

# Questioning as an Epistemic Process of Critical Thinking

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## Introduction

The idea of questioning one's idea is regarded by many as an affront. This attitude towards questioning suggests that it is rude, especially when it is persistent. Questioning is considered a way of casting aspersions on one's ability or the reasonableness of one's view. Questioning is often taken to mean that one is not making a good point or one is not articulating one's ideas properly. As a result, questioning tends to engender a defensive response. This attitude has a long tradition. It was responsible for how Socrates was received by Athenians, and why he was eventually killed. By questioning persistently for justifications and clarifications, Socrates got on people's nerves and sometimes humiliated them; he made people realise they did not quite know what they thought they knew. This angered them. Socrates argued that the attitude of wanting one's ideas to be always 'validated' and not questioned is intellectually stagnating and is a mark of 'ignorance'. He pointed this out in his idea of 'wisdom'. A wise person is one who is *always* willing to 'learn'. Such a person assumes tentatively that she does not know. She is willing to methodologically suspend her belief and question it for the purpose of exploring it, to expand her knowledge. The process of questioning—for the purpose of eliciting information and adequate justifications—represents an epistemic attitude which is necessary for critical thinking. Such attitude is often what teachers want to engender in students as critical thinkers.

In this paper I explore, in general, the sense in which questioning may be regarded as an epistemic process of critical thinking and I offer a theoretical foundation and argument for encouraging such process. More specifically, I do this by analysing the notion of questioning, to show its logic as an open-ended process of inquiry and its function, as a process of critical thinking. Critical thinking involves a disposition to a rigorous process of inquiring, learning and acquiring knowledge, in terms of rationally evaluating and justifying beliefs. I argue that the open-ended logic of questioning reveals its epistemic feature and heuristic value as a process of critical thinking. And that the epistemic value of this process is given credence and motivated by human fallibilism. The realisation of such fallibility and the effort to avoid or correct errors is a motivation for critical thinking, construed in terms of fallibilistic epistemology. The epistemic value of questioning is usually not adequately appreciated, hence its negative connotation. An appreciation of the plausible

epistemic basis and value of questioning may obviate the negative connotation it engenders. This apparent problem unduly hangs clouds over questioning as an epistemic process and a pedagogical tool.

Any theoretical effort to motivate questioning as a process of learning and teaching will be adequate only if it is sensitive to this problem. We should bear in mind the theoretical connection between the process or method of learning or acquiring knowledge (epistemology) and the tools or methods for teaching (pedagogy). The process or method of imparting knowledge, teaching and helping people learn and the process or method of acquiring knowledge are theoretically co-extensive. As such, questioning may be a valuable tool for teaching and learning critical thinking skills. I do not provide a *detailed* description of how this strategy could be used in class the way Hyman (1979), Dillon (1983) and Blosser (1973) do. I only provide a theoretical foundation and justification for its use in relation to teaching and acquiring critical thinking skills and abilities. Thus my concern is whether there is a way to motivate questioning or highlight its value both as a process of acquiring knowledge and of teaching, to make it appealing. I suggest that exploring the logic, epistemology and functions of questioning as an epistemic process of critical thinking may be able to do this. In order to appreciate how questioning may be construed as an epistemic process of critical thinking, we need to understand the nature of critical thinking and its plausible motivation. We may start by addressing the following questions: (1) What is critical thinking? (2) What are its epistemological features and motivation? (3) What are the logical and epistemological nature and functions of questioning? (4) How does the nature and function of questioning make it a process of critical thinking?

