Chapter 4

A STUDY OF THE ARGUMENTS USED
BY UNDERGRADUATE AND GRADUATE STUDENTS
DURING DISCIPLINARY DISCUSSIONS
IN THE CLASSROOM

Francesco Arcidiacono¹ and Antonio Bova²
¹University of Teacher Education (HEP-BEJUNE), Biel/Bienne, Switzerland
²Utrecht University, The Netherlands

ABSTRACT

This study sets out to examine how argumentative practices in the classroom evolve from undergraduate to graduate education. The focus is on the disciplinary discussions between the teacher and the students as well as among students, i.e., task-related discussions concerning the discipline taught in the course, with the aim to compare to what extent the arguments used by undergraduate and graduate students refer to scientific notions and theories related to the discipline taught in the course. The data corpus is constituted by 16 video-recorded lessons (about 24h of video) of two courses – one at undergraduate level and one at graduate level – in Developmental Psychology. The two courses were selected according to the following criteria: i) similar number of students, ii) similar disciplinary domain, iii) both courses are taught by the same teacher in English language. The analytical approach adopted to identify the students’ arguments relies on a qualitative methodology based on the pragma-dialectical ideal model of a critical discussion. The findings of this study show that the undergraduate students put forth fewer arguments than graduate students, and when they do so in most cases their arguments refer to common-sense knowledge and previous personal experience. On the other hand, the graduate students more frequently put forth arguments that refer to scientific notions and theories strictly or somehow related to the discipline taught in the course.
INTRODUCTION

The question concerning how the development of critical attitudes is achieved in social activities of thinking and learning, as well as in which conditions and situations, is crucial for researchers and practitioners in education (Muller Mirza & Perret-Clermont, 2009; Pontecorvo & Arcidiacono, 2007, 2014; Arcidiacono, Baucal & Budjevac, 2011; Baucal, Arcidiacono & Budjevac, 2011; Bova & Arcidiacono, 2013).

As argumentation and learning are connected because of their capacity to entail the emergence of new understandings and knowledge, a specific attention to the introduction of argumentative activities in educational settings is relevant and will be at the heart of this chapter. In our attempt to examine the evolution of argumentative practices in classroom from undergraduate to graduate education, we decided to focus on the disciplinary discussions between the teacher and the students as well as among students. These activities require a variety of social and rhetorical skills, both from teachers’ and students’ sides, as argumentation, at least from a cultural perspective, implies the commitment and the acceptance that social harmony can be backed up by a plurality of opinions, instead of authority and symmetry of positions.

The complexity of these activities in the classroom context is usually carried out by verbal exchanges, discussions and confrontation. In that respect, we assume that argumentation is nested in conversations in which knowledge is constructed, presented or assessed. The way to describe such processes that connect what is being said and what is being thought is often composite. Previous studies (e.g., Arcidiacono & Gastaldi, 2011; Arcidiacono, 2013; Baucal, Arcidiacono & Budjevac, 2013) have shown how conversations display and support the mutual scaffolding of the interactants’ ideas and the co-construction of new understandings.

Our specific focus on higher education is connected to two connotations of argumentative practices. Firstly, argumentation can be considered as an engagement in epistemic practices, as suggested by Kelly (2008): “the specific ways members of a community propose, justify, evaluate and legitimize knowledge claims within a disciplinary framework” (p. 99). Secondly, argumentation is a social process involving a pedagogical dimension (the critical thinking is a pedagogical process and a goal in the education activity) as well as a psychological one (argumentative interactions require socio-cognitive skills, as well as interpersonal and affective elements for negotiation of meanings). Evidences in this sense have been offered by different studies in the educational and psychological fields. For example, Asterhan and Schwarz (2007) have shown that instructing university students to engage in collaborative argumentation resulted in lasting learning gains, compared to students who were simply instructed to work together. The authors have shown that while these instructions created an overall learning effect, the dialogue was not always of a dialectical nature, and the deployment of the resulting dialogue was difficult to predict. This means that precise designs and adaptive management are needed in order to foster argumentative practices.

In this chapter we will integrate the perspective that different discursive activities (including argumentation) may foster thinking development (Larraín & Haye, 2012). In that sense, the argumentative analysis of verbal exchanges in classroom context opens the possibility to better understand ways through which teachers and students are challenged, stimulated to formulate ideas and explanations, and are asked to follow the articulation of
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others’ ideas. In order to present our contribution, the chapter is organized as follows. In the first part, a concise review of the most relevant literature on argumentation in learning contexts of higher education will be presented. Afterwards, the methodology on which the present study is based and the results of the analyses will be described. In the last part of the chapter, the results and the conclusions drawn from this study will be discussed.

