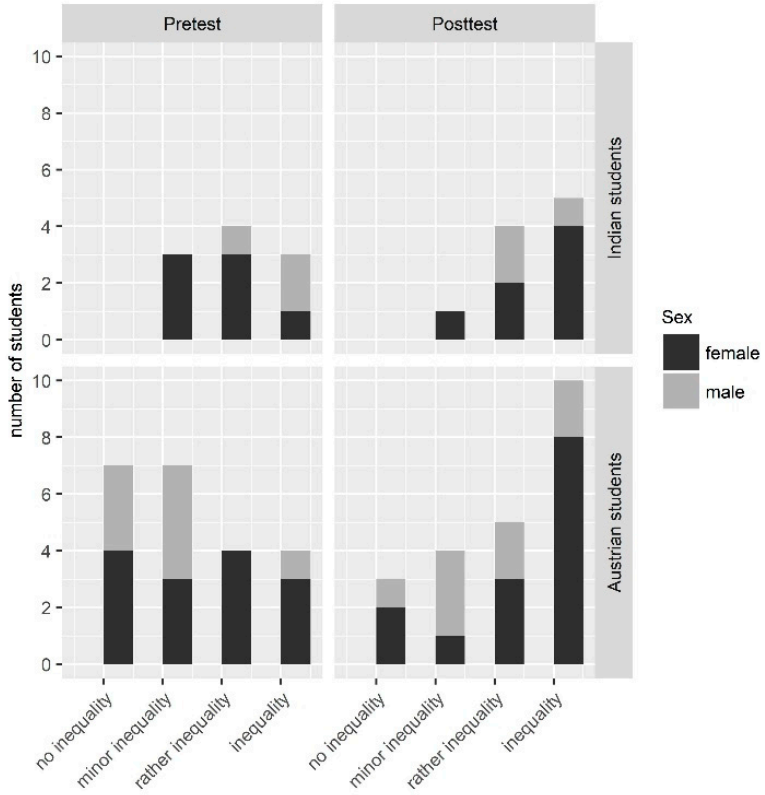


Figure 1. The students' awareness regarding gender inequality in their personal surrounding. Indian students: N = 10; Austrian students: N = 22.

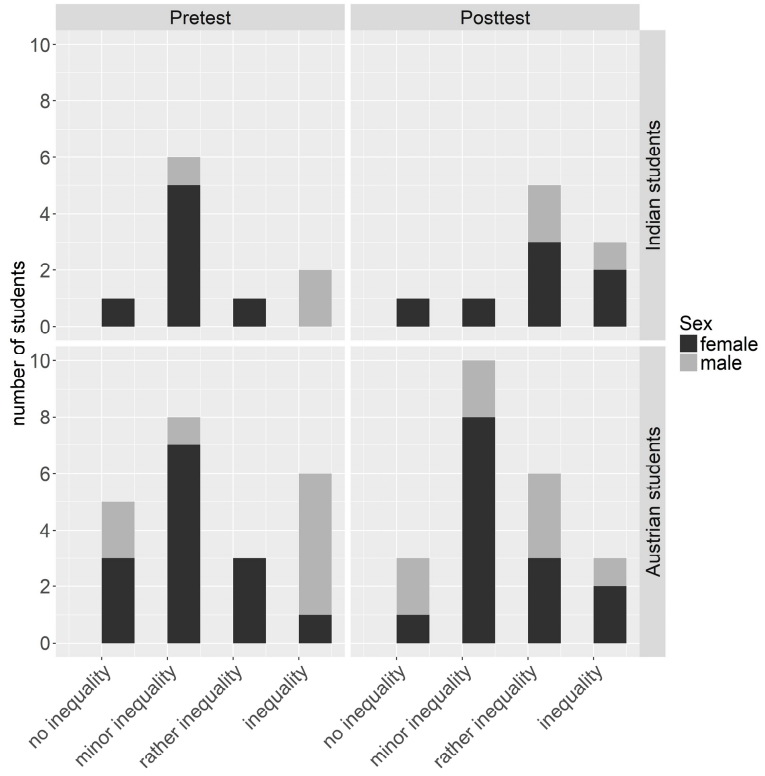


Figure 2. The students' evaluation of their own country in terms of gender inequality. Indian students: N = 10; Austrian students: N = 22.