### **Fallibilism and an Epistemic View of Critical Thinking**

Critical thinking involves the rigorous process or method of ascribing reasonableness to a belief. In Goldman's view (1986), an epistemic theory of justified belief is necessary to account for a justifiable ascription of reasonableness to a belief. A plausible epistemic conception of the process of critical thinking may be couched in terms of a normative fallibilistic epistemology. This view is grounded in the fact of human fallibilism, the limitations in human cognitive abilities, our awareness of such a fact and the conscious effort and willingness to avoid or mitigate such fallibilism. Such effort or willingness involves adopting a rigorous and critical attitude for evaluating a belief, which requires that we be tentative about the reasonableness of our beliefs and that we be always open to other plausible evidence or counter evidence. Fallibilism in this sense implies that we accept a belief tentatively in the context of the currently available evidence. We may need to distinguish between substantive skepticism and fallibilism (which is a kind of methodological skepticism). Substantive skepticism says we do not or cannot have knowledge. This view is considered incoherent because to say that we do or cannot have knowledge is to imply that we do in fact have some knowledge, which is that we cannot have knowledge. Fallibilism says we could be mistaken but grants that we do in fact know some things. The implication of fallibilism for critical thinking is that we should

adopt stringent methods, whereas the implication of substantive skepticism is that there is no need to try.

An epistemic view of critical thinking specifies *how* we ought to acquire and justify beliefs. This process must involve rigorous inquiry and the critical analysis and evaluation of evidence. The normative view regarding how we *ought* to acquire beliefs implies that we have an epistemic obligation to use the appropriate method or process that will lead to reasonable beliefs. If we do not, there is a reasonable basis to make an epistemic judgement that we do not have a reasonable belief. However an epistemic theory must be sensitive to human fallible cognitive processes, which are the causal and justificatory basis for acquiring belief. These causal processes and beliefs are circumscribed by and contingent on the facts about one's context and condition. So the normative view of fallibilism is *parasitic* on some factual properties and conditions about human fallibilism. The normative view presupposes, in part, that we are cognitively capable of using the normatively prescribed process or method. One needs to appreciate the distinction between the factual and epistemic claims about fallibilism in order to understand the plausible connection between them, as a way to illuminate the epistemic notion of critical thinking. The epistemic claim of fallibilism involves a prescription to adopt critical thinking process and attitude regarding what ought to be considered knowledge. It specifies the rigorous standards by which we determine whether one's belief is justified or reasonable. To the extent that we are aware of our fallibility, we should make reasonable efforts to guard against, avoid and correct our errors. This involves being tentative and methodologically skeptical (McPeck, 1981). It involves questioning and 'methodologically casting aspersions' on beliefs and evidence, being open to new evidence and being willing to change one's beliefs with new evidence. This process is methodologically adversarial and confrontational.

According to Siegel (1988), fallibilism is 'the thesis that all our knowledge-claims are open to revision and are possibly mistaken' (p. 145n). This statement regarding the nature and motivation for critical thinking is ambiguous in a sense. It could be understood as a factual thesis about the nature of human knowledge-claims. It could also be understood as a normative statement regarding how we ought to determine the nature of a knowledge-claim. This is the view that is directly relevant to the nature of critical thinking as an epistemic process of inquiry. We need to know how such factual statements may motivate an epistemic view of critical thinking as a process by which we ought to reason, acquire beliefs or engage in inquiry. Fallibilistic epistemology, as a normative thesis, says that *S* knows that *q*, if and only if there is a justification *r* for *S*'s belief that *q*, such that *r* being a confirmed and 'undefeated' evidence for *q* only makes it highly probable that *q* is true. This theory allows a person to know 'something' on the condition that a plausible justification exists in support for what one claims to know, such that the supporting evidence being well confirmed and 'undefeated' only makes it reasonable to believe that what one claims to know is highly likely to be true. Fallibilistic epistemology implies that if a belief is well confirmed and we have no negative evidence or 'defeater' to vitiate our justification, we hold it as conditional knowledge or justified belief in the given context of relevant alternatives and available evidence. By the process of question-

ing, we are able to get new information to improve our state of knowledge, such that when the hitherto warranted evidence no longer supports our beliefs, we are bound to modify our beliefs.

