WHY RACK YOUR BRAINS WITH EPISTEMOLOGY?*

THE ADVANTAGES OF EPISTEMOLOGICAL REFLECTION FOR EDUCATION

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To answer the question asked in the title of this article, first of all, I would say that engaging in epistemological reflection is necessary as it is both essential and interesting to do so, because it is not as complicated as we might think, because it clearly influences our practice, and because once we start, we just want to go on!

Epistemology is involved wherever there are grounds for reflection —i.e., when observing a phenomenon, criticizing an idea, summarizing a text, selecting references, structuring information, choosing a method, representing a phenomenon using an equation, analyzing data by means of a conceptual framework, proving a hypothesis, distinguishing between two subject areas, studying economics, working in physiotherapy, and so on. Engaging in epistemological considerations thus means exploring our own relationships, not only with scientific or scholarly knowledge, but with the knowledge-acquisition and skills-development processes, and therefore with learning. By means of this type of critical exploration, we undertake not to systematically and obediently subscribe to scientific and subject-specific knowledge, opting instead to consider how the logic of this knowledge is produced while keeping in mind the ethical and practical issues concerned. Epistemological reflection usually involves distinguishing between several schools of thought and recognizing their differences. It actually allows experts in a given discipline to determine where they stand vis-à-vis these trends (Do, 2003).

However, Gérard Fourez warns us that "epistemology is not a gratuitous exercise: knowledge of it has concrete effects on the way in which we teach" (2003, p. 12) [translation]. And that is precisely why I believe it is important that, as pedagogues, we agree to engage in reflections of an epistemological nature.

In this article, I will attempt to present a few elements that will help us identify our epistemological stance from a disciplinary and pedagogical angle.[1] At the same time, I will highlight the impact it may have on teaching practice.

DO YOU KNOW YOUR EPISTEMOLOGICAL STANCE?

An individual's epistemological stance cuts across several perspectives that are all related to relationships with knowledge—yes, relationships in the plural. These may be areas of academic (or scientific or disciplinary) knowledge, constituted through scientific research and collective reflection and that are found in laboratories, universities, colleges, books, periodicals, blogs, documentaries, websites and in the heads of experts. Such areas of knowledge may also be associated what we have learned, or acquired, with what everyone has integrated over the course of their studies or personal and professional experience and which are accessible, in every individual mind.

Exploring our epistemological stance means taking a look at the status and the value of the knowledge in our fields, as well as the method that enables us to access them. To do so, we can ask four general questions (inspired by Le Moigne, 1995, p. 4):

- What is knowledge?
- Where does it originate or how is it specifically created, in a given discipline?
- How can its value or validity be assessed?
- How do we, as human beings, become aware of it? In other words, how do we learn? How do we integrate scholarly knowledge so that we can master and use it?

Asking such questions allows us all to gain a better understanding of what epistemology actually is.

Some authors take a rather traditional approach to this concept. In the main, they describe epistemology as the *philosophy of science*. In their eyes, epistemology makes it possible to answer the question "How do we know what we know?" Furthermore, they link this question to concepts of community and scholarly knowledge. Others tend to associate epistemology more with a *theory of knowledge*.[2] In their view, such a theory makes it possible to answer the question "How do we learn what we learn?" It should also be noted that these researchers believe this question refers to the individual, one's personal process, and therefore, to knowledge that is learned and operational

* We suggest to first read the editorial of the issue 29-1, as some concepts used here are presented in this text. The Editor-in-Chief would like to thank Norm Spatz for his substantial revision of this English version of the article.

[1] It would also be possible to envisage epistemology in a psychological, historical, sociological or anthropological perspective. However, in this text, I will only discuss the disciplinary and pedagogical dimensions of epistemology.

[2] Some also tend to associate it with the psychology of learning.

(Gagnon, 2015). Moreover, the concept of epistemology has several other meanings, which we can summarize by stating that *epistemology refers to a grand narrative dealing with the processes of formulating and assimilating knowledge.*

Although they appear to be quite different, these two ways of approaching epistemology necessarily wind up intersecting, with the first group strongly influencing the second one. Now, let's take a deeper look by examining the philosophical aspect of this *grand narrative*.