**ARGUMENTATION STUDIES IN LEARNING CONTEXTS OF HIGHER EDUCATION**

Within the studies focusing on the argumentative practices in higher education, two main lines of research can be distinguished. The first one aims to identify the cognitive skills that can be enhanced through argumentative practices in the classroom. The results of these studies indicate that favoring argument debates in the classroom can improve students’ motivation and engagement (Hatano & Inagaki, 2003; Chin & Osborne, 2010; López-Facal, Jiménez-Alexandre & Arcidiacono, in press), and help them to detect and resolve errors (Schwarz, Neuman & Biezuner, 2000). Other studies have also shown that the engagement in constructing arguments enhances students’ knowledge by promoting a conceptual change (Wiley & Voss, 1999; Nussbaum & Sinatra, 2003; Pontecorvo & Arcidiacono, 2010), and that the engagement in argumentative small- or large-group discussions improves conceptual understanding (Alexopoulos & Driver, 1996; Mason, 1996, 2001; Andrews, 2009; Arcidiacono, 2014; Pontecorvo & Arcidiacono, 2014). Moreover, argumentative debates have been the core of research projects centered on the learning context of higher education. For instance, the SCOPE (Science Controversies Online: Partnerships and Education) project was aimed at facilitating students’ learning of science concepts as well as at understanding the nature of scientific inquiry by dealing with current scientific controversies (for more information, see Bell & Linn, 2000).

The second line of research aims at investigating students’ argumentative skills, and how such skills can favor or disfavor the learning process. In this respect, the role of argumentation in the academic context is currently stressed by a growing literature that emphasizes how students rarely use criteria that are consistent with the standards of the scientific community in order to determine which are the ideas to be accepted, rejected, or modified. For example, the work of Hogan and Maglienti (2001) and Linn and Eylon (2006) suggest that students often rely on inappropriate criteria such as the teacher’s authority or consistency with their personal beliefs to evaluate the merits of a scientific explanation. Other research suggests that students often do not use sufficient evidence (Sandoval & Millwood, 2005) or struggle to understand what counts as evidence (Sadler, 2004). Moreover, McNeill and Krajcik (2007) found that if students are confronted with large amounts of data, they often encounter difficulties differentiating between what is relevant and what is irrelevant.

Within the research strand on students’ argumentative skills, a series of studies have paid attention to the problem of constructing students’ knowledge, taking into account their previous beliefs (Driver, Newton & Osborne, 2000; Jiménez-Alexandre, Rodríguez & Duschl, 2000; Kelly & Takao, 2002; Sampson & Clark, 2008; Macagno & Konstantinidou, 2013). For instance, Alexander, Kulikowich and Schulze (1994) have shown that previous knowledge in the domain is a significant predictor of comprehension of the arguments.
advanced in support of a scientific theory. In a case study analysis of argumentative discourse among high school science students, Von Aufschnaiter and colleagues (2008) suggest that the quality of argumentation itself is mediated by students’ prior knowledge and familiarity with the content. Thus, high-level argument requires high-level knowledge of the content. According to the authors, students can engage effectively in argumentation only on content and levels of abstraction that are familiar to them. In the same vein, Sadler and Zeidler (2005) investigated the significance of prior knowledge of genetics for the argumentation of 15 undergraduate students on six cloning scenarios. The findings of this study indicated that students with more advanced genetics understanding demonstrated fewer instances of reasoning flaws, such as lack of coherence and contradiction of reasoning within and between scenarios, and were more likely to incorporate content knowledge in their argumentation than students with more a naïve understanding of genetics.

Taken together, despite differences in methodology and interpretation, the studies on the argumentative skills of students in the learning contexts of higher education have shown how students are able to understand and generate an argument, and to construct justifications in defense of an opinion. However, these studies have also shown that students often do not base their decisions to accept or reject an idea on available evidence and appropriate reasoning. Rather, students typically use inappropriate reasoning strategies to warrant one particular view over another and distort, trivialize, or ignore evidence in an effort to reaffirm their own ideas.

The present study intends to provide an innovative and relevant contribution to the recent literature on student-generated arguments in the learning contexts of higher education. For this reason, in the next sections of the paper, we will present a research design, as well as the main results, of a study devoted to examine how argumentative practices in classroom evolve from undergraduate to graduate education.

**METHODOLOGY**

**Corpus of Data**

The present investigation is part of a project devoted to the study of argumentative practices in the learning context of higher education in the Netherlands. The research design implies a corpus of sixteen video-recorded separate lessons of one Bachelor’s degree (sub-corpus 1) and one Master’s degree course (sub-corpus 2), constituting about 24 hours of video data. The length of each recording varies from 84 to 98 minutes. The two courses have been selected according to the following criteria:

i) similar number of students (about 15 students);
ii) similar disciplinary domain (both courses considered handle themes in the area of Developmental Psychology);
iii) both courses are taught by the same teacher in English language.

