S-TEAM

Developing Argumentative Competence:
An introduction
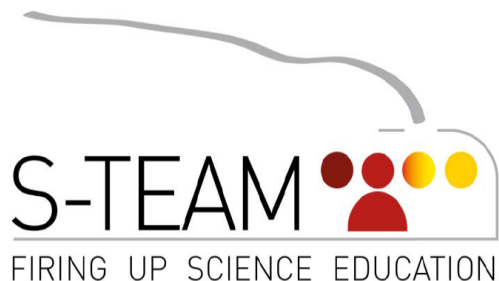
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S-TEAM

S-TEAM Deliverable 7a: Argumentative competence: how to develop it?

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Table of contents

Preface

Work Package 7 (WP7) is led by Universidade de Santiago de Compostela (USC), in association with the University of Bristol, Kaunas University of Technology and the University of South Bohemia. It will provide resources and strategies to help teachers to create learning environments for argumentation and the learning of discursive practices in science.

WP7 will disseminate training resources and classroom materials to support the teaching and learning of argumentation in science classrooms and the development of teachers' reasoning about the nature of scientific knowledge. Professional development programmes will be designed and implemented to promote coherence and growth in teachers' skills in these aspects. Outcomes in terms of students' argumentation skills will provide proof of the effectiveness of professional development interventions.

This document is the first production by WP7 and is intended to provide a basic introduction to the classical skills and terminology of argumentation, or 'rhetoric'. These skills are frequently ignored in contemporary European classrooms, or at least are not explicitly taught. This is especially unfortunate in respect of student teachers in science subjects. Argumentation is increasingly seen as a core skill in science[1] as well as being a transferable skill with applications across many disciplines.

This concise introduction to argumentation from our colleagues in Kaunas therefore fulfils an essential requirement for learning about argumentation, and will be of use to student teachers, teacher educators and curriculum developers. Subsequent materials from WP7 will develop the application of argumentation within science classrooms and of course with strong reference to inquiry based science teaching methods.

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[1] See, e.g. Erduran & Jiménez Aleixandre (2008)

Introduction

A central task of education is seen to be the preparation of students for lifelong learning. The competencies of argumentation are an important part of this because these competencies are necessary both to understand and participate in discourse. The concept of argumentation shows many connections to basic research in the field of cognitive psychology, philosophy, and linguistics, especially to research programmes of "inductive and deductive logical reasoning", "causal reasoning", "abductive reasoning", "Bayes reasoning", "adaptive thinking", or "intuitive deciding" (Gigerenzer, 2000). Reinmann-Rothmeier & Mandl (1998) found in a Delphi-study that skills for evaluating knowledge and information represent the most important basic skills within a knowledge society. Shapiro and Hughes (1996) saw such skills as part of information literacy.

Recent approaches in instruction link argumentation with collaborative knowledge construction (e.g. Fischer et al, 2002). From this perspective, argumentation is not just the goal per se, but also a tool for knowledge acquisition. Authors regard the active participation in high-quality, argumentative discourse in formal instructional settings as an important condition of the development of these competencies (Kuhn, 1991). During collaboration, arguments are exchanged and cooperation partners examine and evaluate these arguments. Argumentative skills are not only a prerequisite of collaborative knowledge construction but also a learning goal during collaboration. H. Astleitner (2003) stated that the acquisition of argumentation skills is important for school achievement, that such skills can be trained, and that they must be trained within a carefully designed learning environment, but also, that there are many shortcomings in daily practice at present. However, studies showed that argumentative quality in discourse is often weak. Browne (2000) reported that about 80 percent of US undergraduates used the Internet for daily study and that they were often confronted with the evaluation and reconstruction of information and statements. Such problems raised from decontexualized, incomplete, unreliable, hidden, or contradictive statements. Analyzing such statements requires skills in argumentation, especially in evaluating statements.

The many overlapping and contradicting concepts within this area are different from the concept of argumentation in several ways:

a) They are based on methods of formal logic (e.g., predictive logic) and are not embedded within everyday contexts and language;

b) They only consider some parts of argumentation skills on a micro level without covering the whole process of argumentation including identification, construction, and evaluation of arguments; and

c) They do not deal with the question of how argumentation can be improved by instructional methods.

Authors of theoretical approaches assume that argumentation can be supported successfully when learners are building arguments actively and based on criteria, when they represent typical elements of arguments and argument chains within their memory, and when they use context cues for building arguments. Learning how to argue represents no major issue in traditional teacher education, although there are effective courses available (Astleitner, 2003). A one-day-workshop, which consisted of instruction in argumentation and of planning and evaluating of school lessons was able to improve teaching behavior significantly (Cleland et al, 1999), as well when groups of teachers had to work on important educational problems of daily instruction (Daniel, 2001). Such problems were embedded in case histories and had to be solved by dialogue between teachers. These dialogues were based on own experiences, on integrating the viewpoints of others, on searching for causal explanations, and on real contexts.

Objectives

- To analyze the concepts of 'argument', 'argumentation';

- To clarify the types of arguments and argumentation;

- To define personal argumentative skills while referring to the preliminary rubric for argumentation skills.

Relevance of Argumentative competence

Argumentative competence has a direct influence on the successful human career path, enables him/her to work effectively, communicate reasonably, and to lead an intellectually active life.