4.3. Students' Concepts of the Relationship Between Economy and Environment

To get an insight into the students' concepts of the relationship between economy and environment and the changes of these concepts, the following guiding questions were given to the students:

A) *In his speech alongside the climate conference in Paris 2015 the Indian Prime Minister Modi stressed that the poor countries cannot be blamed for the actual climate change and their pursuit of economic development must not be neglected [55]. How do you personally evaluate this statement?*
B) *Are there environmental problems due to economic development which have a direct negative impact on your personal life? If yes, specify the impact!*
C) *If there are negative impacts: Are there personal possibilities to act in order to reduce negative impacts on the environment?*

By analyzing the students' statements in the pre-test three main points can be determined.

1. The statement of Prime Minister Modi was evaluated controversially by the students. Approximately half of the Indian and Austrian students agreed ('rather agree' and 'agree') with this statement (Figure 3). The clear disagreement of half of the Indian students is surprising when considering the high portion of the population in India, which are suffering due to their low economic development.

> *'I don't agree with the Prime Minister of India because I think that India is also one of the countries which is polluting our environment. We should not blame other countries. Compared to India other countries are clean'. (IN03f)*

2. When teenagers are asked about relevant factors for their quality of life, environmental aspects are hardly mentioned [56–58]. In this particular survey, the students mostly mentioned different environmental problems due to economic development but none of the Indian students and only two of the Austrian students believed that these problems already have a negative effect on their personal quality of life (Figure 4).

> *'I cannot say if my generation will directly perceive the impacts of environmental problems—I don't hope' (AT03f). 'Manali is not so much industrialized. Therefore, one can't see a direct impact due to climate change or other problems now'. (IN07f)*

By going into detail, differences between the Austrian and Indian students can be determined. While the Austrian teenagers mostly refer to climate change and the pollution of the seas (12 out of 22 students) to have a negative impact on humans in the future, the Indian teenagers most often mention the scarcity of resources next to climate change (three out of ten students).

3. Nearly all students (28 out of the 32) agreed that they have the opportunity to act in order to reduce negative impacts of economic development on the environment. To avoid waste (12 students), to reduce car travel and to encourage sensible energy consumption (9 students each) are specific actions the Austrian students suggest most frequently. The Indian students most often referred to collecting and recycling of waste (6 students).

> *'My family for example renounces on plastic as far as possible, even plastic waste is not stored in plastic bags. Also, the car is only taken if really needed and if there is no public bus going in the right direction on time' (AT20m). 'First of all, we should personally segregate our waste from house into wet and dry waste, then it would be easy to treat our waste. As an individual, our responsibilities are to not litter around'. (IN07f)*

4.4. Changes in the Students' Concepts of the Relationship Between Economy and Environment

By reviewing existing literature, Sternäng and Lundholm [59] show that scientific knowledge is hardly used by students for the decision-making in terms of a dilemma between economic growth

and environmental protection. Instead, their decisions are mostly based on personal values and emotional arguments. But how far does this international collaboration lead the students to change their concepts?

1. The statement of the Indian Prime Minister Modi gained higher approval among the Indian teenagers (Figure 3). Seven out of ten Indian students agreed ('rather agree' and 'agree') with this statement in the post-test. After visiting a region with one of the highest living standards worldwide, eight of the Indian students stressed the higher negative impact on the environment of the developed countries in general and four of them demanded better economic possibilities for developing countries at the end of the project

> *'I as the individual agree with the Prime Minister of India because developed countries are creating more emissions and the western countries laid the development of industries and also used most of the resources. Now it is difficult for the developing countries which are dependent on the industries and they are much dominated by the countries in the west. We need to promote global justice for developing countries so that they do not match with the other countries and it will help in making the world a better place' (IN09m). 'The first world countries are also responsible for the climate change of the whole world due to their large carbon footprint. And the developing countries are dominated by the climate change'. (IN01f)*

One of the Indian students explicitly expressed his critique about the experienced lifestyle in Austria.

> *'I think that people in the west have a higher standard of living and they need to rethink and change their lifestyle so that they look after quality of life and not higher standard of living. It will connect to the eastern countries too as it will become easier for them to develop and not to think about the carbon concentration. I think it's always the people who need to be blamed, every single one of us but it's more impacted by the western countries as they have more demand and higher standard of living. They want facilities though they don't use them'. (IN10m)*

20 out of the 22 Austrian students expressed their general understanding for the desire for economic development and four explicitly referred to information they gathered from the Indian students concerning economic problems in India. Nevertheless, 13 students disagreed or rather disagreed with Modi's statement. The average assessment of the Austrian students concerning the controversial statement remained almost constant, although most of them changed their individual rating. Findings by Miyake [8] may offer an explanation here: She points out that a collaboration in order to find a solution for a specific problem leads to different mental models. The participants have the impression that they worked out a common solution together and are not aware that their explanatory approaches and results differ in fact. The interaction causes an individual conceptual change based on the different concepts at the beginning.

