ArguQuest – an online platform to support the development of arguing and questioning skills

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Abstract

Argumentation and Questioning are two of the most important competences that students must acquire in order to become more pro-active as far as reasoning and critical thinking are concerned. This belief is shared by a considerable number of researchers and some studies, like the ones developed between 2008 and 2010 in the Netherlands at Utrecht University, in Singapore at Nanyang Technological University, and in England at the school of Education of Kings College, are a few good examples. The literature offers results on the promotion of environments and learning communities that encourage reasoning by confronting students with arguing and questioning activities, very similar to higher order thinking skills, but essential as basic literacy skills. The present paper is the result of the meta-analysis of two PhD studies, one on online argumentation and the other on questioning, both in higher education. Crossing the results of both studies lead to the idea of an online project – ArguQuest –, whose main objective is to develop an open and multilingual platform to promote the acquisition and improvement of these competences. The platform is based on a model of interaction that encourages and supports questions and arguments about a given subject in such a way that both competences interact and foster personal positions, justifications in dyads and the clarification of arguments for the purpose of promoting high level reflexions and subsequently enrich students’ knowledge construction and conceptualisation.

Keywords: Skills, Argumentation, Questioning, eLearning platforms

Theoretical framework

Among the fundamental learning literacies and skills that students must possess, there are key competences that encourage the development of reasoning and critical thinking such as questioning and argumentation. The latest investigations in this area demonstrate the need for students to acquire these skills, so they can be involved in learning-based capabilities such as predicting, hypothesizing, challenging the perspectives of others and changing their own points of view when appropriate. In several recent studies, namely the one by Chin & Osborne (2010), argumentation is considered a verbal, social, and rational activity employed to convince someone about the acceptability of a perspective by proposing statements and evidences that justify or refute a previously expressed idea. This competence is, therefore, central to the process of thinking. The authors who studied the importance of questioning also see the process of question-generation and, in particular, the design and use of quality questions as important training in the development of critical thinking skills.
“Questioning is one of the thinking processing skills which is structurally embedded in the thinking operations of critical thinking, creative thinking and problem solving. It consists of the smaller micro-thinking skills of recall, comprehension, application analysis, synthesis and evaluation […] Questions guide knowledge construction in the formation and changing of the cognitive networks or schemata” (Cuccio-Schirripa & Steiner, 2000, p. 21).

On the other hand, the literature considers questioning as a complementary process that supports argumentation by helping to stimulate cognitive disagreement (Chin & Osborne, 2010).

The present study aims to explain the development of an online and multilingual platform that brings together these two competences so that they both promote and support each other.

As Chin & Osborne (2010) argue, we believe that these competences are extremely connected. By questioning oneself or a peer about a dissonant viewpoint, questions and answers will be provided in terms of justification, concession or refutation statements that become new arguments. Those statements will generate deeper questions and there will be continual and recurrent movements and questioning/arguing episodes that will promote reasoning and critical thinking.

The platform ArguQuest

Argumentation and questioning competences are inseparable. “Used jointly, argumentation and questioning have the potential to promote critical thinking and to foster reflection, deep thinking, and the construction of conceptual knowledge” (Chin & Osborne, 2010, p. 141).

To our knowledge, the interaction between these two competences – argumentation and questioning – has so far not been studied, nor has it been empirically explored in eLearning contexts as far as this research has established. We also have to consider that the existing platforms for the development of argumentation skills do not address the issue of questioning, although we recognise that in some cases there is such an implicit concern.

The development of the platform ArguQuest has the intent to promote active learning and critical thinking in a collaborative and distributed environment. As mentioned above, although there is some software that deals with argumentation competences, none of them stimulates arguing and questioning together in such an environment as the Internet can offer.

The elaboration of ArguQuest follows the international trends of Web 2.0 or Social Web because it is a software that might be used by teachers and their students or researchers and other participants in collaboration with actors who work synchronously or asynchronously or even individually on any computer with web access.

The main intention of this project is to produce knowledge about the relationships between questioning and argumentation by means of its theoretical foundations and by establishing a platform organised in modules focussed on the development of strategies in order to allow to
identify the influence and implications of the platform i) on learning contexts; ii) on educational practices, and iii) in the promotion of learners' critical thinking.

Ultimately, ArguQuest aims at becoming a distributed tool for the promotion of argumenting and questioning competences and, simultaneously, serve the purposes of competence development assessment and the comprehension of how they are constructed and developed, by means of log-records and argumentative movements depicted on argumentation and questioning maps.

The organisation of ArguQuest

Several authors refer the advantage of the use of guidelines, named indistinctly as "sentence openers", "scripts" or "prompts", regarding both the construction of simple arguments and the elaboration of argumentative sequences. Those guidelines can interfere interactively, suggesting the subsequent exchange and also acting as self-regulating learning mechanisms and peer feedback facilitators (Kanselaar, Erkens, Prangsma, & Jaspers, 2003; Weinberger, Fischer, & Stegmann, 2005).

