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Evaluating arguments in instruction: Theoretical and practical directions

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ABSTRACT

Instructional processes support the production of learning outcomes such as valid conclusions, solutions or decisions. These processes invite the evaluation of information at hand and knowledge construction, which involve the elaboration and evaluation of arguments. This article provides a practical guide for evaluating arguments during instruction. The practical criteria for goodness of arguments in instruction include clarity, explicitness, relevance of the reasons supporting the claim, inclusion of evidence and theoretical explanations, acceptability (according to the rules and norms of the context), and sufficiency (of groundings). In addition, it must cope with competing arguments, as well as with opposing and alternative evidence and theoretical explanations. I show that evaluation of arguments involves not only critical thinking but also creative thinking.

1. The evaluation and construction of arguments as tools for justifying beliefs and constructing knowledge

Arguments are building blocks of Informal Logic (Walton, 1989). They are also central in educational psychology: The evaluation and construction of arguments are considered as high order thinking skills which learners and should develop in order to justify beliefs and knowledge (Goldman, 2003; Schwarz, Neuman, Gil, & Ilya, 2003). Many logicians elaborated criteria for the evaluation of arguments (e.g. Govier, 2000; Johnson & Blair, 1994; Means & Voss, 1996; Scriven, 1976; Slob, 2002). However, those criteria are partly not well adapted to the educational world. In this article, we review and reorganize these criteria in order to use them as practical systematic evaluation of arguments in education. As a first step, students need to identify the arguments when studying or creating texts. They have to identify the components of arguments.

2. Recognizing components of arguments

The basic structure of arguments includes a claim and a reason that supports it (e.g. Angell, 1964; Freeman, 1991; Means & Voss, 1996; Scriven, 1976). Some use the terms *conclusion* and *reason* (Angell, 1964), others use the terms *premise* and *conclusion* (Scriven, 1976). Some refer to the term *thesis* rather than *claim* (Kuhn, 1991). This diversity depends on the field at stake (e.g., philosophy, psychology, law, etc.). However, the term *claim* links arguments to argumentation by stressing its dialectical dimension: As Freeman argues, "By making a claim, as Toulmin points out, we incur an obligation to defend it if challenged.(1991, p. 49).

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2.1. Claim

A claim appears in an argument in various forms of expression such as an opinion, a point of view, a conclusion or a rule (e.g. 'this is how its work') and as an instruction for action (e.g. "you should do x"). Assertions expressed without any intention or ability to discuss them cannot be considered as claims. Assertions that involve matters of taste (e.g., "bitter chocolate is more tasty than milk chocolate"), emotion (e.g., "I love you"), fundamental beliefs (e.g., "I believe in god"), and axioms or acceptable truths (e.g., two parallel lines shall never cross each other) are examples of assertions which generally cannot be considered as claims because there is no expectation to justify them. Of course, in certain contexts, these assertions are claims. For example, "I believe in God", can be claimed in a philosophical polemic. Assertions are claims when their expression is likely to be discussed or challenged. Claims in the form of moral imperatives as the Commandments: "Thou shalt not kill" or "Thou shalt not steal" do not require evidence as condition for their justification. The theoretical explanations for such imperatives should provide sufficient justification. Leibowitz went even further and argued that a person of faith should behave by the imperative itself, without demanding further justification to fulfil it beyond it being a divine command (Leibowitz, 1982; p. 11). For a person of faith, such imperatives are fundamental truths, which cannot be argued with.

Claims in different fields or contexts require different rules of justification. Claims seeking to establish scientific or legal theories require different rules of justification from claims that are moral imperatives. We expand on this issue in the next subsection.

2.2. Reasons

Reasons supporting a claim can be categorized according to the main epistemological question "how do we know what we know?" into two major types: theoretical explanations and evidence (Brem & Rips, 2000; Glassner, Weinstock & Neuman, 2005; Kuhn, 2001). Evidence answers the question: 'how do we know that the claim is true?' and theoretical explanation answers the question: "what are the causes or motives for the claim?" (ibid). The aim of evidence is to prove the truth of a claim (usually by data), and the aim of theoretical explanations is to explain the theories (e.g. causes) which support the claim.

Scientific claims need to be grounded on both evidence and theoretical explanations. For example, the claim "there is a possibility for other forms of life beyond the planet Earth" is expected to be justified by both presenting evidence and providing theoretical explanation. Evidence is expected to be direct rather than circumstantial. A theoretical explanation of why forms of life are possible beyond the planet Earth would strengthen the claim, especially in the case when which there is no direct evidence. Scientists sometimes begin their inquiry by observations and explorations, which may lead them to create a generalization, rule or theory. Then they look for evidence to support their theory (e.g. Einstein and the relativity theory). The distinction between evidence and theoretical explanations is important. Kuhn (2001) has known that young students make confusions between the two. It is then imperious to stress this distinction in instruction.

Beyond the identification of the basic components of arguments, evaluation should account for their typology. We present here several types of arguments to be identified by students.

3. Types of arguments

The most basic distinction is to differentiate between formal and informal arguments (Means & Voss, 1996; Schwarz & Glassner, 2007; Walton, 1989). Formal arguments are deductive and should be evaluated according to rules of formal logic. In deductive arguments, inferences are drawn from accepted rules. The basic components of a formal argument are premises and a conclusion. An appropriate formal argument must be (a) valid (the premises [or early assumptions] necessarily lead to the conclusion), and (b) with truth-value (the premises should represent truth). For example, the first premise "when it rains there are clouds" (the general rule) and the second premise "there is rain now" (the particular case), necessarily lead to the conclusion that there are clouds now. As such, it is valid argument. It is also a true argument because the premises are true (evidentially). Logic or in mathematics classes are the right frameworks for such an evaluation, which involves deductive proofs. Language studies offer proper contexts for such formal arguments in the form of grammar rules. The elaboration of formal arguments is highly constrained, but teachers may invite students to be creative in the very production of formal arguments. For example, the teacher may invite students to find alternative ways to find the true solution. In addition, students may combine formal and informal reasoning while evaluating the alternatives: they may ask "what will be the most effective way, the shortest way, or the most elegant way to prove a theorem".

Informal arguments are involved in academic, public and daily discourse. The inference can be inductive (from particular cases to a general rule/theory or from observations or sample to general findings and conclusions), analogical (from one case to a similar one) or conductive (Wellman, 1971). Sometimes, in our daily discourse, we express *enthymemes* which have the structure of deductive arguments but with one unexpressed or implicit premises (Goldman, 2003), and therefore are considered to be informal arguments.

Arguments can also be distinguished according to other aspects using several different categories. For example, one might categorize arguments according to their goals: to discover truth, to choose between alternatives in the process of decision making, to persuade the public to accept a standpoint (Glassner, Weinstock & Neuman, 2005; Walton, 1989). Different types of inference used in different learning situations or subjects for different goals require different types of justification.