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## Research Article

# Analysis of Written Material-based, Multi-perspective Argumentation in Geography Lessons: A Comparison Between Two Samples From Ecuador and Germany

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**Abstract:** The ability to argue is an essential prerequisite for participating in social discourse as argumentation can be used, to form one's own opinion and to weigh up, evaluate and justify different options. Argumentation skills should be trained in geography classes in particular, as this subject often deals with socially relevant themes, including sustainability, climate change, and resource conflicts. A distinctive feature of geography teaching is the use of many different materials including maps, diagrams, and illustrations that serve as the foundation for arguments. The present study focuses on the skills and difficulties students have in writing a material-based, multi-perspective argumentation about a spatial conflict and compares those skills and difficulties of students from Ecuador ( $n = 42$ ) and from Germany ( $n = 17$ ) in terms of their similarities and differences. The students were provided with eight different materials from which they had to extract information about a spatial conflict and then had to write an argumentative text on the topic. These students' texts were then analysed using a model of the didactic requirements for a written, material-based, multi-perspective argumentation. The findings of this study indicate, that the skills and difficulties students had, seem to be due to the cognitive demands of the task rather than on the students' respective cultural and educational context as the results show comparable trends in most categories of the model in both countries. The students did not name many actors and rarely positioned them. Most argumentations were also not multi-perspective. Only a small amount of information from the materials was used by the students in their argumentations and rather imprecise, but mostly correctly and implicitly.

**Keywords:** written argumentation; multiple perspectives; material-based; conflict over the use of space; international comparison; Ecuador; Germany; argumentation skills

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## Highlights:

- Model for didactic requirements for a written, material-based, multi-perspective argumentation.
- International comparison of students' argumentation competences.
- International comparison of students' difficulties writing an argumentation.

## 1. Introduction

The ability to argue is an important fundamental requirement for participation in social discourse and is also essential in private areas, as arguments can be used to weigh up, evaluate and justify different (action) options (Budke & Meyer, 2015, p. 10). Participating in those social discourses is an important prerequisite for being an equal part of society (Maude, 2017, p. 36) and since arguing is an inevitable part of human coexistence, students should learn to argue well (Bonnett, 2011, p. xxi). Argumentation has been researched in numerous didactic studies in various subjects. In addition to geography, argumentation also plays a role in other school subjects such as maths (e.g., Schwarzkopf, 2015; Sriraman & Umland, 2020) history (e.g., Mierwald & Brauch, 2015; Monte-Sano & Allen, 2019) or German (e.g., Feilke & Tophinke, 2017; Pohl, 2020). The training of argumentation skills is particularly important in geography, as this subject often deals with the interaction between the environment and society, and socially relevant topics such as migration, climate change or resource conflicts (Deutsche Gesellschaft für Geographie e.V., 2020, p. 5), on which there are different opinions and positions that are justified by different arguments. These topics are expected to become increasingly important on a global scale in the coming years (World Economic Forum, 2021). In addition, argumentation skills are included in the competence area of communication (Deutsche Gesellschaft für Geographie e.V., 2020, p. 22). Previous studies in Germany (Budke et al., 2020; Budke et al., 2021; Gebele et al., 2022; Hindmarsh & Budke, 2023; Schwerdtfeger & Budke, 2021) have already been able to analyse some of the skills and difficulties of students in writing a material-based, multi-perspective argumentation. Among other things, students found it difficult to name all the actors involved in the conflict and to include multiple perspectives in their argumentation (Hindmarsh & Budke, 2023, p. 61f.). In

addition, they hardly used the information from the work materials and did not elaborate on it in depth (Hindmarsh & Budke, 2023, pp. 63-64; Schwerdtfeger & Budke, 2021, pp. 29-30). However, the students found it easy to present their own opinions. In addition, the position of the actors on the conflict was rarely, but always correctly presented (Hindmarsh & Budke, 2023, p. 64).

The objective of this study is to broaden the focus to an international level and to compare the argumentation skills of students from two different countries, namely Ecuador<sup>1</sup> and Germany. The aim of this study is not to provide an evaluation of the education systems of the two countries. The goal is to analyse the extent to which these skills and difficulties can generally be explained by the cognitive demands of the task of writing a geographical argumentation rather than on the students' respective educational context. Another aim of this study is to find out in which areas of a written, material-based and multi-perspective argumentation there is a need for support. The basis for this comparison is a model developed on the basis of scientific literature on the topic of argumentation, which represents the various didactic requirements of a written, material-based, multi-perspective argumentation (Figure 1 in section 2.5). This study addresses the question: *What are the differences and similarities in the skills and difficulties of students from Ecuador and Germany in a written, material-based, multi-perspective argumentation?*

Firstly, the theoretical background is addressed and the current state of research is presented. The didactic demands placed on the students by a written, material-based, multi-perspective argumentation task are then discussed and presented in a model. In addition, well-known international comparative didactic studies and their objectives are discussed. This is followed by a description of the survey procedure, an explanation of the analysis method and a presentation of the results. This paper closes with a discussion of the results and a conclusion.

## 2. Theoretical Background and current state of Research

### 2.1. Argumentation in the classroom

Argumentation is a form of communication in which evidence or reasons are given to support a particular claim. One of the best-known argumentation models was established by Toulmin (2003, p. 87ff.) (Original: 1958). According to him, an argument consists of a *claim* that can be substantiated by *data*. For example, the assertion that it is about to rain (*claim*) could be substantiated (*data*) by the fact that rain clouds can be seen on the horizon. Another component of an argument is the *warrant*, which represents an underlying rule. In the example of the upcoming rain, a *warrant* would be that rain clouds bring rain and therefore can be attributed to the high chance of rain. The *qualifier* indicates the assumed probability, for example, that the rain clouds will most likely or probably bring rain. A *backing* for this argument would be that a neighbour has already felt some rain drops. The final component of Toulmin's model is the *rebuttal*, which invalidates the claim. In this example, this could be the information on the weather forecast that the rain clouds will pass by without it raining.

Argumentation can be used to convince the other person of one's own opinion, a certain idea or to justify a certain perspective. Argumentation can also be seen as a form of peaceful conflict resolution (Budke & Meyer, 2015, p. 10f.). Previous studies have shown that students find it difficult to write structurally complex arguments (Riemeier et al., 2012, p. 168). They also find it difficult to provide evidence for their reasons (Duschl & Ellenbogen, 2009, p. 115) or to justify their evidence (Sampson et al., 2013, p. 32). In addition, they mainly use arguments that support their own opinion (ibid, p. 32). They also find it easier to choose a convincing (counter-)argument than to write a convincing (counter-)argument and reason better about topics they have prior knowledge and/or personal interest about (Evagorou et al., 2023, p. 622). In material-based argumentation, where students use information from materials as the basis for their arguments (described in more detail below), they use only a small amount of the information available to them in the materials (Hindmarsh & Budke, 2023; Schwerdtfeger & Budke, 2021). In general, argumentation tasks are rarely found in German geography textbooks. In a textbook analysis, Budke (2011, p. 256ff.) found that only 361 (6.7 %) of a total of 5784 tasks were argumentation tasks. Argumentation tasks make up a negligible proportion of the total number of tasks in textbooks in other countries as well. In Vietnam, for example, the proportion of tasks involving argumentation is only between 0.65 % and 4.85 % of the total tasks (Nguyen & Budke, 2022, p. 34). In the school subjects of philosophy and ethics, for example, a textbook analysis of grades 5 to 10 by Burkard (2021, p. 47) showed that although there were numerous argument-related tasks in the textbooks, the term „argument“ is rarely used and not uniformly defined.