It is still possible to state, however, that the majority of our students lack argumentation skills. For this reason, a great number of them experience frustration whilst defending their opinion in public. Secondary school is the place where students should learn how

perform argumentative reasoning, how to conduct interviews, how to debate, to participate in a dispute, how to negotiate, etc.

1. The basics of arguments

An **argument** is a set of statements that attempts to demonstrate the truth of something by providing reasons in support of its main claim. However, the set of statements involves a particular sequence in which the statements are arranged. The statements are linked, one to another, in a specific way so that the final statement can be seen to rest clearly on those that went before it. In an argument, each statement leads to or implies the final statement. Argument can be either a process or a product. Argument is examined as a product -- a line of reasoning that justifies a claim. Here, argument is examined as a social process that people engage in when they debate opposing claims. The two kinds of argument are not unrelated, however. Arguments as products contain implicit two-sided process arguments that weigh support for and against a claim, compared to support for and against alternatives to the claim (Kuhn, 1991).

An "**argument**" is something that can be stated as proof or as confirmation of a statement (see Leitao, 2001).

Criteria for a good argument:

- validity;

- soundness;

- rigour;

- formal proof;

- based on inference rules of formal logic;

- clear causality.

Validity
- *Validity* means that the logical form or structure of the argument is just fine, but the premises *may* not be. A valid argument should be *compelling* in the sense that it is capable of convincing someone about the truth of the conclusion.

- However, such a criterion for validity is inadequate or even misleading since it depends more on the skill of the person constructing the argument to manipulate the person who is being convinced and less on the argument itself.

Soundness

- *Soundness* means both that the logical structure of the argument is valid, and that the premises are all true.

Rigour

- Intellectual rigour is an important part, though not the whole, of intellectual honesty — which means keeping one's convictions in proportion to one's valid evidence.

Formal proof

- A **formal proof** is a complete rendition of a mathematical proof within a formal system.

A rule of inference

- **A rule of inference** is a scheme for constructing valid inferences. These schemes establish syntactic relations between a set of formulas called *premises* and an assertion called a *conclusion*.

- These syntactic relations are used in the process of inference, whereby new true assertions are arrived at from other already known ones. Rules also apply to informal logic and arguments, but the formulation is much more difficult and controversial.

Syllogism

- An argument where the truth of the premises guarantees the truth of the conclusions.

- The syllogism is composed of major premise; minor premise: conclusion.

Classical Types of Arguments

- Logos (logical: e.g. deductive, inductive arguments)

- Ethos (e.g. ethical decisions)

- Pathos (e.g. emotional impact)

or

- Rational

- Emotional

- Factual

Structure of an Argument

Premises + reasoning → the conclusion

For e.g.:

- X is a book.

- All books have pages in them.

- Therefore, X has pages in it.

Premises:

The starting points of an argument.

They are assertions we must assume to be true in order for the argument to get off the ground.

Any statements that we have to make which are not themselves proven at the moment.

Premises may be incontrovertible pieces of knowledge; or they may be hypotheses that we make 'for the sake of argument...'

Inference:

- The transition or movement from premises to conclusion, the logical connection between them, is the inference upon which the argument relies.

Conclusion

- The *conclusion* is whatever proposition of the argument one is attempting to prove. The conclusion may then be used as a premise in a later argument.

"**Argumentation**" represents a process in which arguments are developed and stated through the usage of language.

Concept of argumentation:

- The process of developing or presenting an argument.

- **Argumentation** is the study of how humans can, do, and should reach conclusions through logical reasoning, that is, claims based on premises.

The construct of **argumentational integrity** (**fairness**) specifies criteria for an ethical evaluation of contributions to argumentational discussions that have been theoretically explicated and empirically validated in the form of conditions, characteristics, and standards of (un)fair argumentation (Groeben, Schreier,&Christmann, 1993; Schreier, Groeben,& Christmann, 1995)..

The explication of the construct of argumentational integrity is based on a (primarily) prescriptive use of argumentation. Argumentation is conceptualized as a conversation type in which the participants attempt to find a solution to a controversial issue (requirement) by means of a partner/listener-oriented exchange of views (process) that is based on (good) reasons (goal) and made acceptable to all participants (in a cooperative manner) (goal).

To potentially reach the two (prescriptive) characteristics of rationality and cooperation, which are contained within the specifications of the two goal dimensions, we suggest that contributions to **argumentative discussions** must meet the following four **conditions**:

- formal validity,

- sincerity/ truth,

- justice on the content level, and

- procedural justice.

The adherence to these conditions was defined as fair argumentation, their conscious violation as unfair argumentation.

For **successful argumentation**, the following elements are necessary (see LeBlanc, 1998; Walton, 1989):

a) to identify arguments and their elements, i.e., simple and complex statements (negation, conjunction, disjunctions, and conditions), their relationships (equality, contradiction, and independence) and their positions within arguments (premises and conclusions);

b) to construct arguments and their elements, i.e., to produce complete chains of arguments, especially to build main conclusions and to add missing (or implicit) premises or conclusions; and

c) to evaluate arguments and their elements, i.e., to proof the relevance, validity, reliability, truth, etc. of an argument; to identify criteria for evaluation in respect to their relevance for application; and to find and prevent from formal and informal errors in argumentation (invalid arguments, vicious circles, etc.).