The seven Austrian students who agreed with the statement of Prime Minister Modi to a higher extent in the post-test, placed greater emphasis on the question of global justice compared to the pre-test and they partly referred to information they got from the Indian teenagers.

> *'Together with the Indian students we had a debate about the topic economy–environment. In this context they brought up the bad living conditions they face during winter time and that they sometimes have no electricity for several days'. (AT22f)*

The eight Austrian students who had a stronger disagreement with the statement from Prime Minister Modi in the post-test argued that global problems affect all countries and, therefore, all have to contribute to possible solutions. Additionally, some of them referred to facts they learned when performing their own research, during the workshops, or during a lecture about climate change with a professor at the university.

'After intensive discussions with my guest from India I became aware of the exploitation of developing countries, inter alia India, through Western powers to a higher extent and I could better understand the situation of India. The Western nations gained an economic advantage by polluting the earth, which had a global impact. Nevertheless, I still hold the opinion that a complex issue like this cannot be dealt with according to the principle of 'an eye for an eye, a tooth for a tooth,' because this will cause global harm and at the end of the day we are all in the same boat' (AT04m). 'Reportedly, India is planning to double the mining and heating of coal in order to make electricity accessible for the whole population by the year 2019. Considering [. . .] the actual climate situation, this plan of the Indian government must not be approved of at all'. (AT11m)

The responsibility of the Global North is partly attributed to mistakes of the past. The fact that a sustainable and fair development on the global level would primarily imply a considerable reduction of resource consumption of people of the Global North and therefore a change of their own lifestyle, was not mentioned by the Austrian students. Instead of taking the individual economic footprint into account, some of them argued with the resource consumption of nations and pointed to the negative environmental impact of populous countries.

'For me the statement of the Prime Minister seems arbitrary. It sounds as the Prime Minister thinks that India would have the right to produce the same amount of greenhouse gases as other nations did in the past' (AT19m). 'The development in the western world caused current problems wherefore one can understand Modi's statement. But the Indian Prime Minister cannot simply state that India is not responsible as well. Due to the rapid economic development, developing and emerging countries share an increasing responsibility. Additionally, all people on the planet will feel the consequences of environmental destruction. Therefore, nations like India with their high population have to be aware of their responsibility'. (AT15f)

2. Due to the intensive discussions of environmental problems caused by economic development, the students realized to a higher amount that environmental problems caused by economic development already have an impact on one's personal life (Figure 4). Rising awareness is essential for ESD [60] and a precondition for the willingness to change individual behavior [61,62].

Negative effects of climate change were mentioned most often in this context. The high awareness of this specific topic is consistent with a survey conducted by Chhokar et al. [63] with Indian students, as well with survey results from Austria [64]. A lecture during the week at the University of Innsbruck about this issue may also have left a lasting impression on the students. This was followed by the problem of waste and the connected pollution of the seas.

'If temperature raises global 'only' two degrees, this can already have a massive impact on our whole life. Some skiing resorts already currently experience the consequences of global warming' (AT20m). 'Even by walking along a beach on holidays and the beach is polluted with plastic and other trash one recognizes the impact of the pollution of the seas' (AT03f). 'A huge amount of waste is already in the rivers and into the sea and is polluting drinking water and fishes. Yes, some people have lower standard of living because of this even nowadays'. (IN01f)

3. The discussions at school and additional inputs at a hydro-energy plant, a water treatment plant, as well as a lecture at the university led to greater knowledge of this topic. This observation is reflected in the rising number of arguments the students mentioned to explain their concepts. The Austrian students increased their number of arguments by 17% and the Indian students even by 53%. Therefore, their post-concepts are distinguished by a higher degree of complexity.