### 2.2. Written Argumentation

Argumentation can be either verbal or written. In contrast to verbal argumentation, written argumentation does not involve a real-time exchange with a real counterpart. The person writing the argumentation must therefore include and refute the possible arguments and objections of the fictitious counterpart (Feilke & Tophinke, 2017, p. 8).

### 2.3. Material-based Argumentation

A characteristic of geography lessons is that they usually work with many different types of materials (Erzner, 2013, p. 59), which can be in the form of continuous text or in the form of discontinuous text. A continuous text is a classic running text and a discontinuous text is text in a non-linear form, e.g., tables, maps, (climate) diagrams, etc. The latter are often used in geography lessons and therefore of great importance in this subject (Huber & Stallhofer, 2010, p. 223). In addition, writing is a typical task in geography lessons (Budke, 2021, p. 66f.). Material-based writing means that the students take information from the available teaching materials and then use it in their own texts (Abraham et al., 2015, p. 4); in the case of writing argumentative texts, this information can then be used as evidence. This evidence is used, on the one hand, to form an opinion and, on the other hand, to convince other people of that opinion. It is also important for forming one's own opinion in extracurricular areas, as people also make their decisions in their private lives on the basis of the information available to them (Osborne et al., 2004, p. 995). It is therefore of great importance that students learn to argue on the basis of data and facts that they take from various materials. Especially in democratic societies, it is important that students learn to evaluate information they receive from (different) sources or the media (Roberts, 2013, p. 72). A very high value in a democracy is freedom of expression and freedom of the press. Citizens in democracies are allowed to freely express their opinions and, for example, publicly criticise political issues, discuss them and participate politically. Other important values in a democracy

<sup>1</sup> We chose these two countries because, among other reasons, they differ in their socio-economic structures, allowing us to compare very different student samples.

are diversity and tolerance. This also means, among other things, that people (within the framework of the constitution) are allowed to have different opinions, which they can base on different arguments, without experiencing repression by the regime.

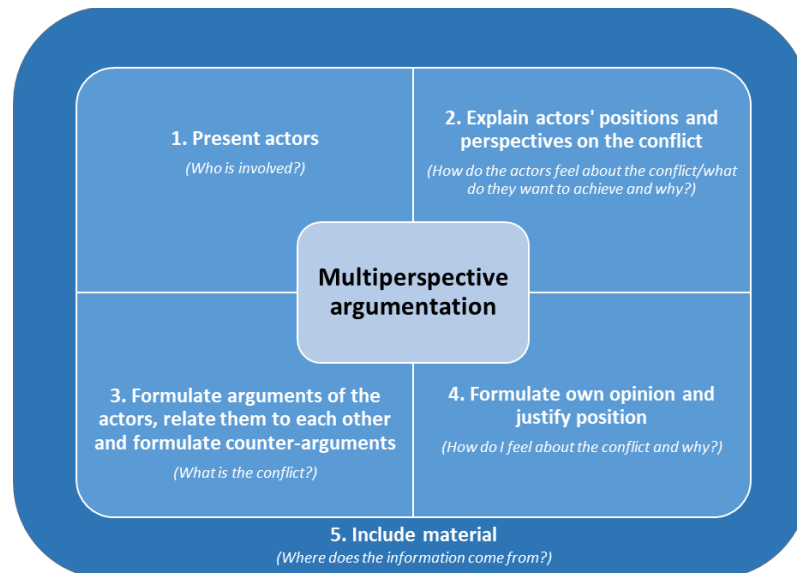
## 2.4. Multi-perspective Argumentation

Since the starting point for an argumentation is a controversial issue (Spranz-Fogasy, 2006, p. 28) on which at least two actors have different perspectives, an argumentation is never mono-perspective, but either bi- or mostly multi-perspective. As already mentioned, geography in particular deals with controversial social issues such as migration policy and climate change, in which different opinions collide and are justified by different arguments. In contrast to other subjects, multi-perspectivity is therefore considered an important quality criterion for argumentation in geography education (Budke et al., 2015, p. 286).

## 2.5. Requirements for a written, material-based, multi-perspective argumentation

To summarise, it can be said that argumentation is a common practice and that promoting argumentation skills should take place in school. Geography lessons are particularly suitable for this promotion because they deal with controversial topics, which are a basis and prerequisite for argumentation. The component of multi-perspectivity results from the different perspectives that arise from controversy. The component of material-based work results from the frequent use of different types of material in geography lessons. And the written component results from the fact that geography lessons often involve written tasks.

The previous sections have already described various didactic requirements that are placed on students by an argumentation task that is written, material-based and multi-perspective. These are summarised and illustrated once again in the following model (see Figure 1). Since the basis for an argumentation in geography is a controversial issue, such as conflicts over resources or the use of space, in which several actors are involved, these actors must first be named by the students (1 in Figure 1). These actors may have different positions and perspectives on this controversial issue or conflict. They represent different interests and have different motives. This should also be described and explained by the students (2 in Figure 1). In order to do so, it is essential to present the arguments of the actors and link them to each other. In written arguments, counter-arguments should also be named and rebutted (3 in Figure 1). In addition, the students should form their own opinion about the conflict based on the information available to them in the materials and present it in a substantiated argumentation (4 in Figure 1). The information and facts about the disputed matter, which they should use as evidence for their argumentation, can be found in the materials, which can be understood as a kind of framework for the written, material-based, multi-perspective argumentation. The students should not only extract the information and use it as evidence in arguments, but also refer to the respective source in order to make their argumentation comprehensible (5 in Figure 1).



**Figure 1.** Didactic requirements for a written, material-based, multi-perspective argumentation in geography lessons (Hindmarsh & Budke, 2023, p. 58)

## 3. Scientific comparative studies

Comparing is an everyday practice and is used, for example, by individuals before buying a certain object, when looking for a flat or planning a holiday. In a comparison, at least two objects are contrasted and checked for similarities and differences that might not have been recognisable without a comparison (Namy & Gentner, 2002, p. 6). Comparison can be described as a „reflective and argumentative process“ (Wilcke & Budke, 2019, p. 4). According to the model of the step-by-step comparison method by Wilcke & Budke (2019, p. 7ff.), a comparison consists of six consecutive steps. First, a geographical question is developed (i). Then the units of comparison are determined and information is retrieved and analysed (ii). In a next step the comparison variables are defined and information is retrieved and analysed (iii). After comparing the differences and similarities of these units on the basis of the defined variables (iv), these variables are weighed up and connections between the units are

established and explanations are drawn up (v). In a final step, the results are analysed and the initial question is answered (vi). In scientific comparative studies, empirical data is collected from at least two different contexts and compared with each other using methods appropriate to the occasion or objective (Kosmützky & Wöhlert, 2023, p. 293ff.). The aim is to identify similarities, patterns and differences between the two objects of comparison. The results of such studies not only serve to describe, explain or interpret reality, but can also be used „as an input for the diagnosis of social problems and for the design of public policies and, at the same time, as a reference parameter and a source of legitimation“ (Piovani & Krawczyk, 2017, p. 822). There are numerous studies in which the performance and competences of students are compared internationally.