There are **four characteristics of unfair argumentation** that specify what classes of speech acts constitute violations of the integrity criterion (Schreier & Groeben, 1990, 1992, 1996):

- faulty arguments,

- insincere contributions,

- unjust arguments, and

- unjust interactions.

The definition of unfair argumentation as the conscious violation of the argumentational conditions implies that an unfairness evaluation necessarily presupposes the presence of the two components:

(a) argumentational rule violation and

 (b) subjective awareness.

Valence of argumentational rule violations includes distortion of meaning, hindrance of participation, discrediting of others, etc.) and subjective facts (degrees of subjective awareness in committing a rule violation). Consequently, not every combination of objective and subjective facts leads to an evaluation as unfair. The negligent use of a faulty argument might not be considered as unfair whereas the intentional use of such an argument might well be so.

The valence (severity) of an argumentational rule violation and the degree of subjective awareness in committing such a violation were designated as basic components of the unfairness evaluation, which is conceptualized as a verdict in the sense that the respective speaker is regarded as being guilty of having violated the argumentational rules. It was demonstrated that the probability of an unfairness verdict increases with the severity of a rule violation and the degree of subjective awareness (e.g., Groeben et al., 1992).

Linear Argumentation:
- Fact – opinion – sentiment

- Fact – opinion – sentiment – invitation – resonance – sequence

Complex (dialectical) Argumentation
- Analogy – contrast – contiguity

Rebutting of the Argument

The speaker criticizes the opponent's reasoning, type of argumentation, thesis, arguments or conclusion.

When do we refute the opponents' arguments?
- Refuting goes together with argumentation

- Refuting goes before argumentation

- Refuting goes after argumentation

- Refuting may be inserted in every argumentative part

- Refuting may initiate the opponents' speech.

When is it necessary to oppose?
- Presenting informative speech;

- Presenting a scientific report;

- When the audience support the opponent's position.

Ways of Refuting
- Foreseeing the opponent' arguments

- Pretending to Support the Opponent's Arguments

- Configuration of the Opponent's Arguments

- Accepting the opponent's Arguments

- Rejecting the opponent's ideas

- Argument Direction Change

- Comparison

2. Evaluation of arguments and critical thinking

Critical thinking means weighing up the arguments and evidence and *against* particular topic or issue. Deeply understood, critical thinking provides a rich set of concept that enables us to think our way through any problem or issue. Critical thinking is essential for:

- skilled reading, writing, speaking and listening;

- skilled reasoning within all subject areas;

- skilled decision-making and problem solving;

- skilled analysis and evaluation of one's emotions and values;

- intelligent choices in human relations;

- skilled civic and personal choices.

Critical thinking entails examination of those structures or elements of thought implicit in all reasoning: purpose, problem, assumptions, concepts, empirical grounding, reasoning leading to conclusions, implications and consequences, objections from alternative viewpoints, and frame of reference.

Table 1: Skills for Critical Thinking[2]

Assessing Claims and Arguments	Claims Value judgments Ambiguous claims Semantic ambiguity Syntactic ambiguity Grouping ambiguity Fallacies of composition and division Subjectivism Misleading comparisons
2. Credibility: Evaluating Evidence	Source of claim Claim content Credibility of news media Advertising Statistical generalization Sample size Random sample Controlled studies Replication of study

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[2] (Adapted from Moore & Parker, 2007).

	Statistical significance
3. Identify Rhetorical Ploys or Emotive Barriers to Critical Thinking	Euphemism Dysphemism Stereotypes Innuendo Loaded questions Proof surrogates Fallacies: impediments to logical reasoning. Scare tactics Rationalizing Subjectivism Relativism Two wrongs make a right Red herring Ad Hominem Genetic Fallacy Straw Man False Dilemma Slippery Slope Misplacing the Burden of Proof Begging the question

4. Features of Arguments: identifying features of different forms of argumentation and developing coherent arguments	• Premises
	• Conclusions
	• Unstated premises (*enthymemes*)
	• Unstated conclusions
	• Deductive logic
	   o Categorical claims (Venn Diagrams)
	   o Conversion
	   o Obversion
	   o Contraposition
	   o Claims variables
	   o Truth tables
	   o Deductions
	• Inductive logic
	   o Inductive generalizations
	   o Formal and informal inductive arguments
	   o Random variation
	   o Sample size
	• Casual Arguments
	   o Relevant-difference reasoning
	   o Common-thread reasoning
	   o Appeal to anecdotal evidence
	   o Doubtful causal claims/hypothesis
	   o Causal explanations and arguments

5. Moral, Legal, and Aesthetic Reasoning	• Moral value judgments • Relativism • Utilitarianism • Duty theory • Divine command theory • Virtue ethics • Justifying laws and interpreting laws • Precedent • Aesthetic value

Critical reading is the first step for rhetorical analysis. Reading critically does not simply mean being moved, affected, informed, influenced, and persuaded by a piece of writing; it's much more than that. It refers to analyzing and understanding **how** the writing has achieved its effect. In order to make a reasonable and logical analysis, students need to:

apply critical reading skills to a text that s/he is about to analyze;

- break the whole text down into several parts;

- try to determine what the writer is attempting to achieve and identify the writing strategies s/he is using;

- use these findings to determine whether the argument is effective or not;