There is a plausible universal and intuitive appeal for fallibilistic epistemology. Part of this appeal derives from the obvious truth that human beings are by their nature susceptible to error. Human beings realise as part of their rationality that they are fallible, and this is reflected in their cognitive processes which play an important role in their process of acquiring, justifying and modifying beliefs. Our *perception* and *reasoning* are susceptible to error, and since knowledge is a product of either the process of reasoning or perception or both, it is invariably susceptible to error—as a function of the ‘faulty’ process. However people have strong intuitions that we do know many things. Fallibilistic epistemology is the attempt to articulate a theory of knowledge, which will square with our common-sense view that we do know many things, and that we are also susceptible to error. It is an attempt to avoid substantive skepticism in spite of our fallible cognitive processes. Fallibilism provides a foundation for Nicholas Burbules’ (1991) conception of critical thinking as reasonableness, which he argues, involves ‘being willing to admit that one is wrong’ (p. 250). Such reasonableness suggests that we are willing to evaluate evidence and that we make concerted efforts to provide adequate justifications. Since we can be in error, we should not *immediately* accept a belief without proper examination. Critical thinking specifies a set of attitudes, processes, methods and contexts which will facilitate our ability to do inquiry, to avoid and correct errors so as to arrive at a reasonable belief. Such attitudes include, according to D’Angelo (1971), open-mindedness, intellectual curiosity, flexibility, intellectual honesty, methodological skepticism, persistence, objectivity and respect for views (pp. 7–9).

The plausible connection between the factual and epistemic claims of fallibilism—in terms of the factual claim motivating the epistemic claim—may be illuminated by the ‘ought implies can’ principle. What we *ought* to do implies what we *can* indeed do. If we cannot do something, then it is unreasonable to expect that we ought to do it or make a judgement about us on the basis of a standard which we cannot achieve. This suggests that we may not hold one ‘epistemically responsible’ persona or epistemically evaluate one’s belief on the basis of what it is impossible for one to do or avoid doing. So considerations about how we ought to acquire knowledge or what ought to be considered knowledge (epistemic claim) has to be sensitive to, or parasitic on, considerations regarding how we can possibly acquire knowledge and what we can possibly know (factual claim). If we ought (or are expected) to acquire knowledge or justified belief by the process of questioning and critical examination, then (1) we must, given our cognitive abilities, be capable of engaging in such process, and (2) the conditions and context which support such processes of questioning and examination must exist. Such context includes what Bridges characterises as moral preconditions, namely: reasonableness, receptivity, peaceableness, orderliness, truthfulness, freedom, equality and respect (Bridges, 1979, pp. 21–24). These conditions imply that we do not see questioning as critical thinking ability in a negative light; we should be receptive to it instead. They imply that we provide a motivation for the requisite abilities and investigate the ‘*contexts* that support

or encourage them; and into the barriers that impede them' (Burbules, 1991, p. 250).

The epistemic importance of the plausible connection between the factual and normative theses of fallibilism with respect to critical thinking has to do with the idea that the factual thesis and our realisation of such fact engender that we set a high and rigorous standard for acquiring knowledge, with a view to avoiding or correcting errors: this is the motivation for critical thinking. The fact that our knowledge is only highly probable (given human fallibilism) implies that there is a window of opportunity for one to be in error. Insofar as such a window exists, no matter how small, we should be committed to questioning and critically exploring it. This is because the most reasonable belief is one which approximates *the truth* and is held by one based on critical thinking. Truth in some metaphysical or logical sense is an ideal (Popper, 1985; Russell, 1965) that we are trying to epistemically get at by a process of inquiry. This requires that we engage in the process of critical thinking which is more likely to get us closer to such an ideal. It is assumed that given our fallibilism, we may not know what *the truth* is or arrive at the ideal, in terms of the true metaphysical nature of reality. Truth in this metaphysical sense is the actual state of affairs or reality itself in terms of what Kant calls the *noumena*, to which statements approximately correspond. It is in this regard that Popper sees truth epistemically as a verisimilitude.