### 3.1. Comparative studies in educational science

As societies are constantly changing, the education system must also adapt to current social challenges. A comparative look at how other education systems deal with the same or similar challenges can help to develop solution strategies (Schwippert et al., 2020, p. 25f.). One of the largest and best-known comparative educational studies is PISA (Programme for International Student Assessment), in which a total of 93 countries took part. This study has been carried out by the Organisation for Economic Co-operation and Development (OECD) every three years since 2000. Germany has participated every time. Ecuador has not been part of this study to date. The PISA study „assesses the extent to which students near the end of compulsory education have acquired key knowledge and skills that are essential for full participation in modern societies“ (OECD, 2014, p. 24). These include skills in reading, maths and science. In addition, data on the gender, migration background and social background of the students is collected and correlated with their competences. The TIMSS study (Trends in International Mathematics and Science Study) has been conducted regularly in grades 4 and 8 in the areas of maths and science since 1995, with more than 70 countries currently participating (Mullis et al., 2021, p. 1). In the PISA study in 2000, German students performed worse than expected. The competences of German students were below the OECD average in all three areas (reading, maths and science) (Artelt et al., 2001). After Germany achieved the same competence values in the TIMSS study in the three years 2007, 2011 and 2015, this value fell in 2019 (from 528 points to 518 points) (Schwippert et al., 2020, p. 144). The same institution that conducts the TIMSS study, the IEA (International Association for the Evaluation of Educational Achievement), has also been conducting another international comparative study in the area of reading since 2001. This PIRLS study (Progress in International Reading Literacy Study) is currently being carried out in 57 countries (TIMSS & PIRLS International Study Center, 2023b). In addition to the effectiveness of each country's education system and the existence of gaps in their learning resources and opportunities and weaknesses, these two studies also investigate other (contextual) factors that can contribute to academic success. These include „school resources, student attitudes, instructional practices, and support at home“ (TIMSS & PIRLS International Study Center, 2023a). Such international comparative studies can be an impetus for change. For example, some measures were taken after Germany performed significantly worse than expected and the results were below the OECD average. After this so-called „PISA Shock“ in 2000, among other things, national educational standards in several subjects were introduced (Davoli & Entorf, 2018, p. 4 f.). Even before the „PISA Shock“, changes were being considered with regard to introduce centralised assessments, but after the PISA results those considerations gained intensity and also served as a legitimisation (Waldow, 2009, p. 478f.). To date, no competences in the subject of geography have been surveyed in these larger educational studies. There are also no international comparative studies on the argumentation skills of students.

In addition to competence comparisons, comparisons of teaching materials are also frequently found in educational research. These include international comparisons of textbooks (e.g., Maier & Budke, 2016; Simon et al., 2020). These studies aim to identify international similarities and/or differences between textbooks, for example, with regard to the tasks and content of various subject areas. Maier and Budke (2016, p. 24f.), who compared school textbooks from England and North Rhine-Westphalia with regard to planning tasks, came to the conclusion, among other things, that German textbooks contained significantly fewer explicit multi-perspective planning tasks (24 %) than English textbooks (52 %). The authors saw the reasons for this in the fact that the planning tasks in the German textbooks examined were more concerned with the realisation of life goals on an individual level, whereas the English planning tasks examined focused more on problem solving. Simon et al. (2020) compared geography textbooks from England, France and Germany with regard to the comparative tasks set in them. The study found that most of the comparison tasks (especially in England and Germany) were very simple tasks aimed at a simple comparison of the content and that many of the tasks did not promote the development of comparison skills. Tasks in which the students have to make complex comparisons that they justify argumentatively were very rare.

Textbooks have been used in schools for centuries and serve alongside other media „as a didactic medium in book form for the planning, initiation, support and evaluation of school [learning processes]“ (Wiater, 2002, p. 2) They can „provide information about education and upbringing, teaching and learning in the social institution of school at a specific time and in a specific regional area“ (ibid., p. 5). Textbooks can therefore provide information about the content and the way of teaching and learning and, depending on the focus of the research, identify differences in the various subjects, time periods or countries.

### 3.2. Criticism of comparative educational studies

Although comparative education studies provide contributions and impetus for improvements, they are also subject to criticism. For example, the fundamental comparability of countries is called into question, as educational realities and/or education systems can differ greatly from one another (Singer et al., 2018, p. 38). Another point of criticism of such Large Scale Assessment studies is that the focus is on the core subjects (reading, maths, and science) and the measurable, as Tillmann (2016, p. 11) mentions in his overview article on the most common criticisms of these educational science studies. This means that the competences of students in the other subjects, their critical thinking or creativity are not examined, and the concept of education is thus narrowed. In addition, Tillmann (2016) notes that the context is always important when transferring results from empirical educational research to the school-practice level (ibid., p. 14-15).

## 4. Method

The following section explains the methods used to answer the question about the general cognitive challenges as well as the skills and difficulties of the Ecuadorian and German students when writing material-based, multi-perspective argumentations in geography lessons. Firstly, the sample of the study is explained and then the procedure of the survey and analysis is presented.

#### 4.1. Sample

The written, material-based, multi-perspective argumentation skills of students from three classes in two different countries were examined. The first survey took place in June 2021 at a secondary school in Cologne with 17 students aged 14 to 15 from an 8th grade class shortly before the end of the school year. Three of the students had special educational needs either in the area of „learning“ or in the area of „emotional and social development“. The second survey took place in Ecuador in September 2022 at a public school in Atuntaqui at the beginning of the 9th grade in two classes within two weeks. A total of 42 students (with the exception of one 14-year-old student) aged 12 to 13 took part in the survey in Ecuador. There were no known special educational needs in these two classes. Before the study was conducted, the schools, the teachers, the parents of the participating students and the participating students were informed about this study. The students knew at all times that they were part of the study and were able to ask any questions. In addition, the data was anonymised so that no conclusions could be drawn about the individual person.