THE PHILOSOPHY OF SCIENCE

From the outset, all post-secondary teachers are specialists in a given field. The way in which these teachers were presented with the concepts associated with their field in secondary school, in college and at university; the way teachers learned to master these concepts; the type of research currently conducted in their fields; the literary genre used by the community of specialists that regularly provides teachers with knowledge specific to their fields of expertise: all of this means that today, these teachers each have a particular approach to their discipline. Such an approach or vision is generally quite widespread within every teacher's scientific or disciplinary "family," and teachers undoubtedly play a role in transmitting it through their teaching, based on the schema familiar to them.

Recognizing the beliefs they hold, the various relationships between such beliefs and their discipline as well as their emotional and cognitive dimensions, enables pedagogues to have greater control over the way they teach their subjects. To define such relationships, it is important to first explore the various schools of thought that have marked epistemology over time. To mention but a few of the theories that have emerged since the Renaissance, I would refer to Descartes' rationalism, Hume's empiricism, Kant's idealism, Comte's positivism, Popper's falsificationism, Poincaré's realism, Bachelard's epistemological break, Kuhn's scientific revolutions, and social constructivism as advocated by Fourez.

To examine your epistemological convictions and preferences in connection with discipline-specific knowledge, you can consult the table published by Mathieu Gagnon in this issue of *Pédagogie collégiale (29-1)*. The table provides a succinct summary of some of the various schools of thought that can be associated with the field of epistemology.[3]

AN EPISTEMOLOGICAL POINT OF VIEW ON ONE'S DISCIPLINE

Does my discipline belong to the sciences according to which discoveries and objectivity must prevail in the formulation of knowledge? Or is it linked to disciplines in which knowledge is more closely associated with interpretation and subjectivity? The simple answer that every teacher will find to these questions will speak volumes about the way in which scholarly knowledge is constructed and validated in their domain (through the observation of facts, or the discovery of errors, or through the accumulation of experience, or through the negotiation of meaning, for example). Similarly, for pedagogues, the answer will reveal how knowledge is perceived (as universal facts, individual perceptions, standardized representations, and so forth), which, in the end, will shed light on the openness shown by people in a given domain, when *discussion* of such elements is required.

- In my discipline, what is deemed true, or scientific? How is truth distinguished from falsehood?
- Is knowledge identified and constructed (by induction, deduction, observation, experimentation, and so forth)? How is it validated (by verification or by refutation)?
- What are the current frames of reference? In light of these frameworks, can it be acknowledged that what holds true here holds true elsewhere, that what is just in the present time has always been or will always be just, in another time?[4]

Reflecting on these questions will enable teachers to take a position with respect to prevailing approaches in their fields, and with regard to the teaching of associated concepts, in terms of the many didactic choices that they need to make. It will also guide teachers in terms of pedagogical choices and provide them with the opportunity to assess the influence they have on students and student learning in the courses they give.

Indeed, whether consciously or unconsciously, we transmit our own concepts of our discipline to our students: through our

[3] Readers wishing to further explore this subject may also consult texts by Gingras (2013), Gagnon (2015), Crahay and Fagnant (2007), Charlot (1997), Hofer and Pintrich (1997) and Verhaeghe et al. (2004).

[4] I invite you to consult the final inset in this article to gain a better perspective on education in the evolving field of disciplines.

vision of knowledge, what we say, our pedagogical strategies and our feedback, we educate students about the essentials of our field. Students come to the classroom with their own ideas of the concepts they are required to learn, or with a sense of what they think they already know. Understanding the relationships that students have with the knowledge conveyed in the classroom will allow the teachers to confirm appropriate knowledge and to deconstruct erroneous knowledge, and to reinforce or adjust their approach, as required.

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A MORE RELATIVE APPROACH TO SCIENCE

Among the various schools of thought in the field of epistemology, there is one that deserves greater attention, because it calls on us to relativize our beliefs: the social constructivist concept of the process of developing scholarly knowledge and science. Gérard Fourez is one of the main proponents of this approach. This physicist and contemporary philosopher believes that researchers do not *discover* truths, but instead *invent* models that explain the world, through discussion and negotiation. Gagnon illustrates Fourez's position:

> "The scientific endeavour is [...] considered, in part, as a creative process, a process that is above all a social process […]. All models, like all maps, focus on some elements rather than others; as a result, each one has an orientation" (2015, p. 121) [translation].