1 We are referring to the Research Project “Argumentation in the learning contexts of higher education. Comparing undergraduate and graduate classes in Psychology” (project no. P2TIP1_148347) funded by the Swiss National Science Foundation (SNSF).
Sub-corpus 1 consists of 8 video-recorded lessons of the third year elective course “Adolescent Development: Research, Policy, and Practice” of the Bachelor’s degree at the University College of Utrecht (UCU). Sub-corpus 2 consists of 8 video-recorded lessons of the first year elective course “Human Development and Developmental Psychopathology” of the Master’s degree program Development and Socialization in Childhood and Adolescence (DASCA) at the Utrecht University (UU).

Population

The sub-corpus 1 is constituted by 14 students, 4 boys and 10 girls. All the students at the time of data collection were in their early 20s (M = 21.80; SD = 1.80). There was no significance difference of age between boys (M = 21.89; SD = 2.66) and girls (M = 21.74; SD = 1.20). As for the students’ nationality, this class could be defined as very international. The students, in fact, came from 8 different countries: 7 from Netherlands, 1 from Finland, 1 from Mexico, 1 from Scotland, 1 from Germany, 1 from United States, 1 from Israel, and 1 from Austria. The sub-corpus 2 is constituted by 16 students, who were all girls. Most of the students at the time of data collection were in their early 20s (M = 23.00; SD = 1.60). As for the students’ nationality, the sub-corpus 2 was in large part composed from Dutch students (N= 12), and from only 4 students coming from abroad: 1 from Serbia, 1 from the United States, 1 from France, and 1 from Spain.

Detailed information on students constellations in sub-corpus 1 and sub-corpus 2 are presented below, in Table 1:

Table 1. Length of recordings, participants, average age, and nationality and gender of students

<table>
<thead>
<tr>
<th>Student group</th>
<th>Bachelor</th>
<th>Master</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of recordings in minutes</td>
<td>87–98</td>
<td>84–94</td>
</tr>
<tr>
<td>Mean length of recordings in minutes</td>
<td>93.37</td>
<td>91.14</td>
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</table>

<table>
<thead>
<tr>
<th>Participants</th>
<th></th>
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<tbody>
<tr>
<td>Girls</td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td>Boys</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Students, total</td>
<td>14</td>
<td>16</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Average age</th>
<th></th>
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<tbody>
<tr>
<td>Girls</td>
<td>21.74 (SD 1.20)</td>
<td>23.00 (SD 1.60)</td>
</tr>
<tr>
<td>Boys</td>
<td>21.89 (SD 2.66)</td>
<td>/</td>
</tr>
<tr>
<td>Students, total</td>
<td>21.80 (SD 1.80)</td>
<td>23.00 (SD 1.60)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nationality and gender of students</th>
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<th></th>
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<tbody>
<tr>
<td>STU1</td>
<td>Dutch, F</td>
<td>Dutch, F</td>
</tr>
<tr>
<td>STU2</td>
<td>Dutch, F</td>
<td>Dutch, F</td>
</tr>
<tr>
<td>STU3</td>
<td>Dutch, F</td>
<td>Dutch, F</td>
</tr>
<tr>
<td>STU4</td>
<td>Dutch, F</td>
<td>Dutch, F</td>
</tr>
<tr>
<td>STU5</td>
<td>Dutch, F</td>
<td>Dutch, F</td>
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</table>
Before starting the last lesson of the course (December 2013), both undergraduate and graduate students were asked (i) to rate in a scale from 1 (none) to 9 (excellent) their own ability to communicate in English language, (ii) if they had already took an academic course in Developmental Psychology, and (iii) to rate in a scale from 1 (none) to 9 (excellent) the level of their previous knowledge in Developmental Psychology, i.e., before taking the course (see Appendix A).

As for the ability to communicate in English language, in a scale from 1 to 9 the average score of the undergraduate students, according to their own perception, was $M = 8.28$, whilst the average score of the graduate students was slightly lower ($M = 7.56$). The most part of the students did already take an academic course in Developmental Psychology, both undergraduate (Yes $N = 12$; No $N = 2$) and graduate level (Yes $N = 15$; No $N = 1$). In regard to the level of their previous knowledge of the discipline taught in the course, in a scale from 1 to 9 the average score of the undergraduate students, according to their own perception, was slightly lower ($M = 6.35$) than graduate students ($M = 7.25$).

### Video Recording, Transcription Procedures and Ethical Issues

For each course, eight lessons over a twelve-week period during the Fall 2013 semester were videotaped. In order to capture the interactions between students and teacher and among students, the whole classroom was videotaped by placing one camera in a back-side corner of the classroom. Each lesson was recorded in its entirety.