#### 4.2. Surveys

The individual surveys in the three classes were each conducted on two days. On the first day, the students were introduced to the project and the people involved and socio-demographic data was collected using a questionnaire that the students filled out. The content was about an authentic conflict over the use of space regarding the planned expansion of a football club's training ground in a park in the German city of Cologne. In Ecuador, the students also received some additional information in the form of maps and an informational text. In addition, all three classes were given a short thematic introduction to the conflict over the use of space, in which the actors were introduced and positioned on the opinion scale<sup>2</sup> on the blackboard or whiteboard with the help of the students. The students were also asked to position themselves on the opinion scale according to their opinion of the expansion of the training ground<sup>3</sup>. The introduction on the first day of the survey ended with a brief presentation of the materials and tasks for the coming day. The following day, after a brief repetition, the materials were handed out. The students had just under four hours to work on the materials (available online at: [https://www.ilias.uni-koeln.de/ilias/goto\\_uk\\_pg\\_470523\\_6064201.html](https://www.ilias.uni-koeln.de/ilias/goto_uk_pg_470523_6064201.html)) and write their argumentative texts, in the form of a letter to the Mayor of Cologne, in which they were to inform her about the conflict and convince her of their opinion. In the eight different materials, the students were given information on the location of the green belt, the training site and the various actors and their perspectives and arguments. These eight materials, that the students were to use as a source for their arguments, included discontinuous texts such as two maps (one of the city of Cologne and one of the exact section where the extension is planned to be built), a table showing the results of a signature collection and a diagram showing the ratio between the club's youth teams and professional teams; continuous texts such as two conversations in the form of speech bubbles and a letter from a reader in the form of a newspaper article; and a combination of both: a photo showing the current use of the park with a speech bubble. In addition to these content materials, which the students were to use to acquire information about the conflict, there were also support materials to help the students write the letter to the Mayor of Cologne. These three support materials included a checklist on which the students could tick off the individual work steps; a writing plan on which the individual phases of the writing process were illustrated and exemplary sentence fragments were given; and a planning poster to help the students organise the arguments and assign them to the respective material and actor.

#### 4.3. Analysis

The student-produced results (texts) were analysed according to the didactic requirements for written material-based, multi-perspective argumentations (see model in section 2.5). This process is described below and illustrated using examples from the student texts<sup>4</sup>.

The qualitative data was quantified for the analysis for most parts of the model in order to determine frequencies and patterns (Vogl, 2017, p. 287ff.). The evaluation of the German texts took place in 2021/2022 in collaboration with several people (the authors and student assistants). The second survey (of the Spanish-language results from Ecuador) was analysed by one person in 2023/2024. In order to assess the reliability and consistency of the evaluation done by one person, to minimise errors in those parts where the data was quantified, the texts were evaluated in two rounds with a time gap and the Cohen's Kappa intrarater coefficient was then calculated. If the value of the intrarater was between 0.6 and below 1, the cases in which the results of the two evaluations were different were checked again and a final and uniform decision was made in each category. In the few cases with a value of less than 0.6, the coding guideline was specified again and a third evaluation was carried out with another time gap and a new intrarater was calculated. The intraraters were between 0.641 and 1 for the individual variables and 0.834 on average for the entire evaluation. Intraraters from 0.61 are considered „substantial“ and intraraters from 0.81 are considered „almost perfect“ (Landis & Koch, 1977, p. 165).

##### 4.3.1. Analysing the presentation of actors

First, the student texts were analysed to determine whether the students had named the actors involved in the space use conflict. It was not only considered a mention if the students wrote the correct names of the actors, such as „the Citizen from Sülz“, but also if it was clear from

<sup>2</sup> An opinion scale is a kind of scale, ranging from „strongly agree“ to „neutral“ to „strongly disagree“, on which the students position the actors and themselves according to their (perceived) opinion on the controversial topic.

<sup>3</sup> Due to the coronavirus pandemic, the students were not asked to come to the front of the board but were simply asked to show where they positioned themselves on the opinion scale by raising their hands.

<sup>4</sup> Each of these text examples is labelled with a code. Those codes begin with a letter that indicates the country. „E“ stands for Ecuador and „D“ for Germany. This letter is followed by the individual number that was assigned to the students before the survey in order to anonymise the data. For the German students, it was also labelled whether the respective student has a special educational need. Roman two means that no special educational need was known. The suffix „ICa“ stands for a special educational need in the area of „emotional and social development“ and the suffix „IAa“ for a special educational need in the area of „learning“.



the context which actor the students meant. In this text example: „[...] because for some people it is a recreational area [...]“ (E305), for example, the correct name was not given, but it is clearly recognisable that the student means the residents of the district, i.e., the actor „Citizen from Sülz“.

#### 4.3.2. Analysing the positioning of the actors and their perspective on the conflict

In a further step, it was analysed whether the students position the actors and present their perspective on the conflict. It was also analysed how many perspectives they include in their argumentation, i.e., whether their argumentation is mono-, bi- or multi-perspective. When positioning the actors, it was analysed whether the students use expressions such as „is against“ or „is in favour“ or „would like“ or „would not like“ in connection with the naming of the actor, such as here: „[...] the Citizen of Sülz, the gentleman of Movimiento Ciudadano and the member of NABU do not want them to build in the green belt [...]“ (E301). In addition, implicit formulations were also considered to be a positioning of the respective actor, such as the expression „is allowed“ as it implicitly indicates that the respective actor wants something, i.e., is in favour of expanding the training ground. If a student expresses their own opinion about the conflict (e.g., whether the football ground should be extended or not) and uses the arguments of an actor to justify their own opinion, it does not count as a positioning of the actor. One student wrote, for example: „[...] this [place] is for everyone and they exercise, jog and are with the family, please do not enlarge the soccer fields.“ (E302). The student implicitly argues on behalf of the residents that the football pitches should not be enlarged but does not state whether the actor is in favour of or against the expansion. Therefore, it does not count as a positioning of the actor.

In the presentation of the actors' perspectives, it was analysed whether the students present the arguments of the respective actor in their texts. In the text example: „[...] they would damage the environment, they would end the lives of animals just to build a soccer field [...]“ (E322), the arguments of the actor „NABU Employee“ (Nature and Biodiversity Conservation Union), who is committed to the preservation of the environment and biodiversity, are mentioned and thus the perspective of this actor is presented.

In addition, we analysed how many perspectives the students included in their arguments. In some cases, the actors' arguments were formulated so imprecisely that they could not be assigned to just one actor, especially since the actors' perspectives sometimes overlapped. The following text example: „[...] through the expansion, the 1st FC Cologne can train more and also perhaps become better.“ (D111Ca), for example, could be attributed to both the Youth Player and the Board of the 1st FC Cologne. However, as this argumentation is not bi-perspective, such cases were counted as only one perspective.

#### 4.3.3. Analysing the description of the conflict

In addition, it was analysed whether and to what extent the students name and describe the conflict. A conflict can be named either by using terms such as „conflict“, „dispute“ or „discussion“ in combination with describing the conflict like in the following text: „The conflict was because Cologne wants to receive a permit to implement or extend its training camp in the green belt.“ (E411), or by describing that there are different interests in using the space or that there are people against or in favour of the expansion, without using terms such as „conflict“, „dispute“ or „discussion“ like in this text: „On the question of the construction of the stadium, on the one hand there are people who are in favour, on the other hand those who are against building the stadium.“ (E320). A simple mention of terms such as „conflict“, „dispute“ or „discussion“ without a description was not counted as a description of the conflict.

#### 4.3.4. Analysing the formulation of the actors' arguments

In this category, the students' argumentations were analysed in a qualitative and inductive manner and the extent to which they differ in terms of scope and complexity in these two countries was examined. In addition, the differences in the content and thematic focus of the argumentations were analysed. Finally, a further inductive approach was used to analyse in which areas there were more differences and similarities.