- suggested questions that may be useful for reading:

  o *What is the subject?* Does the subject bring up any personal associations? Is it a controversial one?
  o *What is the thesis (the overall main point)?* How does the thesis interpret the subject? If asked, could you summarize the main idea?
  o *Who is the intended audience?* What values and/or beliefs do they hold that the writer could appeal to?
  o *What is the tone of the text?* What is your reaction to the text, emotional or rational (think of pathos)? Does this reaction change at all throughout the text?
  o *What is the writer's purpose?* To explain? Inform? Anger? Persuade? Amuse? Motivate? Sadden? Ridicule? Attack? Defend? Is there more than one purpose? Does the purpose shift at all throughout the text?
  o *What methods does the writer use to develop his/her ideas?* Narration? Description? Definition? Comparison? Analogy? Cause and Effect? Example? Why does the writer use these methods? Do these methods help in his/her development of ideas?
  o *What pattern does the author use for the arrangement of ideas?* Particular to general, broad to specific, spatial, chronological, alternating, or block? Does the format enhance or detract from the content? Does it help the piece along or distract from it?
  o *Does the writer use adequate transitions to make the text unified and coherent?* Do you think the transitions work well? In what ways do they work well?
  o *Are there any patterns in the sentence structure that make the writer's purpose clear to you?* What are these patterns like if there are some? Does the writer use any fragments or run-ons?
  o *Is there any dialog and/or quotations used in the text?* To what effect? For what purpose is this dialog or quotations used?

- o *In what way does the writer use diction?* Is the language emotionally evocative? Does the language change throughout the piece? How does the language contribute to the writer's aim?
- o *Is there anything unusual in the writer's use of punctuation?* What punctuation or other techniques of emphasis (italics, capitals, underlining, ellipses, parentheses) does the writer use? Is punctuation over- or under-used? Which marks does the writer use where, and to what effect?
- o *Are there any repetitions of important terms throughout the text?* Are these repetitions effective, or do they detract from the text?
- o *Does the writer present any particularly vivid images that stand out?* What is the effect of these images on the writer's purpose?
- o *Are there any tropes--similes, metaphors, personification, hyperbole, comparisons, contrasts, etc. that are employed by the writer?* When does he/she use them? For what reason(s)? Are those devices used to convey or enhance meaning?
- o *Are there any other devices such as humor, wordplay, irony, sarcasm, understatement, or parody that are used in the text?'* Is the effect comic relief? Pleasure? Hysteria? Ridicule?
- o *Is there any information about the background of the writer?* Is the writer an acceptable authority on the subject? How do you know?

Recent interest in argument visualization (particularly computer-supported argument visualization) has shown that the use of software programmes specifically designed to help students construct argument diagrams can significantly improve students' critical thinking abilities over the course of a semester-long college-level course (Kirschner, et al. 2003; Twardy, 2004; van Gelder, 2001, 2003); learning how to construct argument diagrams significantly raises a student's ability to analyze, comprehend, and evaluate arguments.

3. Argumentative skills

Competence may be understood as the expression of human acquired qualification or ability to perform qualified action under the influence of acquired skills, values and attitudes.

Leshowitz, DiCerbo & Syminton (1999) distinguished between three different levels of argumentation skills, which differ according to the extent of learning and thinking activity:

- "pseudo-knowledge",

- "destabilized knowledge", and

- "reasoned knowledge".

"Pseudo-knowledge" is created, when arguments are integrated within a knowledge base without any questioning. "Destabilized knowledge" occurs, when there is insecurity about the quality of arguments and when criteria for evaluating arguments are examined. "Reasoned knowledge" is produced, when knowledge is based on well-founded and self-developed arguments.

According to S. L. Kline (1998), four argumentation competencies are associated with critical discussions of proposals: creating consensus about problematic situations, advocating proposals, facilitating behavioral commitment, and integrating identities. This approach supports one of the theoretic attitudes towards the didactics of argumentation, which lays a special stress on interaction and collaborative knowledge construction (Baker, 2003, cited in Nauckunaite, 2007) As predicted, this relationship occurred with the argument competencies of problem conception, proposal advocacy and facilitating commitment. S. L. Kline (1998) found that discussions in which students are given the opportunity to influence, and be influenced by, arguments may provide the best context for them to develop argumentative skills. The following tasks may be useful:

- Description in some detail of a service providing semantic annotation of argumentation in student essays;

- Visualization of argumentation and provision of useful feedback to students;

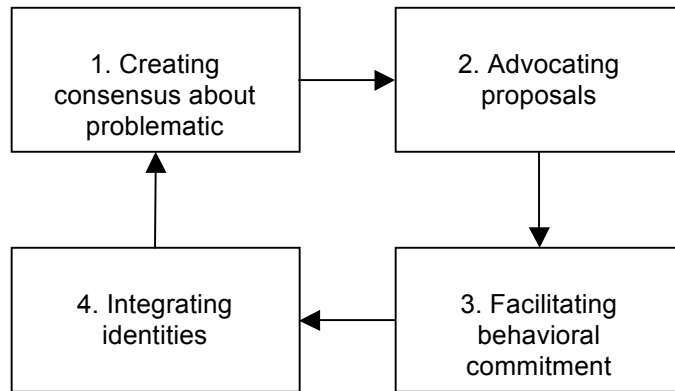- Extraction of arguments from a particular type of document.