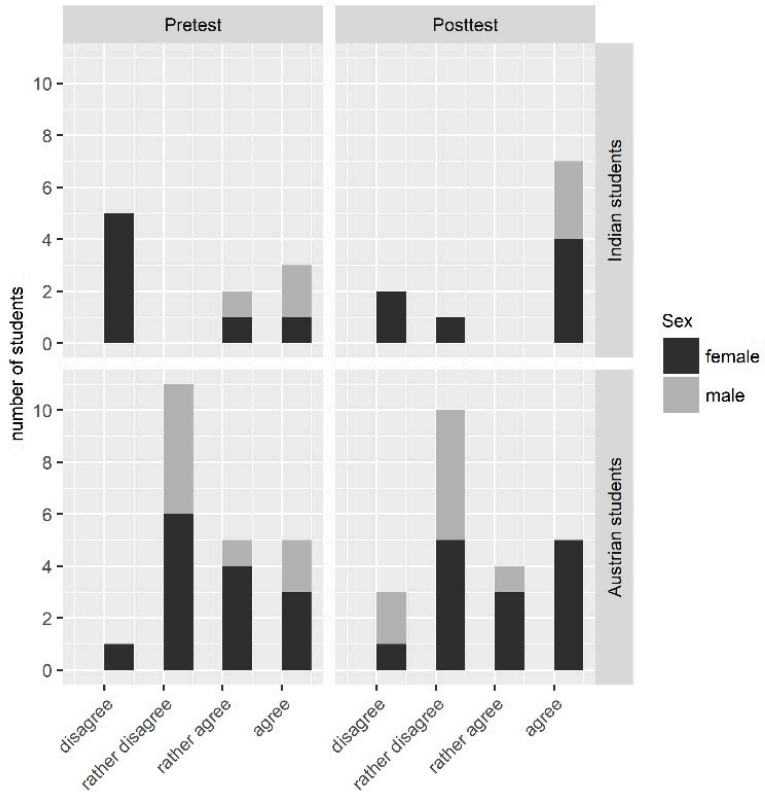


Figure 3. The students' valuation of the statement of the Indian Prime Minister. Indian students: N = 10; Austrian students: N = 22.

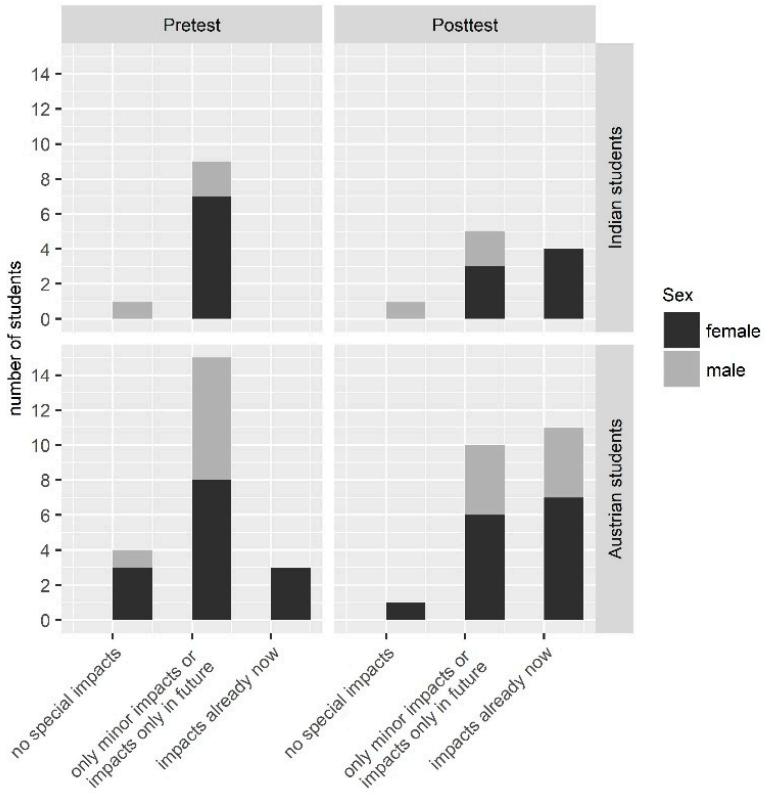


Figure 4. The students' awareness of the impact of environmental problems due to economic development on their personal life. Indian students: N = 10; Austrian students: N = 22.

It could be argued that dealing with the topics of gender equality and the relationship between the economy and the environment in the absence of an international collaboration would have shown the same effects. The fact that all Indian students mentioned observations regarding gender equality they made in Austria and 18 Austrian students referred to specific information they got from the Indian students about the situation in India, however, clearly indicates that the collaboration had a huge effect on the students' concepts. In case of the relationship between the economy and the environment, the effect of the international collaboration seems less obvious. But still four of the Austrian students explicitly referred to specific information they got from the Indian students about economic challenges in India and three of the Indian students mentioned the situation in Austria in their statements. Furthermore, the huge impression of the collaboration on the students became obvious when the discussions about both topics continued even long after the end of the workshops. During the final event of the project, several of the invited parents also mentioned that these issues were subsequently discussed in their families.