All lessons have been fully transcribed using the CHILDES standard transcription system CHAT\(^2\) (MacWhinney, 2000), with some modifications introduced to enhance readability (see Appendix B). Transcriptions have been revised by two researchers until a high level of consent (agreement rate = 90%) has been reached. All turns have been numbered progressively within the discussion sequence. Participants have been identified by role for the

<table>
<thead>
<tr>
<th>Student</th>
<th>Gender</th>
<th>Age Group</th>
<th>Nationality</th>
</tr>
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<tbody>
<tr>
<td>STU6</td>
<td>Dutch, M</td>
<td>Dutch, F</td>
<td></td>
</tr>
<tr>
<td>STU7</td>
<td>Dutch, F</td>
<td>Dutch, F</td>
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<tr>
<td>STU8</td>
<td>Finnish, F</td>
<td>Dutch, F</td>
<td></td>
</tr>
<tr>
<td>STU9</td>
<td>Mexican, F</td>
<td>Dutch, F</td>
<td></td>
</tr>
<tr>
<td>STU10</td>
<td>Scottish, M</td>
<td>Dutch, F</td>
<td></td>
</tr>
<tr>
<td>STU11</td>
<td>German, F</td>
<td>Dutch, F</td>
<td></td>
</tr>
<tr>
<td>STU12</td>
<td>American, M</td>
<td>Dutch, F</td>
<td></td>
</tr>
<tr>
<td>STU13</td>
<td>Jewish, F</td>
<td>Serbian, F</td>
<td></td>
</tr>
<tr>
<td>STU14</td>
<td>Austrian, M</td>
<td>American, F</td>
<td></td>
</tr>
<tr>
<td>STU15</td>
<td>French, F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STU16</td>
<td>Spanish, F</td>
<td></td>
<td></td>
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</tbody>
</table>

\(^2\) The CHAT system provides a standardized format for producing computerized transcripts of face-to-face conversational interactions for the Child Language Data Exchange System (CHILDES). The system provides options for basic discourse transcription as well as detailed phonological and morphological analyses. Verbal utterances and nonverbal expressions with a clear communicative function relevant to the meal activity were identified in the transcription.
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teacher (e.g., TEACH) and by role, number, and gender (M = male, F = female) for student (e.g., STU1M, STU2F, STU3F, etc.).

All participants were approached by means of an information sheet outlining in clear language the general purpose of the study and providing information about how the video data would be used (see Appendix C). Consent letters have been written in accordance with Dutch Association of Psychologists (NIP) and American Psychological Association (APA) guidelines, specifically the format outlined in the sixth edition of the Publication Manual of the American Psychological Association (APA, 2009) (see Appendix D). In line with the ethical framework guiding the research, transcriptions and video-recorded material have been treated in the strictest confidence and seen only by researchers.

**ANALYTICAL APPROACH**

**The Ideal Model of a Critical Discussion**

The theoretical tool adopted for the analysis is the pragma-dialectical ideal model of a critical discussion (van Eemeren & Grootendorst, 2004). This approach considers that argumentative speech acts are not performed in a social vacuum, but between two or more parties who are having a disagreement and interact with each other in an attempt to resolve the disagreement.

The ideal model of a critical discussion spells out four stages that are necessary for a dialectical resolution of differences of opinion:

- At the *confrontation stage*, it is established that there is a dispute. A standpoint is advanced and questioned.
- At the *opening stage*, the decision is made to attempt to resolve the dispute by means of a regulated argumentative discussion. One party takes the role of protagonist, which means that he/she is prepared to defend his/her standpoint by means of argumentation; the other party takes the role of antagonist, which means that he/she is prepared to challenge the protagonist systematically to defend his/her standpoint.
- At the *argumentation stage*, the protagonist defends his/her standpoint and the antagonist elicits further argumentation from him/her if he/she has further doubts.
- At the *concluding stage*, it is established whether the dispute has been resolved on account of the standpoint or the doubt concerning the standpoint having been retracted.

This model is assumed, in the present study, as a grid for the analysis, since it provides the criteria for the selection of the argumentative discussions and for the identification of the arguments put forth by students.

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3 In line with other scholars (Newton, Driver & Osborne, 1999; Stein & Albro, 2001; Osborne, 2005), in this study the term “argument” refers to the artifacts that a student creates to articulate and justify his/her standpoint, whereas the term “argumentation” refers to the process of constructing these artifacts.