An effective argument centres on a clear thesis. The main body of an argument, however long or divided, should be continually moving towards proving the thesis in the

reader's mind. The competence level of argumentation is analyzed on a **micro**-
(Toulmin, 1958; Toulmin, Rieke, & Janik, 1984) and **macrostructure**:

- an individual argument consists of a statement which can be supported by a warrant
  and/or specified by a quantifier (*microstructure*) (Toulmin, 1958; Toulmin, Rieke, &
  Janik, 1984). The warrant contains a justification for the statement. The quantifier
  limits the validity of the statement and can be represented optionally and sometimes
  implicitly in the structure of an argument, e.g. indicated by the word "perhaps". As an
  indicator for high argumentative competence with respect to the microstructure we
  regard the frequent use of warrants and quantifiers in an argument.

- The *macrostructure* is directed toward the argumentation sequence examining how
  discussion participants in discourse, create an argumentation pattern together. The
  analysis typically focuses on the rhetorical function of individual expressions in a
  sequence of contributions. Central concepts are argument, counterargument and
  reply/integration (e.g., Leitão, 2000). As an indicator for high argumentative
  competence with respect to the macrostructure H. Astleitner (2003) regards the well-
  adjusted use of arguments and counterarguments and moreover the formulation of
  integrations of several arguments.

4. A model of argumentative competence

Argumentative competencies may be revealed with the help of the following figure (figure 1):