5. Conclusions

The students' awareness of gender inequality as well as their awareness of negative impacts of environmental problems on their quality of life increased during the project. Therefore, we are able to confirm our first research hypothesis. The collaboration between students from Austria and India raised the students' awareness that both topics influence their personal quality of life. The evaluation of matters connected with these topics changed as well. Between pre- and post-test 78% of all students rated their country differently in terms of gender inequality and 63% changed their rating of the controversial statement of the Indian Prime Minister. These results confirm our second research hypothesis. The collaboration between students from Austria and India leads to a change in the valuation of matters connected with these two topics.

It became apparent that the personal experiences of the Indian students while in Austria and their reports about the situation in India, dominated the discussions about gender (in)equality. On the other hand, additional information beyond sharing life experiences provided during workshops and during excursions played an important role for the discussions about the tension between economy and the environment as well. Nevertheless, it is important to keep in mind that the students changed their rating individually and partly in a completely different direction, based on their individual concepts at the beginning. Moreover, these changes are difficult to predict due to the high amount of different influencing factors which happened alongside the formal workshops.

The self-determined and collaborative way of learning during this project led to a high level of personal engagement of the students. All students were aware of the unique possibilities offered by this project. The intensive discussions continued after the workshops and even within the guest families. Hence, the project had an unintended multiplier effect that led to deep reflections that rarely can be reached in a normal learning setting. It is also worth mentioning, that two years after this project, some of the participants are still in contact with their counterparts.

To travel with students to another country or to host foreign students respectively requires an enormous organizational effort. This resulted in a small sample size for this study and, therefore, the findings must be interpreted with caution and cannot be simply generalized. Nevertheless, the results of the AustrIndia-4QOL project show that these efforts are worthwhile. International collaborations carried out with a high degree of active participation by the students and performed as a face-to-face collaboration can be a suitable approach to foster a conceptual change in the context of ESD.

According to our experiences during this project, a dilemma discussion about the tension between economy and environment at the beginning of the face-to-face workshops turned out to be an essential 'ice-breaker.' Fixed roles were given to the students in this first discussion and all students had to contribute. This laid the foundation for the subsequent intensive discussions and, therefore, the foundation for a confrontation of the students with numerous different arguments.

Additionally, regular self-reflection phases in homogenous groups in which the students reflected on their own behavior as well as the behavior of the 'others' during the discussions appeared important. The students could also reflect on probable causes of identified challenges and they could work out suggestions about how to deal with these challenges.

Most surveys in this field examine the impact on students from the Global North traveling to countries of the Global South. On the contrary, this particular survey offered the opportunity to switch the typical roles and to enable students from India to slip into the role of the discovering visitors. We believe that this fact could have helped to foster collaboration as equals and to prevent the often-criticized effect of the rich visiting the poor and helpless [13,19].

For this article, we only examined the impact on the students' awareness and how far this changing awareness led to a different evaluation of issues connected with the SDGs five and eight. A further evaluation of additional data will show if this international collaboration also had a wider impact on the students' concepts. Finally, we will compare the occurred conceptual changes of the students taking part in this face to face collaboration with those of students only taking part in the collaboration via social media during earlier stages of the AustrIndia-4QOL project.

Supplementary Materials: The following are available online at http://www.mdpi.com/2227-7102/8/4/187/s1, Figure S1. Individual response behavior of all students concerning the guiding question: 'What personal experiences have you had within your family, your circle of friends and in your personal environment regarding issues of gender inequality?,' Figure S2. Individual response behavior of all students concerning the guiding question: 'How do you evaluate the situation in your own country in general regarding issues of gender inequality?,' Figure S3. Individual response behavior of all students concerning the guiding question: 'In his speech alongside the climate conference in Paris 2015 the Indian Prime Minister Modi stressed that the poor countries cannot be blamed for the actual climate change and their pursuit of economic development must not be neglected. How do you personally evaluate this statement?' Figure S4. Individual response behavior of all students concerning the guiding question: 'Are there environmental problems due to economic development which have a direct negative impact on your personal life? If yes, specify the impact!.'

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