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Selection of Argumentative Discussions

Only the discussions that fulfill two of the following three criteria, one between i.a and i.b and always the ii., were selected for analysis:

i.a at least one standpoint concerning an issue related to the discipline taught in the course put forth by one or more students is questioned – either by means of a clear disagreement or by means of a doubt – by the teacher or by (at least) one classmate;

i.b at least one standpoint concerning an issue related to the discipline taught in the course put forth by the teacher is questioned – either by means of a clear disagreement or by means of a doubt – by one or more students;

ii. at least one student advances an argument either in favor of or against the standpoint being questioned.

The argumentation data for each session were obtained by reviewing both the video recording and the corresponding transcript. In a first phase, all the argumentative discussions between students and teacher or among students arisen around an issue related to the discipline taught in the course (occurred in the corpus of sixteen separate lessons) were selected (N = 94). Subsequently, for the scope of the present study, we selected the argumentative discussions in which at least one student advanced at least one argument either in favor of or against the standpoint being questioned (N = 66).

Criteria Used to Identify and Distinguish Students’ Arguments

In order to identify the arguments put forth by students, the analysis is focused on the third stage of the model of a critical discussion, i.e., the argumentation stage. In this stage the interlocutors exchange arguments and critical reactions to convince the other party to accept or to retract his/her own standpoint: “The dialectical objective of the parties is to test the acceptability of the standpoints that have shaped the difference of opinion” (van Eemeren & Grootendorst, 1992, p. 138). All the transcriptions of the lessons were read independently by two coders who then met to compare their analysis and resolve differences in interpretation. The two raters read the transcript independently to identify the arguments that were advanced by the students and the teacher; the percentage of agreement between the two raters was 83%.

Once identified, the arguments put forth by students were distinguished according to the following two criteria:

- the argument refers to scientific notions and theories strictly or somehow related to Developmental Psychology (hereafter, SCIENCE ARG);
- the argument refers to student’s personal experience or to any other information that does not refer to scientific notions and theories strictly or somehow related to Developmental Psychology (hereafter, NO SCIENCE ARG).

An example of SCIENCE ARG is the second part (in *Italic*) of the following discourse by a student: “I think that Piaget’s notion that children’s development must necessarily precede..."
their learning is wrong, because according to Vygotskij, learning is a social phenomenon and it come before development”. An example of NO SCIENCE ARG is, instead, the first part (in Italic) of the following discourse by another student: “In my school, bullies were above all rich and spoiled guys. I wouldn’t say that bullies typically come from poor families”.

RESULTS

In our corpus, the graduate students advanced arguments in support of their standpoint more frequently than the undergraduate students. Within the total of N = 66 argumentative discussions we have analyzed, the undergraduate students have advanced at least one argument in N = 23 discussions, for a total number of N = 75 arguments (average number of arguments advanced during an argumentative discussion N = 3.26). These arguments were in most cases advanced during student-to-student interactions (N = 51; 68%), whilst a fewer number of arguments were observed during student-teacher interactions (N = 24; 32%). The graduate students advanced at least one argument in N= 43 discussions, for a total number of N = 167 arguments (average number of arguments advanced during an argumentative discussion N = 3.88). Similar to what was observed in regard to undergraduate students, a higher number of arguments were found in student-to-student interactions (N = 95; 57%) than in student-teacher interactions (N = 72; 43%).

A detailed description of the number of arguments put forth by undergraduate and graduate students is presented below, in Table 2. In order to present the results of our study, we will refer to a selection of excerpts of talk-in-interaction that are representative of the results obtained from the larger set of analyses conducted on the whole corpus of students’ arguments.

<table>
<thead>
<tr>
<th>Table 2. Contributions of undergraduate and graduate students in argumentative discussions in the classroom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argumentative discussions in which (at least) one student put forth (at least) one argument</td>
</tr>
<tr>
<td>Arguments put forth by students</td>
</tr>
<tr>
<td>Average number of arguments advanced during an argumentative discussion</td>
</tr>
<tr>
<td>Arguments put forth by students during student to student interactions</td>
</tr>
<tr>
<td>Arguments put forth by students during interactions with their teacher</td>
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</tbody>
</table>

Undergraduate Students’ Arguments

The findings show that in large part the undergraduate students put forth NO SCIENCE ARG (N = 66; 88%), both in interactions with their classmates (N = 50 out of N = 51 total
arguments put forth in interactions with their classmates) and with the teacher (N = 16 out of N = 24 total arguments put forth in interactions with their teacher). In the following example we will observe how an undergraduate student (STU2F) put forth a NO SCIENCE ARG (in Italic in the excerpt, in line 9: “there is not a mother that would accept to kill her son. It is not culture it is the nature of human beings”) to oppose a NO SCIENCE ARG (in Italic, in line 2: “otherwise slavery wouldn’t have been permitted. At a certain time, at a certain place, it was possible”; and in line 4: “at a certain time, at a certain place, it was possible”) previously advanced by one of her classmate (STU14M) during a discussion favored by the teacher concerning the cultural approach and its implications:

Example 1
Lesson 3. Min. 38:12. Participants: teacher (TEACH), students (STU2F; STU14M). All the tables are placed in a horseshoe shape with the students facing the teacher. All students are seated at their own table. STU2F sits on the right hand side of TEACH, whilst STU14M is seated facing TEACH.