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┌─────────────────────┐        ┌─────────────────────┐
│   1. Creating       │ ─────► │   2. Advocating     │
│   consensus about   │        │   proposals         │
│   problematic       │        │                     │
└─────────────────────┘        └─────────────────────┘
           ▲                               │
           │                               ▼
┌─────────────────────┐        ┌─────────────────────┐
│   4. Integrating    │ ◄───── │   3. Facilitating   │
│   identities        │        │   behavioral        │
│                     │        │   commitment        │
└─────────────────────┘        └─────────────────────┘
```

5. The development of argumentative competence in science teaching

Argumentation skills are know to be important for learning success in subject areas, like history, religion, philosophy, language education, etc. (Kemp & Sadoski, 1991). In science, research-based and experimental methods and their critical analysis were related to argumentation skills (Cleland Donnelly, Helion, & Fry, 1999).

Models of argumentative practices in science teaching: relevant reasoning, debates, disputes, and other methods

The **successful instructional methods** to support argumentation are (Bonk and Smith, 1998):

a) group activities with ranking procedures (of ideas, etc.),

b) pro-and-cons-listings (e.g., advantages and disadvantages),

c) knowledge-wishes-learn-questions (e.g., what knowledge is available? what knowledge is desired? what was learned?),

d) summing up (e.g., the core argument of a text),

e) working sheets for stimulating thinking (e.g., writing a thinking protocol),

f) debates (e.g., discussions of controversial issues), g) problem-based learning (e.g., comparison of single cases),

g) graphic organizer (e.g., using mapping techniques), and

h) other methods like, for example, contrast matrices.

The **use of dialogue** to promote argumentation development has long been explored by theorists (Bakhtin, 1981, Mead, 1962, Vygotsky, 1962).

The challenging and provoking questions by teachers and other learners are important for acquiring argumentation skills (Hittner, 1999). Reed (2001) listed such questions, based on Paul (1993):

a) What is the issue? Is the issue presented fairly?

b) From which perspective are the arguments presented? Are there alternative perspectives?

c) What assumptions do build the background of argumentation? Are they justified? What alternative assumptions can be formulated in addition

d) Which concepts are used within the arguments? Is the meaning of the used concepts clear? Are they suitable for the issue and the arguments? What effects appear when using especially these concepts?

e) Which reasons for the arguments can be stated?

f) Which conclusions are drawn? Are the conclusions supported by the arguments?

g) What are the effects of these conclusions?

i) How can the given conclusions be evaluated in relation to alternative perspectives? Are there objections in respect to the given conclusions?

Students do improve substantially their critical thinking skills if they are taught how to construct **argument diagrams** to aid in the understanding and evaluation of arguments (Harrell, 2005).

An argument map is a two-dimensional representation of argument structure. It is usually a box-and-arrows diagram which resembles a tree. (In fact, it has to be slightly more complex than a tree or it would conflate separate arguments with helping premises.) The boxes are claims, which are arranged so that some are reasons for believing (or disbelieving) others. At one extreme is the final conclusion, supported (and opposed) by its reasons and objections. At the other extreme are the unsupported claims you take as basic. For example, to map the explicit part of the argument, "Socrates is mortal because Socrates is human," we would draw:
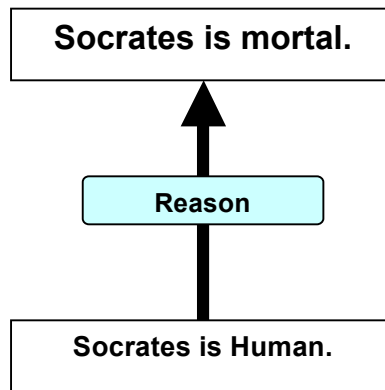
(Twardy, 2004)

Of course, this argument is not valid as it stands: there is a missing (or enthymematic) premise, "All humans are mortal." By convention, when mapping someone else's argument, we put brackets around any claims we have had to supply. So the argument map becomes:
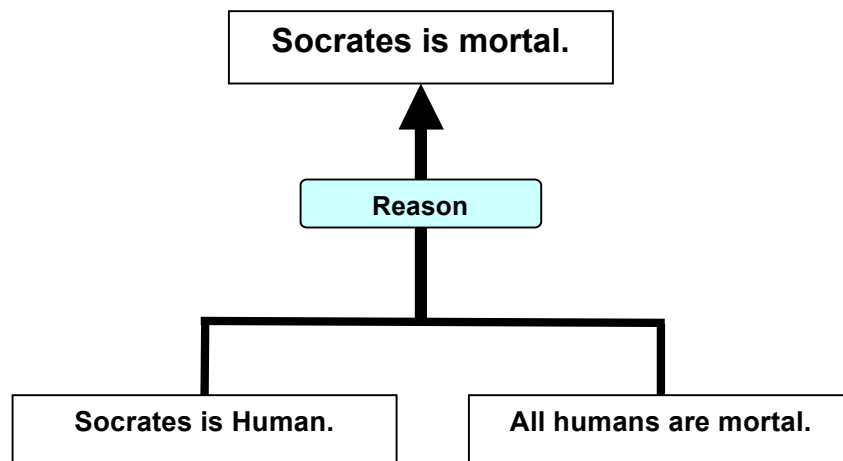
A reason is a collection of claims which help each other, rather than a single claim. For example, in the argument map above, we argue that "Socrates is mortal" with the two claims "All humans are mortal" and "Socrates is human". But those two claims together are one reason. One claim helps the other, and together they yield the conclusion.

Klein, Olson, and Stanovich (1997) showed 11-years-old students in five hours, how they can display arguments graphically and how they can mark conclusions and reasons within texts. In addition, students were shown strategies for planning and observation when analyzing arguments (e.g., questions like: how conclusive are the given arguments?). Learners were demonstrated arguments based on examples. Then students had to discuss and state conclusive and not conclusive reasons for

conclusions. This programme showed positive results in the skill of analyzing arguments (e.g., when identifying invalid arguments) and of writing reports about argumentation.

Smart question answering is the technique of providing precise answers to a specific question. For instance, given a question such as "Which country had the highest inflation rate in 2002?"

From a pedagogical perspective, semantic portals are an "enabling technology" allowing students to determine the learning agenda and be in control of their own learning. In particular, they allow students to perform semantic querying for learning materials (linked to shared ontologies) and construct their own courses, based on their own preferences, needs and prior knowledge. By allowing direct access to knowledge in whatever sequence students require them, *just-in-time learning* (Stojanovich, 2001b) occurs.

Appendix

Exercises for argumentative practice[3]

Appendix A

A. Identify the conclusion (thesis) in the following arguments. Restate the conclusion in the space provided below.

1. Campaign reform is needed because many contributions to political campaigns are morally equivalent to bribes.
Conclusion:

2. In order for something to move, it must go from a place where it is to a place where it is not. However, since a thing is always where it is and is never where it is not, motion must not be possible.
Conclusion:

B. Consider the arguments on the following pages. For each argument:
(a) Identify the conclusion (thesis) of the argument.
(b) Identify the premises (reasons) given to support the conclusion. Restate the premises in the space provided below.
(c) Indicate how the premises are related. In particular, indicate whether they
      (A) are each separate reasons to believe the conclusion,
      (B) must be combined in order to provide support for the conclusion, or