Human knowledge can be conceived only in terms of a verisimilitude because it is based on induction, the 'defeasibility' of available evidence, and susceptibility to error; this necessitates critical thinking. The more rigorous our critical thinking and the more the belief is confirmed via such processes, the nearer to the truth our knowledge will be and the more reasonable. Bertrand Russell (1959) argues that most of our beliefs are based on induction, and we accept them because they have a probability of being true. The higher the probability the nearer we are to truth, but we may never reach the truth because there is always the possibility of error. He concludes that the highest probability is all we ought to seek via a critical process; it is all that we can achieve. To accept a belief as *the truth* (as opposed to an approximation of the truth or the most reasonable belief) is, in some sense, to say that the belief is no longer open to question or further consideration of new evidence. The inquiry is closed! This attitude is considered in many relevant contexts as dogmatic. This is inconsistent with the idea of critical thinking and fallibilism. So the attitude or principle of rigorous inquiry which a critical thinker must have entails an understanding of the criteria for assessing reasons offered for the justification of one's beliefs and being able to apply these criteria. This idea is couched in the normative notion of 'reason' and its cognates, such as rationality, evaluation, justification, reasonableness, assessment and judgement, which feature pervasively in the different conceptions of critical thinking. To think critically involves being able to question and evaluate beliefs in order to optimise the reasonableness of a belief. This is a process of placing evidential strictures on one's doxastic attitude and the process of justification, to approximate *the truth*. After critically evaluating and questioning a number of evidence, then one is 'moved' to make the judgement that there is adequate evidence to consider it reasonable.

It is in this sense that Siegel (1988) argues that critical thinking involves being ‘appropriately moved by reasons’ (pp. 32–42) to accept a belief after a rigorous process of questioning. This involves using the reasoning skills, critical dispositions, attitudes and habits that are required to assess statements, beliefs and issues as a basis for accepting them as reasonable. He accepts that the criteria by which we assess the appropriateness of the reasons which ‘move’ us to accept beliefs as reasonable are fallible, open to revision and are possibly mistaken (p. 145). Thus critical thinking ‘may include the use (or rejection) of methods, strategies and techniques as exemplars’ (McPeck, 1981, p. 13), which requires questioning our fundamental methods. This suggests why we may not accept a belief as *the truth* such that we regard further inquiry closed. Critical thinking process suggests some strictures which may help us to minimise our fallible tendencies. Siegel (1988) makes this point rather ambiguously with respect to the connection between critical thinking and fallibilism, when he argues that ‘Fallibilism... requires that we keep open the possibility of criticising the very criteria of legitimate criticism we utilise’ (p. 144n). It is not clear whether it is the fact of human fallibilism and our awareness of it that requires this or the epistemic standard regarding how we ought to know, or both, in the sense that the epistemic is dependent or parasitic on the factual. So a robust sense of critical thinking may be seen as a fallibilistic epistemic *process* of questioning and evaluating statements, beliefs, arguments, knowledge and experience.

Being able to question as a rigorous process of inquiry, to evaluate evidence and determine the reasonableness of a belief, is regarded as the hallmark of a critical thinker, who is also regarded as the paradigm of a liberally educated person. This process implies that all *available evidence*, assumptions and general network of beliefs in a given context be questioned and critically examined and evaluated. This, according to Paul (1982), involves a broad view or a ‘strong’ sense of critical thinking. This involves, (1) the avoidance of atomistic view of logical errors in individual reasoning, (2) a concern about self-deception with respect to reasoning, and (3) the disposition of a person in a given context to have a reasonable doxastic attitude. It also requires some sensitivity to the psychological, sociocentric, cognitive and egocentric components of one’s world-views, which shape one’s beliefs and reasoning. The ‘strong’ sense of critical thinking requires the exploration of the network of arguments, issues and views as the context for justification, in the attempt to ‘depersonalise’ one’s world-view. This strong view demands that people be willing and encouraged to actively question, challenge and criticise their most fundamental beliefs.

A core feature of some conceptions of critical thinking involves having a disposition, attitude, and willingness, (1) to *actually use* one’s abilities to effectively analyse issues, solve problems, reason, organise and express ideas, and make reasoned judgements, and (2) to contextualise the use of these abilities to different relevant subject matters. According to Morgan & Wayne (1995), one of the points ‘of agreement among the definitions concerns the *effective component* of critical thinking. Critical thinking is dependent upon a person’s disposition to use it’ (p. 338). Critical thinking involves a disposition which depends on a context that

allows for its development and use. Hence the process of questioning needs to be taught in the context of a subject matter. We also need to teach how it is best used to achieve the requisite result. This idea is illuminated by Aristotle's view of virtue. Critical thinking involves, in some sense, the practical disposition to be epistemically virtuous. Such virtue would emerge only if someone learns to do virtuous acts all the time and thus forms the habit of doing virtuous acts; this requires a context which engenders such disposition and actions. Hence many theorists (McPeck, Siegel and Burbules, among others) see critical thinking as a set of intellectual behaviours and abilities which have to be used, nurtured and demonstrated—but only when such a context exists.