1. *TEACH: according to the cultural approach, all the values, what is right or what is wrong is cultural specific, they depends on culture [...] what do you think about this?
2. *STU14M: yes, is right. otherwise slavery wouldn’t have been permitted
3. *TEACH: yes, good point
4. *STU14M: at a certain time at a certain place, it was possible
5. *TEACH: right
6. %pau: 2.0 sec
7. *STU2F: not everything, though
8. *TEACH: what?
9. *STU2F: not everything is acceptable. there is not a mother that would accept to kill her son. it is not culture it is the nature of human beings

In the corpus, undergraduate students put forth SCIENCE ARG almost exclusively in interactions with their teacher (N = 8 out of N = 9 total SCIENCE ARG put forth in interactions with their teacher). An example of use of this type of argument is the following discussion concerning the moral development during adolescence:

Example 2
Lesson 4. Min. 59:50. Participants: teacher (TEACH), student (STU6M). All the tables are placed in a horseshoe shape with the students facing the teacher. All students are seated at their own table. STU6M sits on the right hand side of TEACH.

1. *STU6M: adolescents’ behaviors are very often more mature than adults’ ones
2. %pau: 3.0 sec
3. *TEACH: no:
4. *STU6M: oh. yes professor ((laughing))
5. *TEACH: adolescence typically has more dangerous behaviors than adults
6. *STU6M: but Kohlberg said that adolescents can normally respect authority and rules, and that’s pretty good

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7. *TEACH: yes, but […]

In this example, there is a difference of opinion between the teacher and a student (STU6M): according to the student, adolescents’ behaviors show to be very often more mature than adults’ ones, whilst the teacher disagrees with her student’s opinion (line 3: “no::”) and puts forth an argument in support of her standpoint (line 5: “adolescence typically have more dangerous behaviors than adults”). In turn, the student advances a SCIENCE ARG that refers to the Kohlberg’s theory of moral development in order to support his own opinion (line 6: “but Kohlberg said that adolescents can normally respect authority ad rules, and that’s pretty good”).

Graduate Students’ Arguments

Unlike from what was observed for undergraduate students, the findings show that slightly more than half of the all arguments put forth by graduate students were SCIENCE ARG (N = 87; 52%). These arguments were used a little more frequently in student-teacher interactions (N = 46 out of N = 72 total arguments forth in interactions with their teacher) than in student-to-student interactions (N = 41 out of N = 95 total arguments put forth in interactions with their classmates).

In the following example, an argumentative discussion having as protagonists the teacher and one student, STU10F, occurred during a lesson centered on the development of identity and personality in adolescence. The teacher explains that the adolescents face a phase in which they are committed to choose their values and goals for the future (line 1). The student is in disagreement with the claim made by her teacher, and in turn she advances a SCIENCE ARG in support of her opinion (line 2: “some adolescents decide not to choose, according to Marcia it’s the identity diffusion, they are not ready to take these decisions”). The discussion continues with the teacher that accepts the argument advanced by the student (line 3: “this is true, some of them don’t”) and reformulates her previous claim accordingly (line 4).

Example 3
Lesson 6. Min. 32:15. Participants: teacher (TEACH), student (STU10F). All the tables are placed in a round shape, and all students are seated at their own table. The teacher is seated together with the students. STU10F sits on the left hand side of TEACH.

1. *TEACH: during this phase ((adolescence)) they ((adolescents)) have to decide their goals and values for their future
2. *STU10F: some adolescents decide not to choose though, according to Marcia it’s the identity diffusion, they are not ready to take these decisions
3. *TEACH: this is true, some of them don’t
4. *TEACH: they are supposed to choose their values and goals

As far as NO SCIENCE ARG are concerned, graduate students used these arguments more frequently during student to student interactions (N = 54 out of N = 95 total arguments put forth in student to student interactions) than during the interactions with their teacher (N = 26 out of N = 72 total arguments forth in student-teacher interactions). AN example of this
type of argument is the following discussion, whose beginning is initially favored by the teacher, about mental disorders in adolescence and the moment of their actual initiation.

Example 4

Lesson 2. Min. 24:30. Participants: teacher (TEACH), students (STU15F; STU1F). All the tables are placed in a round shape, and all students are seated at their own table. The teacher is seated together with the students. STU15F sits on the left hand side of TEACH, whilst STU1F is seated on the opposite side of STU15F.