#### 4.3.5. Analysing the formulation of one's own opinion

In this category it was analysed how the students expressed their own opinions on the conflict, which the students expressed with the linguistic means such as „I am of the opinion that ...“ or „I am in favour of/against“. In the text example: „[...] my opinion is that I don't agree with it [...]“ (E301), the student clearly positions themselves against the expansion of the training ground.

#### 4.3.6. Analysing the use of information contained in the material and material reference

In addition, it was analysed if the students used the information provided in the material in their argumentations and to what extent the students refer to the material in their texts. A distinction was made between explicit and implicit use of material. An explicit reference to the material is made, for example, by expressions such as „in map M1 you can see...“ or „in material M4 it says that...“. An implicit reference to the material merely consisted of the reproduction of information from the materials without naming the source of the information. A material was counted as „used“ if at least one piece of information from the material was mentioned in the student text. In some cases, the information was formulated so imprecisely that it could not be clearly assigned to just one material, but to two materials. As the information from both materials was probably mixed in such cases, both materials were counted as „used“. In the case of an „incorrect use“, i.e., the presentation of incorrect information, such as that houses would be destroyed by the expansion of the training ground, as in this text example: „[...] it would destroy many houses [...]“ (E318), a material was also assigned if it was plausible. In this case, for example, it can be assumed that this impression was created by the map, which shows a housing area in the direct neighbourhood of the park section where the expansion is planned.

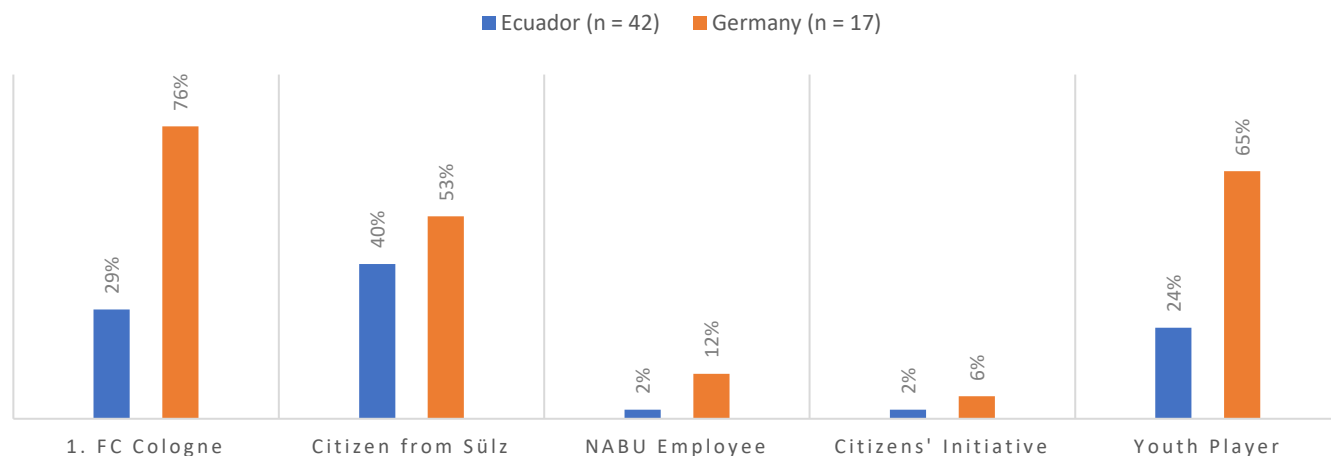
## 5. Results

### 5.1. Presenting the actors

The analysis of the presenting of the actors showed that the students in both countries had similar tendencies in that not all relevant actors that were presented in the material were named (see Figure 2). Some actors were mentioned much more frequently than others. The actors „1. FC Cologne“, the „Youth Player“ and the „Citizen from Sülz“ were mentioned much more frequently in both countries than the actors „NABU

Employee“ and the „Citizens' Initiative Green Belt for Everyone“. The proportion of students who named actors was higher in Germany than in Ecuador.

## Presenting the Actors



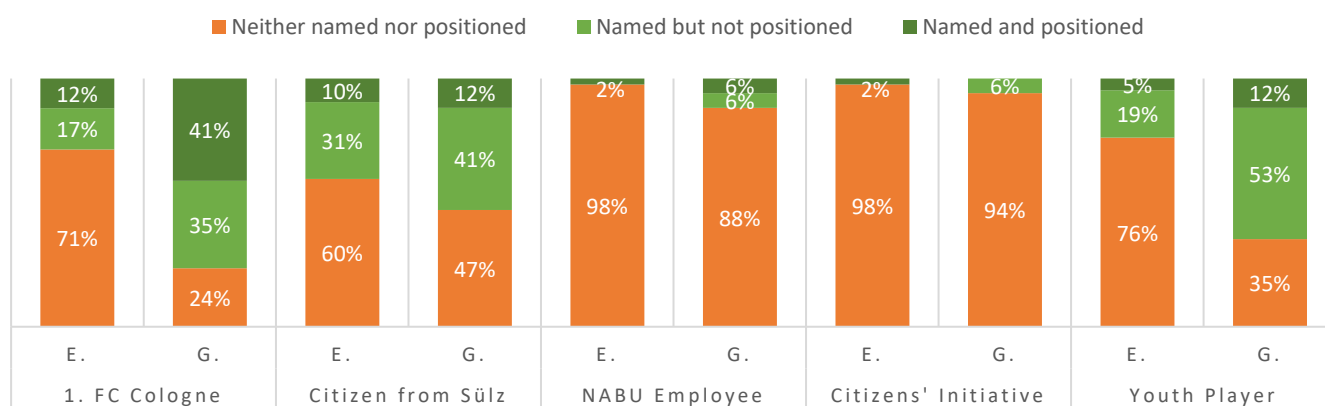
**Figure 2.** Presenting the actors from the material in the student texts (own illustration)

### 5.2. Positioning the actors

Similar tendencies were also seen in the positioning of the actors in both countries. Most students did not position the actors (see Figure 3). To do so, they would first have had to name the respective actor and then state their position on the conflict, i.e., whether the respective actor is in favour of or against the expansion of the training ground. The majority of the students in both countries do not seem to be aware that in order to write a geographical argumentation, they have to identify the relevant actors and analyse their position on the conflict. Percentage-wise, students in Germany positioned more actors than students in Ecuador. It was also evident that although the Ecuadorian students were less likely to clearly position the actors, they sometimes still mentioned in their texts that there are people who are in favour of the enlargement and/or there are some who are against the enlargement. In the following text example: „[...] on the one hand there are people who are in favour, on the other hand those who are against building the stadium.“ (E320), for example, it was recognised that a conflict exists. However, it was not specified which actors were involved in each case, therefore it does not count as positioning an actor.