      (C) are related in a chain, with one premise being a reason to believe
      another.
(d) If you are able, provide a visual, graphical, schematic, or outlined representation of the argument.
(e) State whether it is a good argument, and explain why it is either good or bad. If it is a bad argument, state what needs to be changed to make it good.

3. America must reform its sagging educational system, assuming that Americans are unwilling to become a second rate force in the world economy. But I hope and trust that Americans are unwilling to accept second-rate status in the international economic scene. Accordingly, America must reform its sagging educational system.
(a) Conclusion:
(b) Premises:
(c) Relationship of the premises. Circle one: (A) (B) (C)
(d) Visual, graphical, schematic, or outlined representation of the argument:
(e) Good or bad argument? Why?

4. The dinosaurs could not have been cold-blooded reptiles. For, unlike modern reptiles and more like warm-blooded birds and mammals, some dinosaurs roamed the continental interiors in large migratory herds. In addition, the large carnivorous dinosaurs would have been too active and mobile had they been cold-blooded reptiles. As is indicated by the estimated predator-to-prey ratios, they also would have consumed too much for their body weight had they been cold-blooded animals.
(a) Conclusion:

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[3] adapted from Harrell (2005)

(b) Premises:
(c) Relationship of the premises. Circle one: (A) (B) (C)
(d) Visual, graphical, schematic, or outlined representation of the argument:
(e) Good or bad argument? Why?

5. Either Boris drowned in the lake or he drowned in the ocean. But Boris has saltwater in his lungs, and if he has saltwater in his lungs, then he did not drown in the lake. So, Boris did not drown in the lake; he drowned in the ocean.
(a) Conclusion:
(b) Premises:
(c) Relationship of the premises. Circle one: (A) (B) (C)
(d) Visual, graphical, schematic, or outlined representation of the argument:
(e) Good or bad argument? Why?

6. Despite the fact that contraception is regarded as a blessing by most Americans, using contraceptives is immoral. For whatever is unnatural is immoral since God created and controls nature. And contraception is unnatural because it interferes with nature.
(a) Conclusion:
(b) Premises:
(c) Relationship of the premises. Circle one: (A) (B) (C)
(d) Visual, graphical, schematic, or outlined representation of the argument:
(e) Good or bad argument? Why?

Appendix B

A. Identify the conclusion (thesis) in the following arguments. Restate the conclusion in the space provided below.

1. In spite of the fact that electrons are physical entities, they cannot be seen. For electrons are too small to deflect photons (light particles).
Conclusion:

2. Since major historical events cannot be repeated, historians are not scientists.]After all, the scientific method necessarily involves events (called "experiments") that can be repeated.
Conclusion:

B. Consider the arguments on the following pages. For each argument:
(a) Identify the conclusion (thesis) of the argument.
(b) Identify the premises (reasons) given to support the conclusion. Restate the premises in the space provided below.
(c) Indicate how the premises are related. In particular, indicate whether they
      (A) are each separate reasons to believe the conclusion,
      (B) must be combined in order to provide support for the conclusion, or
      (C) are related in a chain, with one premise being a reason to believe
      another.
(d) Provide a visual, graphical, schematic, or outlined representation of the argument (for example, an argument diagram).
(e) State whether it is a good argument, and explain why it is either good or bad. If it is a bad argument, state what needs to be changed to make it good.

3. If species were natural kinds, then the binomials and other expressions that are used to refer to particular species could be eliminated in favor of predicates. However, the binomials and other expressions that are used to refer to particular species cannot be eliminated in favor of predicates.
It follows that species are not natural kinds.
(a) Conclusion:
(b) Premises:
(c) Relationship of the premises. Circle one: (A) (B) (C)
(d) Visual, graphical, schematic, or outlined representation of the argument:
(e) Good or bad argument? Why?

4. Although Americans like to think they have interfered with other countries only to defend the downtrodden and helpless, there are undeniably aggressive episodes in American history. For example, the United States took Texas from Mexico by force. The United States seized Hawaii, Puerto Rico, and Guam. And in the first third of the 20th century, the United States intervened militarily in all of the following countries without being invited to do so: Cuba, Nicaragua, Guatemala, the Dominican Republic, Haiti, and Honduras.
(a) Conclusion:
(b) Premises:
(c) Relationship of the premises. Circle one: (A) (B) (C)
(d) Visual, graphical, schematic, or outlined representation of the argument:
(e) Good or bad argument? Why?

5. Either humans evolved from matter or humans have souls. Humans did evolve from matter, so humans do not have souls. But there is life after death only if humans have souls. Therefore, there is no life after death.
(a) Conclusion:
(b) Premises:
(c) Relationship of the premises. Circle one: (A) (B) (C)
(d) Visual, graphical, schematic, or outlined representation of the argument:
(e) Good or bad argument? Why?

6. Of course, of all the various kinds of artists, the fiction writer is most deviled by the public. Painters, and musicians are protected somewhat since they don't deal with what everyone knows about, but the fiction writer writes about life, and so anyone living considers himself an authority on it.
(a) Conclusion:
(b) Premises:
(c) Relationship of the premises. Circle one: (A) (B) (C)
(d) Visual, graphical, schematic, or outlined representation of the argument:
(e) Good or bad argument? Why?

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Outline of Argumentative competence training sequence
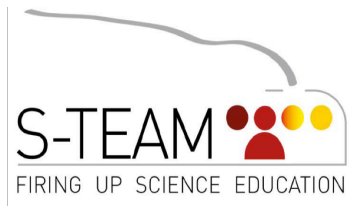
KAIP MOKYTI ARGUMENTUOTI?
Argumentative competence: how to develop it?

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The following is an outline of the powerpoint presentation which is used with student teachers at KTU and elsewhere. It is intended to be used as the basis for a short introductory course on argumentation or rhetoric. The full version can be downloaded from the link below:

http://distance.ktu.lt/vips/index.php?svc=page&sp[]=RecFrameSet&pageback=CourseDescription&backid=619&courseid=619&id=6182

1. **Title slide: Argumentative competence: How to develop it?**

2. **Objectives:**

   a. To analyze the concepts of 'argument', 'argumentation';

   b. To clarify the types of arguments and argumentation;

   c. To define personal argumentative skills while referring to the preliminary rubric for argumentation skills.