1. *TEACH: when is an actual initiation of a ((mental)) disorder? is it when you see some first symptoms or when you see the disorder, when is really labeled as a disorder?
2. *STU15F: you need to have a predisposition, because the genes produce a predisposition to have that:: it’s before the manifestation
3. *STU1F: it’s different for disorders. even if you have a predisposition it can still go in multiple ways. I know people who were depressed and now they are not

Here, the argumentative discussion involves two students: STU15F and STU1F. According to the first student, the actual initiation of a mental disorder is before the manifestation, and she supports her opinion by advancing a NO SCIENCE ARG based on common sense knowledge (line 2: “you need to have a predisposition, because the genes produce a predisposition to have that:: it’s before the manifestation”). On the other hand, the second student claims that having a predisposition is fundamental only for certain mental disorders, not for all of them, since it can still go in multiple ways. In particular, she supports this claim by also advancing a NO SCIENCE ARG that is based on her own personal experience (line 3: “I know people who were depressed and now they are not”).

The presentation of different short excerpts concerning the types of arguments used by the two groups (sub-corpus 1 and sub-corpus 2) of students shows an interesting element that can summarize the argumentative choices (and strategies) used with their classmates and with their teacher (Table 3).

<table>
<thead>
<tr>
<th></th>
<th>Bachelor’s Students</th>
<th>Master’s Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCIENCE ARG</td>
<td>in Student-to-Student Interaction</td>
<td>in Student-to-Student Interaction</td>
</tr>
<tr>
<td>N = 9; 12%</td>
<td>N = 1</td>
<td>N = 41</td>
</tr>
<tr>
<td>in Student-Teacher Interaction</td>
<td>N = 8</td>
<td>N = 46</td>
</tr>
<tr>
<td>NO SCIENCE ARG</td>
<td>in Student-to-Student Interaction</td>
<td>in Student-to-Student Interaction</td>
</tr>
<tr>
<td>N = 66; 88%</td>
<td>N = 50</td>
<td>N = 80; 48%</td>
</tr>
<tr>
<td>in Student-Teacher Interaction</td>
<td>N = 16</td>
<td>N = 54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N = 26</td>
</tr>
</tbody>
</table>

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DISCUSSION

The findings of this study indicate that undergraduate students draw their arguments from common sense and personal experience more often than graduate students. In turn, graduate students put forth arguments that refer to scientific notions and theories strictly or somehow related to the discipline taught in the course, i.e., Developmental Psychology, more often than undergraduate students. In our view, two reasons can mainly contribute to explain these results.

The first reason is the actual students’ knowledge of the discipline taught in the course, i.e., Developmental Psychology. As we have observed in the excerpt 3, graduate students use as an argument a limited, well-specific aspect of a scientific theory in order to support their own standpoint. Moreover, they are able to engage in critical discussions related to the different theories that treat certain limited aspects of a certain topic discussed during the lessons. On the other hand, the knowledge in Developmental Psychology of the undergraduate students is often limited to a more superficial knowledge of the discipline. For example, in the excerpt 2 a student has advanced a SCIENCE ARG that refers to a psychological theory of moral development (Kohlberg, 1984), claiming that according to this theory adolescents can normally respect authority and rules. Evidently, the student is referring to the “stage four” of Kohlberg’s theory of moral development, however without mentioning it correctly. Accordingly, even though the students of both groups - according to their own perception - seems to have a similar knowledge in Developmental Psychology, graduate students had a knowledge of the discipline much higher than undergraduate students, even more than what was claimed in the answers to the short questionnaire (graduate students M = 7.25 vs. graduate students M = 6.35).

The second reason is related to the institutional commitment requested to the students. Looking at the questions used by the teacher to favor the beginning of argumentative discussions, we have observed some differences. At the undergraduate level, the teacher asks open questions to her students. These questions can favor a large discussion with and among students, and they are not focused on limited and specific aspects of a theory, but, instead, they aim to favor a discussion around a more general topic. The focus of the discussion is not the single theory, but the more general topic (What are the main reasons leading to episodes of bullying among adolescents? How can the family relationships affect the adolescent development? What are the consequences of adolescent drinking and substance use?). At the graduate level, instead, the teacher asks questions that refer to specific aspects of a certain theory, often followed by a further why-questions asked to the students. Here, students are expected to provide the reasons at the basis of their own opinions (What are the most important processes that, according to Steinberg, explain the fact that many risk behaviors tend to peak in adolescence? Why? Which developmental processes can be studied by each of the seven models described by Graber and Brooks-Gunn and how? Why? What are the advantages and disadvantages of a person-centered approach? Why?). Accordingly, it seems that at the undergraduate level students are requested to be interested in and curious of the discipline taught in the course by asking questions. At the graduate level, curiosity is not enough. Students are expected to support their standpoints - and even a mere doubt - by advancing arguments that have to refer to scientific theories.