## Naming and Positioning the Actors

E.: n = 42  
G.: n = 17



**Figure 3.** Positioning of the actors in the student texts. „E.“ stands for Ecuador and „G.“ stands for Germany (own illustration)

### 5.3. Describing the conflict

If the students named and described the conflict, varied between the two countries (see Figure 4). In Germany, the conflict was mentioned and/or described more frequently than in Ecuador. The students rarely seemed to have misunderstood the content of the conflict or were unable to express it linguistically. For example, one Ecuadorian student wrote: „I would like the park to be bigger so that there is more space [...]“ (E304), although it is the training ground that is to be enlarged and not the park. It also happened that a few Ecuadorian students proposed a solution in which none of the parties to the conflict had to give up anything, as can be seen in this text example: „[...] I think you should build the courts but

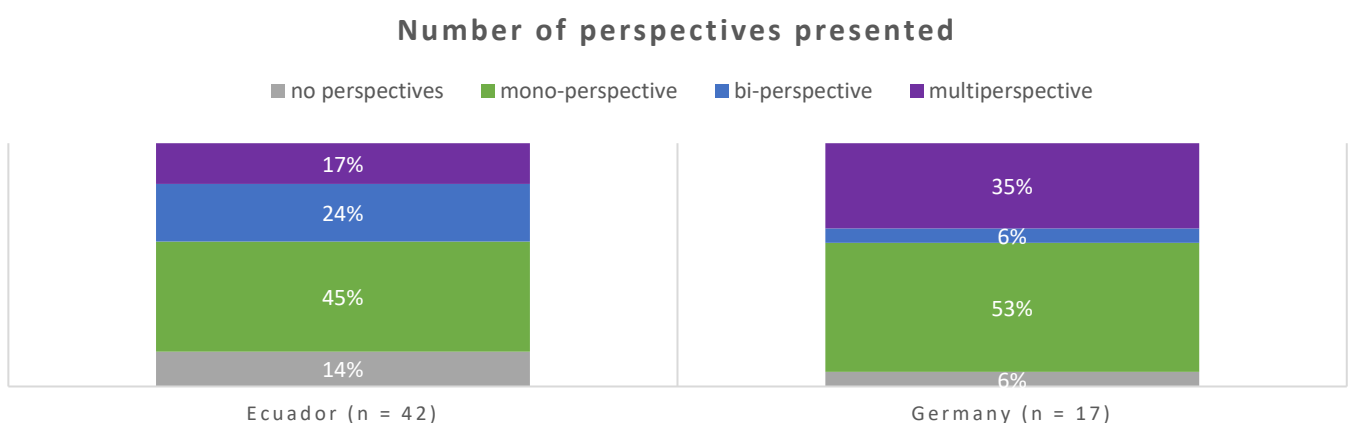
without occupying any recreational place [...] do not occupy any public place or occupy a natural place that may affect any plant or animal and person [...]” (E324). Here, the student did not seem to be aware that the conflict is precisely that the different uses of the area are mutually exclusive. In Ecuador, it also happened that a few students used the word „conflict” but did not describe what the conflict was about. Such cases were therefore not counted as conflict descriptions.



**Figure 4.** Description of the conflict in the student texts (own illustration)

#### 5.4. Presentation of the actors' perspectives

The presentation of perspectives also revealed similar tendencies in the skills of students from both countries. The majority of students designed their argumentation mono-perspectively and thus did not fulfil the requirements for a multi-perspective geographical argumentation (see Figure 5). The Ecuadorian students framed their argumentation more often from a bi-perspective than the German students and the German students more often from a multi-perspective (three or more perspectives). None of the students highlighted all five perspectives presented in the teaching material. Formulating multi-perspective arguments seems to have been a challenge for the majority of students. The arguments of the actors were also often formulated very imprecisely, reflecting the perspective of two actors. This was particularly the case with the actors „Youth Player” and „Board of 1. FC Cologne” as well as with the actors „NABU Employee” and „Member of the Citizens' Initiative Green Belt for Everyone”, as the arguments of these actors overlap in terms of content. However, as such cases are not a bi-perspective argumentation, it was counted as one perspective.



**Figure 5.** Number of perspectives of the actors presented or adopted from the material in the student texts (own illustration)

#### 5.5. Presenting own opinion on the conflict

This category also showed similar tendencies in the two countries. Most students were able to formulate a clear opinion on the conflict and fulfil this part of the requirements of the argumentative task well. In both countries, a larger proportion of students expressed their negative opinion about the expansion of the training ground in their written argumentation and fewer students were in favour of it (see Figure 6). In both countries, there were also students whose opinions were either unclear or contradictory. In Germany, there was also one neutral student and some students who did not state their own opinion on the conflict at all. In Ecuador, all students expressed their own opinion on the conflict.



### Own opinion to the conflict

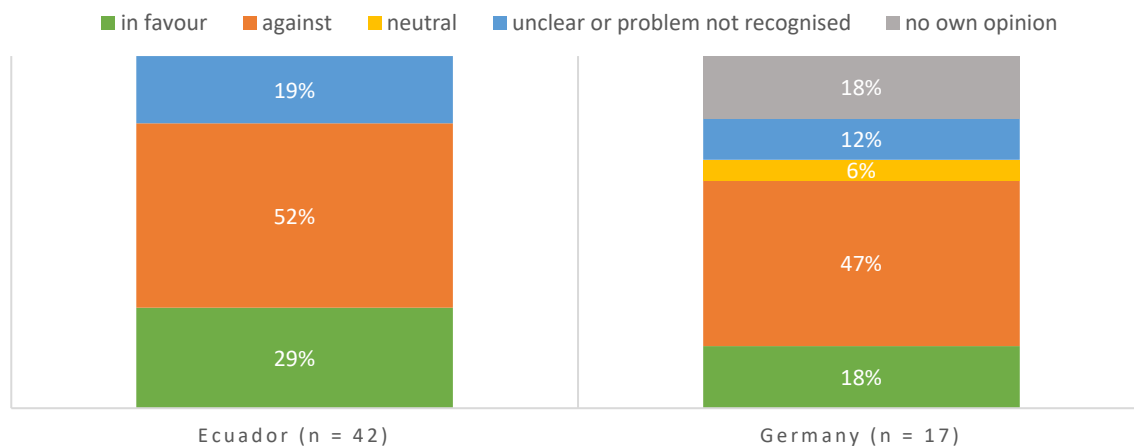


Figure 6. Presentation of own opinion on the conflict in the student texts (own illustration)

#### 5.6. Formulation of the actors' arguments

Generally, the texts from both countries contained few arguments compared to the number of arguments the students could have taken from the eight materials they were given. In addition, the arguments were rarely elaborated on or further explained by the students. One exception would be this example: „[...] there are people who go and entertain themselves in the park and go to do sports, picnics, walking and cycling **if they expand the court there will not be much space to do the activities.**“ (E308). Here, the student not only describes that the place is currently used by people for leisure activities, but also explicitly writes that this would no longer be possible if the training ground was built. Some of the Ecuadorian students elaborated on their arguments a little more than the German students, but also repeated some of their content.