3. **Relevance of Argumentative competence**

   a. Has a direct influence on a person's successful career path, enables him/her to work effectively, communicate reasonably and to lead an intellectually active life;

   b. Majority of students lack argumentation skills and experience frustration while defending their opinion in public;

   c. A person should learn how to perform argumentative reasoning (to debate, to participate in a dispute, to negotiate, etc...).

4. **What is an argument?**

   a. Argument is a fact or statement put forth as proof or evidence;

   b. A reason;

   c. A set of statements in which one follows logically as a conclusion from the others.

5. **Classical Types of Arguments**

   a. **Logos** (logical: e.g. deductive, inductive arguments)

   b. **Ethos** (e.g. ethical decisions)

   c. **Pathos** (e.g. emotional impact)

6. **Types of Arguments**

   a. Rational

   b. Emotional

   c. Factual

7. **Structure of an Argument**

    a. **Premises + reasoning → the conclusion**

    b. *For e.g.:*

    c. *X is a book.*

    d. *All books have pages in them.*

    e. *Therefore, X has pages in it.*

8. **Argument Structure: Premises**

    a. The starting points of an argument.

    b. They are assertions we must assume to be true in order for the argument to get off the ground.

    c. Any statements that we have to make which are not themselves proven at the moment.

    d. Premises may be incontrovertible pieces of knowledge; or they may be hypotheses that we make 'for the sake of argument...'

9. **Inference**

    a. The transition or movement from premises to conclusion, the logical connection between them, is the inference upon which the argument relies.

10. **Conclusion**

    a. The *conclusion* is whatever proposition of the argument is attempting to prove. The conclusion may then be used as a premise in a later argument.

11. **Concept of argumentation**

    a. The process of developing or presenting an argument.

    b. Argumentation is the study of how humans can, do, and should reach conclusions through logical reasoning, that is, claims based on premises.

12. **Linear Argumentation (1)**

    a. **Example**

My room area is only 12 m^2.

It is too small.

In my room, I feel uncomfortable.

    b. **Structure**: Fact – opinion – sentiment

13. Linear Argumentation (2):

    a. Proposition - Facts - Opinion - Sentiment - Offering action - Resonance

- **Proposition**: Lithuanian men and women have equal rights, as guaranteed by law.

- **The Fact (Objectivity)**

- Lithuania has more women than men participating in politics but only a tenth of politicians are women.

- **Opinion** (an analysis of the proposal, the rationale for subjectivity)

- This should not be the case if the country has gender equality.

- **Sentiments** (emotional subjectivity)

- In addition, we will look strange in the context of other EU countries.

- **Proposal for action** (activism, persuasion)

- Therefore, I have prepared a specific proposal, which includes measures to bring more women into politics.

- **Effect** (the resonance, the expected result)

- I hope this campaign will be successful in the next election and we will see many more nominations for women.

14. Complex (dialectical) Argumentation

- Analogy - contrast - closeness

- Analogy (shows the relationship between well-known things: It's like...)

- Contrast (to the contrary, are looking for ideas, opinions, positions: on the contrary ...)

- Closeness (straight parallelism, value: the total is...)

15. **Rebuttal of Arguments**

   a. The speaker criticizes the opponent's reasoning, type of argumentation, thesis, arguments or conclusion.

16. **Example**

- Alexsandras Vershbow, Deputy Minister of Defense for international security affairs and former U.S. ambassador to Russia, said that the problems in separatist regions can be solved by military means. A. Vershbow in Moscow denied the allegations that it seeks to rearm Georgia, stating that the Georgian Defense Ministry has not received one cent of a billion dollars of support that Washington allocated to Tbilisi.

17. **When do we Refute the Opponent's Arguments?**

   a. Refutation goes together with argumentation

   b. Refutation goes before argumentation

   c. Refutation goes after argumentation

   d. Refutation may be inserted in every argumentative part

   e. Refutation may initiate the opponent's speech...

18. **When is it necessary to oppose?**

   a. Presenting informative speech;

   b. Presenting a scientific report;

   c. When the audience support the opponent's position**.**

19. **Ways of Refuting**

- Prediction

- Supposed approval

- Argument 'tilt'

- Consent

- Rejection

- Change direction of argument

- Comparison

20. Foreseeing the opponent's arguments

- Prediction helps speakers position themselves against the opponent

- Providing all possible objections to your opponent in advance, being well prepared to cover all objections or problems

- Guessing the future audience reaction and waiting for questions, eliminating confusion, particularly negative emotions, 'as explained previously', soothing the audience.

21. Pretending to Support the Opponent's Arguments

- Orator take the opponent's argument and uses it to effectively destroy them.

- This method often relies on irony, wit, mental dexterity of the speaker

22. [Re]configuration of the Opponent's arguments

- Opponent's argument is tilted in favour of the orator.

23. Accepting the opponent's Arguments

- Consent - unconditional surrender to the opposing speaker

24. Rejecting the opponent's ideas

- Speaker rejects any idea of the opponent, saying that it is not a theme or issue in question

25. Argument Direction Change

- Opponent's weapon turned against him/herself (the boomerang way!)

26. **Comparison**

- Orator uses a comparison or analogy to undermine opponent's case

27. Expansion of the Argumentation

- Compose and consolidate argument

- Destroy opponent's arguments

- Support opponent's arguments

- Create conclusion from evidence

- Win listeners' confidence and acceptance

28. Level of Argumentative Skills (1)

- A1 - I can find the main arguments in written and spoken texts;

- A2 - I can examine written and spoken texts to find the main arguments and trace their development

29. Levels of Argumentative Skills (2)

- B1 - I can examine written and spoken text to find, evaluate and correct incorrect reasoning;

- B2 - I can examine written and spoken text to find and assess correct, incorrect and counter-arguments;

30. Levels of Argumentative Skills (3)

- C1 - I can examine and written and spoken text available to assess their fair or false arguments and present their arguments and counter-arguments;

- C2 - I can discuss the development of complex, dialectical, arguments within the text, revealing contradictions

Recommended reading;

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