Whether or not one agrees with social constructivist theory, there is one upside to Fourez's stance: it suggests a more relative view of constructing scholarly knowledge. Accordingly, it prompts us to take into account the epistemological points of view that we refer to, or, better, the ones we *want* to refer to, which then leads us to consider several elements: who said what, on behalf of whom or in the name of what, in which social, political, economic or historical context? Fourez explains this idea:

> "Recognizing the diversity of opinions does not mean reducing them to a level playing field or asserting that they are equivalent. What it does mean is knowing and recognizing that our vision of the world depends on our standpoint: this vision is specific to individuals, it is partial, even biased. It relates to what provides us with meaning (our beliefs, our presuppositions, our projects, our psychological wounds, our social environment and so forth). It also relates to our body, which imposes limits on our way of seeing […]. Thus, each human being knows and sees the world through a pair of glasses […]. However, despite the differences, we talk to each other, we can share our views, briefly, we live in the same world. Ways of seeing things are subject to standardization which, among other things, serves to foster communication" (2003, pp. 15-17) [translation].

To relativize in the classroom and to point out to students that there are several points of view (some that we adhere to, others less so), we may simply adopt an attitude of openness and modulate or qualify certain views. If a teacher holding a positivist view of knowledge usually asks his or her students to observe a phenomenon expecting that they will also view it with the same analytical framework in mind, he or she could, for example, begin by expecting individuals to observe the same thing in different ways, based on their values, prejudices and beliefs. In the same way, instead of stating, "the research proves that," the same teacher could now say, "some research convinces us of such and such a phenomenon, and in such and such a way…" Thus, students would undoubtedly have a somewhat more informed perception of the discipline's literature. Similarly, instead of presenting them with "the proof of a given physical phenomenon," the teacher could provide them with "a few examples that will help to understand this phenomenon," placing the examples in their context, in order to emphasize that there are, or may be, other ways of seeing things, although the focus in class will be the study of a particular theory.

Despite the fact we can never escape the uniqueness of our epistemological point of view and remain entirely neutral in intellectual terms, we can, however, "choose the eyes through which we wish to view the world" (Fourez, 2003, p. 11), to attempt to consciously answer the question "How do we know what we know?"

Now that we have seen what an epistemological stance can be in relation to specific disciplines, what about education? It goes without saying that to be able to properly plan their courses, teachers must also consider the prevailing trends in the field. Indeed, by engaging in reflection on such trends, pedagogues can rely on guiding principles and consider various approaches, which will help them orient their didactic strategies as well as their pedagogical interventions



concerning the content of their courses. Let us now examine the epistemological perspective on learning (and in turn, that of teaching).

ENGAGING IN LEARNING

Over time, the different ways of perceiving the construction of scholarly knowledge have influenced the concepts we have adopted regarding how knowledge is acquired. All of these visions have generated several theories of learning, including the cognitivist and the social constructivist approaches.[5] Thus, many trends in education could help us answer the question "How do we learn what we learn?" but also, the next questions:

- Do we learn through memorization? Through our experiences? Through discussions with others?
- Is it preferable to adopt a learning approach that favours a transition from simple to complex, or to begin with complexity?
- Are we always prepared to accept new knowledge, like a tabula rasa, or rather, are we equipped with interpretation schema that might organize the way we develop this knowledge (and that would be determined by our culture, our history, our experience, our previous education, for example)?
- Then what is the importance of the knowledge that students have previously acquired? To what extent should the teacher take this previously acquired knowledge into account?
- What is the role of error in learning? Should error be considered an inconvenience to be avoided or as an indicator making it possible to understand students' intellectual process? Should we attempt to understand the source of their errors?
- Does everyone learn in the same way? Are some people gifted learners?
- Is the teacher reproducing teaching strategies he or she has seen to be effective, the ones he or she experienced as a learner?

The answers that teachers provide will help them to define the idea they have formulated about the learning process and this will clearly influence the way they choose content and how they organize courses.

Of course, even if this enables teachers to make more enlightened pedagogical decisions, the mere fact of being conscious of their epistemological stance will not automatically simplify the course planning process, at least not from the moment they undertake reflection: every teacher has pedagogical habits and every individual has perhaps already thoroughly fine-tuned many of his or her courses. Nevertheless, if we were to take a fresh look at our practice, then some changes might suddenly appear to be required. For example, an activity that a teacher has always liked to suggest to students in class may no longer appear to be relevant with respect to the epistemological principles that have profoundly inspired the teacher or to the precepts the teacher wishes to focus on.

[...] each person's stance evolves over the course of his or her own disciplinary and pedagogical learning [...] and of his or her personal and professional reflection.