Differences in the content of the arguments were also recognisable between the two countries. For example, the Ecuadorian students mentioned the aspect of „oxygen“ or „air“, e.g., when trees are felled or when there is more traffic due to the expansion of the training ground. However, this also reveals some misconceptions, such as the idea that the air could become thinner or that oxygen could become less pure (see text examples below). In addition, they sometimes seem to overestimate the dimension of the project and thus its ecological impact.

*„[...] the air will become thinner, trees that help to keep the air clean will be lost.“ (E405).*

*„[...] the trees bring oxygen and purify it, maybe they will build and expand the training field but the oxygen will be impure, [...] but oxygen cannot be bought and without oxygen, material things do not serve for anything.“ (E318).*

The aspect of „family“ was also represented among the Ecuadorian students, which again shows that not only the inclusion of teaching material, but also one's own previous knowledge based on cultural experiences is relevant for the formulation of arguments:

*„[...] it is preferable not to extend the field, because there will be people who want to walk, spend time with their families [...]“ (E409).*

*„[...] and this is for everyone and they exercise, jog and are with the family [...]“ (E302).*

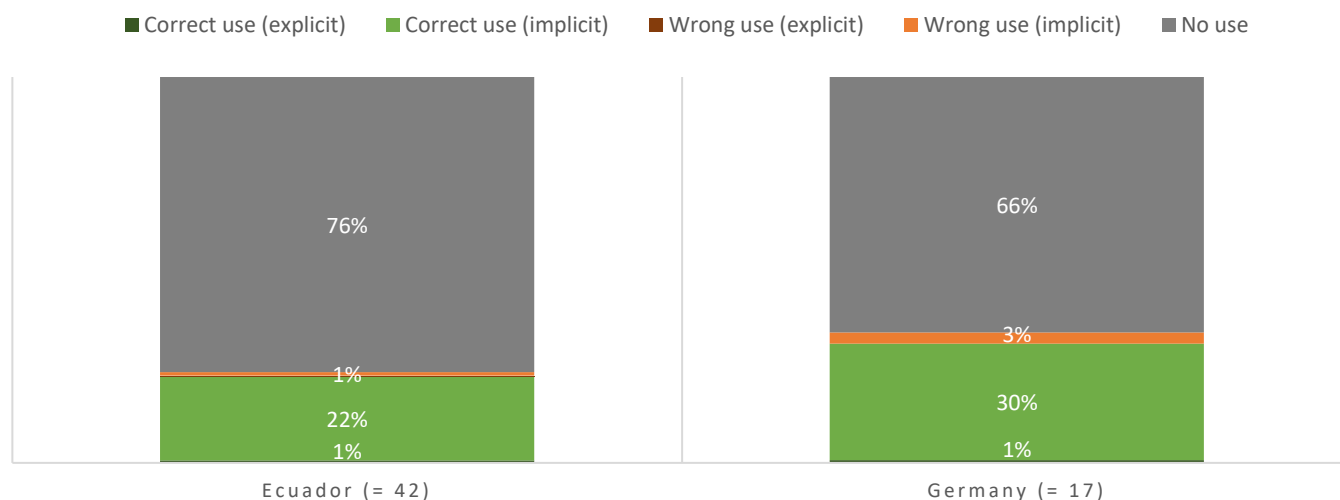
The texts also showed that some of the Ecuadorian students could identify with the topic and assessed it against the background of their own lives. For example, one student wrote the following: „[...] I want to be a professional soccer player and someday play on the field of FC Cologne [...]“ (E325).

In addition, students from both countries often adopted the actors' arguments and used them as their own. For example, they rarely said something like „[...] the Citizen of Sülz says that they lose their recreational space, the NABU member says that animals lose their homes [...]“ (E301), but rather adopted the arguments as their own by presenting them as a generally valid statement.

#### 5.7. Use of information from the materials in own text

In both countries, students used very little information from the materials (see Figure 7). In Ecuador, no information of 76 % of the materials provided to the students was used by them in their texts. In Germany no information of 66 % of the materials was used. However, when they did use the information, it was done correctly and implicitly in the vast majority of cases. In rare cases, the information from the materials was explicitly used and correct or implicitly used and incorrect. Although there were several pieces of information in the respective materials that the students could have used in their argumentative texts, the use was mostly limited to one to a few pieces of information per material.

### Use of Information from the Material in own Text

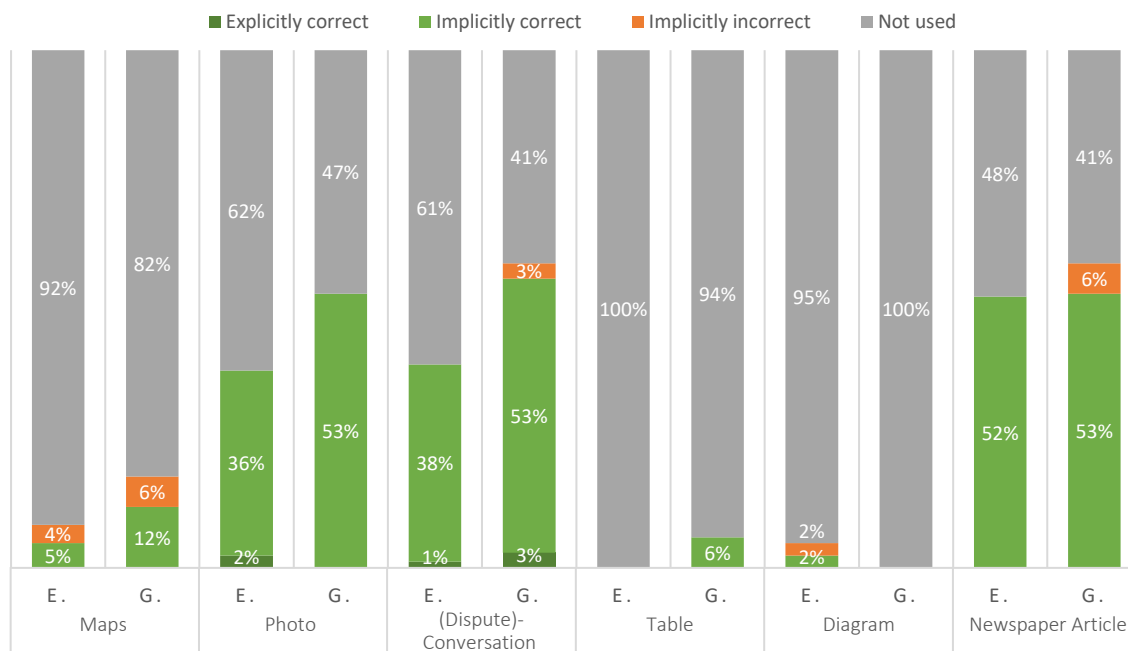


**Figure 7.** Use of information from the materials in the student texts (own illustration)

Similar tendencies were also evident in the type of material the students used information from in their own texts (see Figure 8). Students in both countries seemed to find it easier to work with materials that contained continuous text, such as the photo (with speech bubble), the (debate) conversations or the newspaper article. Information from the maps, the table or the diagram was hardly used in either country. Presumably, the students lacked the methodological skills to transfer the information from discontinuous texts into their own continuous text.