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CONCLUSION

Argumentative interactions in the context of higher education cannot be explained only by employing inferential instruments of analysis, but should be accounted for in terms of complex interactive sociocultural situations. In the context of classroom, knowledge is the main target of argumentative interaction, although, nevertheless, cognitive activities are often aimed at the acquisition of different expertise. For this reason, educators have to be interested in what happens during and after the deployment of argumentative interactions, because learning can be experienced as an emergent process deployed in the argumentative discourse, and as a new resource, knowledge, belief or position that can be useful for further activities in and outside the classroom.

We would like to underline that the use of argumentation theories and analytical models cannot consider the context as given: it is needed to focus on the design, on the context of interaction between teachers and students, in order to provide affordances for productive argumentation to emerge. The contextualization of argumentation (Rigotti & Rocci, 2006; Arcidiacono et al., 2009) is fundamental in the educational setting, in which changes in knowledge perceived after argumentation have to be treated as the result of a complex set of activities and dimensions at the pedagogical and psychological levels.

APPENDIX A

Teacher-Student Dialogue in the Academic Context

This project will investigate dialogues between students and professors during university lessons. The dialogues will be video and audio recorded. The recordings will, in first instance, be transcribed and analyzed. These recordings will not be shown to the general public.

Below are few questions. Please fill in the appropriate square for questions 1-7. Please DO NOT WRITE YOUR NAME ON THE QUESTIONNAIRE AS THIS STUDY IS ANONYMOUS. Do not feel obligated to answer all questions if you are uncomfortable or unable to do so. Thank you very much for taking the time to complete the present questionnaire, your effort is greatly appreciated.

Please contact me if you require further information about the project, or to have any questions answered. Thank you for taking the time to read this information.

Your with best wishes,

Xxxxxxxxx Xxxxxxxx

Date: December 10, 2013
Telephone: 030 25X XX XX
E-mail: X.Xxx@xx.xx

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Please answer the following questions:

Are you a girl or a boy?
- Girl ☐
- Boy ☐

When were you born?
- a) Month
  - January ☐
  - February ☐
  - March ☐
  - April ☐
  - May ☐
  - June ☐
  - July ☐
  - August ☐
  - September ☐
  - October ☐
  - November ☐
  - December ☐
- b) Year
  - 1985 ☐
  - 1986 ☐
  - 1987 ☐
  - 1988 ☐
  - 1989 ☐
  - 1990 ☐
  - 1991 ☐
  - 1992 ☐
  - 1993 ☐
  - 1994 ☐
  - 1995 ☐
  - Other 19….______

Where were you born?
- The Netherlands ☐
- Other ___________________

What is your first language?
- English ☐
- Non-English ☐

Rate your ability to communicate in English
- None 1 2 3 4 5 6 7 8 9 Excellent

In your previous study experience, did you already take an academic course in Developmental Psychology?
- Yes ☐
- No ☐

Rate your knowledge in Developmental Psychology before the beginning of this course
- None 1 2 3 4 5 6 7 8 9 Excellent

**APPENDIX B**

**Transcription Symbols**

The transcript includes adaptation of CHAT system in using the following conventions:
- * indicates the speaker’s turn
- [...] not-transcribed segment of talking

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APPENDIX C

Teacher-Student Dialogue in the Academic Context

Information Sheet
This project will investigate dialogues between students and professors during university lessons. The dialogues will be video and audio recorded. The recordings will, in first instance, be transcribed and analyzed. These recordings will not be shown to the general public, but short excerpts maybe used for educational purposes.

If you have concerns about your anonymity being maintained, you may ask for your faces to be blurred. Individual information and data obtained are not accessible to third parties outside our research group. You may retain this information sheet for reference. Please feel free to ask any questions you may have before completing the consent form (which will be stored separately from the anonymous information you provide for the research project).

Please contact me if you require further information about the project, or to have any questions answered. Thank you for taking the time to read this information.

Your with best wishes,

Xxxxxxx Xxxxxxx

Telephone: 030 25X XX XX

E-mail: X.Xxxxxx@xx.xx

APPENDIX D

Teacher-Student Dialogue in the Academic Context

Consent form

I ________________ consent to Xxxxx Xxxx carrying out the following:

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1. recording (audio and video) lessons on approximately 8 occasions over a eight week period;
2. transcribing and analyzing the recordings of lessons;
3. using short recorded excerpts for educational purposes.

I have received an information sheet explaining the general purpose of the study and of the opportunity to ask further questions and with the assurance that the rights to my privacy and confidentiality will be respected at all times.

Date: ____________________ Signed: ____________________________

REFERENCES


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