In the same way and considering the results described in the literature, in ArguQuest the students will always have the possibility to access a set of scripts that offer them support and guidance in formulating questions and help them deepen their reasoning by drawing up several requests for information as questions of confirmation, justification, deduction, supposition, speculation, prediction, analysis and explanation, among others (Loureiro & Neri de Souza, 2009).

The structuring of these questions is not intended to be closed or to limit the elaboration of students' questions. The model offers generic and specific questions but students have to make their own: they are open questions and can (are expected to) be expanded. Connectors (this, that, so, then...) should be replaced according to the students' understandings.

The platform also aims, on the one hand, to promote learning through cross-questioning and argument interaction and, on the other hand, that students deepen their thinking to become experienced and explicit to their interlocutor when they have to resolve cognitive conflicts.

Accordingly, the platform will be organised into four different modules, from elementary questions to high level questions and argumentative maps that result from the interaction between students and i) their peers; ii) the platform tools; iii) the representations and contents and iv) the tutor (Neri de Souza & Loureiro, 2008).

In the first module students are invited to make questions about the material proposed by the teacher. Those questions might reflect all the doubts, certainties and incongruence the material/problem question, suggest. It is the brainstorming stage.

The second module is the one where the students will begin the interaction with their peers and eventually with the class in order to arrive to more significant questions. They have to decide
what questions are trivial and do not bring much to the discussion and which ones are really substantial to the subject they are studying.

“In the process of negotiation and coming to some shared understanding, students make argumentative moves such as challenges, counter-challenges, refutations, justifications and concessions. [...] Encouraging students to ask questions about the phenomenon under discussion, and of one another, might potentially stimulate more extended and elaborated arguments” (Chin & Osborne, 2010, p. 231).

Considering this evidence, in the third module each student will play in turns the role of questioning and answering, taking into account the questions and first arguments they drew in the previous module. In this module students will also be provided with models of answers to help them deepen their judgment and beliefs and to resolve the conflict they encounter in this more profound discussion where they are supposed to think and rethink, to write and rewrite their questions and answers. They are expected to produce complex interactions that reflect all agreement or disagreement. In this module, the prompts and the intervention of the tutor are fundamental to further and support questioning strategies brought about by the dyad to overcome and resolve the dissonances and obstacles to peer agreement. Furthermore, in this module, and as proposed by Chin & Osborne (2010), it is expected that the students’ questions will have an important role, becoming the engine and the support to the argumentation.

In the fourth module, the last one, the students have to offer reasons, arguments for, reflective questions, rebuttals and new reasons to reinforce ideas. They have to deepen their reasoning to
a certain level, according to the subject they are addressing, their level of schooling and knowledge. After having reflected on the subject, the students are now aware and in possession of a more detailed and solid knowledge, so they are invited to draw an argumentative map in which they will expose the subject schematically in order to be convincing about the knowledge they acquired.

Argumentative maps are characterized by a schematic organization in which a first premise gives rise to three (four, five...) other issues or assumptions that correspond to arguments or counter-arguments subdivided into other refinement levels, until the subject is considered thoroughly explained and discussed.

An example of an argumentative map about GMOs (genetically modified organisms) presents a sequence of favourable (+) and unfavourable (-) arguments, as well as the respective counter-arguments (-) or reinforcements (+) of the first reasons given in fig 2 (Loureiro, 2007).

![Figure 2 Argumentation map about transgenic organisms (students’ questions in bold).](attachment:image.png)
This map shows how students use questioning to enhance and reinforce their arguments. In this particular case, a study on the development of argumentative competences online, the students had previously discussed GMOs in dyads, and then they were asked to prepare individual argumentative maps resulting from their confrontation of ideas.

It is interesting to verify that, even without having been instructed to do so, they used questioning in their maps. Questioning helped them to better structure their arguments. Episodes like this show that arguments and questioning are, in fact, inseparable and, moreover, learning to argue with the support of questioning and vice versa helps increase the awareness and the development of both competences.

To question ideas and/or statements with which students are confronted is the desirable process that will lead them to the attentive task of pondering that will help them become aware and comprehend the weaknesses or the strengths of their representations or beliefs about the topic under study. It is in this process of i) recognition of inconsistencies or flaws in reasoning; ii) formulation of hypotheses; iii) evaluation of evidence that supports or refutes hypotheses; and iv) formulation of valid alternative explanations, that students reinforce their capacity to negotiate and argument. This also fosters the emergence of new cycles of questions that in turn lead to other arguments and negotiations, until students feel they have solved the problem and overcome the stage of cognitive conflict they were in at the outset.

Implications and final considerations

Considering that the teacher (tutor) should always be present online and intervene whenever necessary or whenever requested by the students, the ArguQuest platform requires a change in the attitude and roles of the teacher. Some of the problems posed in the literature for student-centred teaching are: i) the loss of control over the class; ii) the superficiality of topics for discussion and iii) the reduced objectivity in assessment.

ArguQuest is being designed in the belief that it will be able to offer greater control of interactions and a sound technological support, augment the depth of discussion of topics by means of “surgical” intervention of the teacher and of the processes of argumentation and questioning themselves. We also hope that the questions and arguments database, the interaction logs and the argumentation and questioning maps become tools that facilitate and promote the systematic and accurate assessment of students in this area.

References