### Type of material from which information was used

E.: n = 42  
G.: n = 17



**Figure 8.** Type of material from which information was taken for the own text. A material was counted as used if at least one piece of information was inserted by the students into their own text (own illustration)

## 6. Discussion

The following section concludes by discussing the results of the research question of what differences and similarities exist in the skills and difficulties of students from Ecuador and Germany in written, material-based, multi-perspective argumentation. Firstly, the similarities between the text products of the Ecuadorian and German students and the possible causes of these similarities will be discussed. This will be followed by a discussion of the differences and their possible causes.

In most of the categories used to analyse the argumentative texts, comparable trends in student performances could be seen in both countries. Many students in both countries seemed to find it easy to express their own opinions. In some cases (in both countries), their own opinion was even the only thing they wrote in their text in terms of content. With regard to their own positioning on the conflict over the use of space, similar tendencies were also evident among students from both countries. Even though the majority of students in both Ecuador and Germany were against the planned expansion of the FC Cologne's training ground, there were also voices in favour of the planned expansion. This shows that working with the materials was suitable for forming an opinion on the conflict and that it was possible to form an opinion both in favour of and against the planned expansion. Other didactic studies have found that argumentation tasks are suitable for promoting the formation of one's own opinion (Maier, 2015, p. 315). Similar trends were also seen in the category 'Presenting the actors'. The difference between the frequently mentioned and the less frequently mentioned actors was in the type of actor. The actors mentioned more frequently by the students of both countries are (according to Vasiljuk & Budke, 2021) direct individual actors who represent their own interests. The less frequently mentioned actors are direct complex actors (also categorised according to Vasiljuk & Budke, 2021) who represent the interests of a larger institution. Students therefore seem to find it easier to name direct individual actors in their texts. One possible reason for this difference could be that students are closer to the interests and perspectives of direct individual actors than they are to direct complex actors. For example, preferring to be able to use a green space for leisure activities (perspective of local residents) could be easier to understand, as it is closer to the students' everyday lives than the fear that parts of the ecosystem could be affected by the expansion of the training ground (perspective of the NABU Employee). Maier and Budke (2017, p. 58) also suggest that it could be helpful to train teachers to help students to empathise with the actors, e.g., by visualising their perspectives. One reason for the fact that direct individual actors were mentioned more frequently could also be that students tend to assign interests to individuals rather than organisations or interpret the interests of organisations as something objective and generally valid rather than the interests of an individual person. It has also been shown that the students adopt the arguments of the actors from the materials and use them as their own and formulate them in a neutral way. This means that perspectives are adopted.

The students in both countries hardly positioned the actors. However, when an actor was named in the student text and their position on the conflict was presented, it was always correct in both countries. It is therefore reasonable to assume that although the students understood the positions on the conflict, they often did not seem to be aware that the naming of positions is important for the description of a conflict, even though the actors and their actions and positions play a central role in a conflict. The results also showed that students from both countries sometimes bring their own experiences and prior knowledge into their argumentations. Even though the German students included more perspectives than the Ecuadorian students, the majority of students from both countries (about half from each country) only highlighted one perspective, although several perspectives were included in the material. Presenting different perspectives seems to be a challenge for many students. The reasons for this could be that it is a complex task and that the students have had little practice so far. However, in order to present the conflict, it is very important to shed light on several perspectives on an issue in order to present the controversy and to understand the conflict. One possible reason could be that students are not practised in thematising conflicts. For example, a textbook analysis by (Kuckuck, 2014, p. 76) found that conflicts are only addressed on around 2 % of the pages of German geography textbooks.

The materials mostly used by the students from both countries were the same types of materials. These materials had two things in common. Firstly, the more frequently used materials consisted at least in part of a continuous text. Secondly, at least one actor was depicted on the respective material. Transferring information from discontinuous texts to a continuous text seemed to be more difficult for the students than transferring information from continuous texts to their own continuous text. This could be due to the fact that with discontinuous texts, students have to be provided with greater interpretive guidance (Wey, 2022, p. 30). In addition, they may also lack a more fundamental linguistic competence to present the information from the materials linguistically. The approach of language-sensitive teaching (see, e.g., Budke & Kuckuck, 2017, p. 7ff.), which combines linguistic and subject-related learning and thus promotes both the students' linguistic competence and their subject knowledge, could be helpful here. The German students also commented that the materials were very extensive, which could also be a reason for the low utilisation of the information in the material. A previous study by Schwerdtfeger and Budke (2021, p. 31) came to a similar conclusion. The amount of material that students should be given in school lessons has hardly been empirically researched to date (Jost & Wieser, 2017, p. 29). In addition, a study by Steingröbl and Budke (2022, p. 10) also found that students' motivation in writing tasks seems low according to the teachers. Language-aware support materials have already been shown to be overall perceived as helpful by the students in geography lessons on a different topic in another study, but also that resources were used to varying degrees by students (Morawski & Georgakaki, 2024, p. 141ff.).

There was a greater difference in the naming of the conflict. Here, a larger proportion of German students clearly named and described the conflict. This was less clearly recognisable among the Ecuadorian students. In some cases, they misrepresented the content and sometimes used the term conflict, but did not describe the conflict in terms of content. This may therefore be due to a lack of knowledge, understanding or linguistic skills to clearly describe the conflict. Another difference in some cases was the content of the arguments. The Ecuadorian students, for example, wrote a little more frequently about air pollution and oxygen as well as about how families could be affected by the expansion. Cultural differences could have played a role here, as well as the students' prior knowledge, as other studies showed that newly obtained knowledge does not necessarily play an important role in the formulation of arguments (Budke et al., 2010, p. 68f.).

In summary, it can be said that students in both countries showed similar tendencies in almost all categories analysed. The study also showed that the task format of argumentative writing is in part a challenge for many students, as other studies on this topic have already found (Budke et al., 2020; Budke et al., 2021; Gebele et al., 2022; Hindmarsh & Budke, 2023; Schwerdtfeger & Budke, 2021). The mostly comparable trends in both skills and difficulties of students in argumentation indicate that cultural differences and differences in the school system seem to play a subordinate role when it comes to the students' argumentation skills. Most students in both countries were able to form their own opinion through the task and formulate it clearly in their texts. The main difficulties were in using all of the information available to them and in formulating their arguments precisely. In addition, they could have both named and positioned the actors more often. This shows that written, material-based, multi-perspective argumentation places a number of demands on the students, in which most of the students do not seem to be practised. The challenges posed by writing material-based, multi-perspective arguments appear to transcend national borders and seem largely independent of each country's specific context. But studies have also shown that argumentation skills can be improved through practice and/or targeted support (e.g., Härmä et al., 2021, p. 17; Osborne et al., 2004, p. 1015). This means that a greater focus should be placed on supporting students in the following areas. The students should be supported in naming and positioning all actors involved in the conflict (that are presented in the material). They especially need support in doing so when it comes to the complex actors that represent not their own interest but the interests of an

institution. The students must also state the reasons for the positions of the actors by explaining their arguments and thus presenting their perspectives. Here, too, they need support. In addition, the training should focus on dealing with materials that contain discontinuous text, such as maps, diagrams and tables.

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