However, we must be careful not to cast doubt on all our course planning or to start over entirely from scratch. Moreover, the general concept of learning that we formulate should not automatically be applied in every case. To make changes to their teaching practices, teachers could, for example, begin by identifying the course content that often leads to problems: content with which they are not comfortable, content that always gives rise to many requests for individual assistance or content that students obviously have great difficulty integrating, and so forth. Having discovered that we have a social constructivist view of scholarly knowledge, for example, does not mean that all pedagogical activities we plan must fit with this view. We could very easily dip into positivism or falsificationism and cognitivism if these approaches lend themselves more easily to teaching certain concepts. The idea is to call on our professional judgment to choose the didactic and pedagogical strategies that will best facilitate student learning.

TWO-TIERED EPISTEMOLOGICAL STANCE[6]

To sum up, everyone's epistemological stance first of all matches his or her world view. More specifically, it is consistent with every individual's concept of the construction of the knowledge that constitutes his or her discipline. In education, this stance then influences the *didactic* choices of teachers

[5] To better distinguish between the various approaches currently prevailing in education, and more specifically, at the college level, I invite you to consult Danielle Raymond's synthesis in *Qu'est-ce qu'apprendre et qu'est-ce qu'enseigner? Un tandem en piste!* (2006).

[6] Several other "tiers", or types of relationships, may be associated with epistemology. Gagnon describes five of them in another article of this issue (29-1).

and the way they approach the subjects they teach (think of Houssaye's triangle, and more particularly, how it depicts the relationship between the teacher and knowledge).[7] In absolute terms, every teacher's stance should resonate, along several points, with collegues teaching in the same department. However, in cases where interdisciplinary projects must be implemented, this could also become a source of challenges, since such projects entail a greater variety of epistemological concepts that may be less compatible. This could explain the lengthy discussions that sometimes take place during program committee meetings!

From an individual perspective, a teacher's epistemological stance also cuts across, more generally speaking, his or her relationships with the *learning process*. Consequently, this stance guides the way in which all educators consider students and students' needs, and thus the choices they make in terms of pedagogical strategies, (here, let's think about the learning relationship associating the student with knowledge, illustrated in Houssaye's triangle). In this respect, visions may differ more widely within the same disciplinary family. The commonalities may perhaps link individuals who have taken the same pedagogical training or people in the same age group, who have learned through similar methods.

Epistemology calls on us to take a *different* approach to our interest in what knowledge is, in what we know, in what students know and must know, in the way in which we perceive learning, but also in the way in which students themselves see this process.[8] This is a major undertaking, which most certainly has a beginning … but undoubtedly, not really any ending. Each individual's stance evolves over the course of his or her own subject-specific and pedagogical learning, as well as through his or her personal and professional reflections. We must also accept that exploring the world of epistemology may send us into a bit of a spin, and at first, we may only partially understand our readings and discussions of the topic. However, over the course of our reflections, the ideas will come into sharper focus!

[7] To visualize this schema, refer to the article "Establishing a Distance Educational Relationship: Can it be done?" that Violaine Page published in a previous issue of *Pédagogie collégiale* (2015, p. 2).

[8] In an article in this issue (29-1), Annie-Claude Prud'homme proposes a series of questions that will help you with another way of defining your epistemological stance. See "The hidden origins of knowledge. Questioning our beliefs and knowledge so as to provide a more 'genuine' education".

DID YOU KNOW?

"It is not surprising to see education researchers attempt to structure their research processes based on those used in the natural sciences. Nor is it surprising to see […] biological perspectives, such as neuroscience and neurodidactics, gaining ground. The positivism model, considered more reliable and more objective, remains a reference on which many attempt to base their research in education […]. That it is difficult in the education sciences to isolate variables in order to establish causal relationships beyond all doubt, that is not possible, given the multiplicity of factors (cultural, social, biological, psychological, historical, familial, political and so forth) at play in learning processes, or that it is difficult to identify universal principles or laws, should not lead us to presume that the processes of formulating knowledge in the domain are unscientific. As such, what we might say about research in education is that it falls more within a form of intersubjectivity, objectivation, relationism […]. The resulting knowledge […] would be the fruit of a process of rational investigation that does not lead to positing absolute truths, but rather to proposing hypotheses and/or transitional solutions that are considered the most appropriate with respect to available frameworks and information" (Gagnon, 2015, p. 135) [translation].



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