### **The Logic and Epistemology of Questioning**

Hintikka argues that a striking feature of questioning as a philosophical method, and in my view as an epistemic process, is its inherent open-ended process, in that there is the possibility of one question to lead to another. The process of questioning implies that it has the logic of open-ended question-and-answer sequences. Questioning implies a process of continuously opening up issues about the reasonableness of a belief; it requires providing better evidence or counter-evidence. This idea is coextensive with the idea that, with better evidence or counter-evidence, what we thought we knew could in fact be false—which is the idea that we are indeed fallible. The epistemic standard of fallibilism which is parasitic on this idea or fact about human fallibilism provides a theoretical motivation for critical thinking, which involves the need for us to acquire and adopt a fallible disposition and critical attitude. Such an attitude or disposition involves using the process of questioning to critically engage in inquiry. Such an attitude can be learned if one can be taught to appreciate the logic, functions and significance of questioning with respect to knowledge acquisition. However it is pertinent to address more precisely the logic of questioning as an open-ended process. In this regard, Jaakko Hintikka's analysis of questioning as a philosophical method may illuminate its nature as an epistemic process of critical thinking. In his analysis, he argues that questioning 'offers a useful model for many different types of knowledge-seeking' (1984, p. 25). These types of knowledge-seeking include, in my view, learning, inquiring, eliciting information, reasoning, evaluating evidence and determining the reasonableness of a belief.

Hintikka construes questioning as having a logical structure, which involves a question-and-answer sequence. A question has a logical correlative in terms of an answer, which provides the information being sought by questioning. It is by virtue that this logic may be seen as an epistemic process of critical thinking, to the extent that critical thinking involves the process and attitude of being always open to new evidence and questioning one's evidence and the reasonableness of beliefs. This logic implies that we should never dogmatically accept a belief or regard any issue as settled. However we may accept that an issue is tentatively settled and a belief is unquestionable given the evidence we have. To regard an issue as unquestionable implies an attitude of dogmatism which is opposed to the fact that we may be mistaken. This is also akin to the idea of critical thinking insofar as critical thinking

is opposed to dogmatism. To the extent that questioning has the logic of opening up a new set of question-and-answer sequences and the opportunity to be open to new evidence it is not dogmatic. The logic of questioning implies that we have the attitude that we may be mistaken. This logic indicates its value as an epistemic process of critical thinking. This logic is manifested in our ordinary use of language. When we say that the point is 'unquestionably' correct, this implies that the issue is resolved, it is understood and no further questions may be asked to explore it further. But if it is questionable, then it has to be explored or clarified further. By this open-ended logic of questioning, 'we can discuss and evaluate, not just someone's state of knowledge at a given time (*vis-a-vis* the evidence one has at the time) but also entire strategies of knowledge-seeking' (Hintikka, 1984, p. 30).

Anytime a person asks a question, she is seeking information in the form of an answer. This information seeks to eliminate some plausible alternative answers to the question. For instance, the question 'What caused the American civil war?' suggests that there is a logical correlative in terms of an answer, 'x caused the American Civil War.' The question seeks information regarding x, which 'is a conclusive answer if and only if it provides the questioner with the information that was requested' (Hintikka, 1984, p. 27). For this information to be knowledge, (1) it must be true or at least likely to be true, (2) the person who provides it is honest, serious and sincerely believes in it, and (3) it is backed up by sufficient and 'undefeated' evidence. When the information is presented to the questioner and she accepts it, it becomes reasonable for her to say truly 'I know that so-and-so caused the American Civil War'. The information presents a factor in a possible range of factors that may have caused the American Civil War. The information may not imply that one and only one factor caused the American Civil War. The person who provides the information must not absolutely believe that one and only one factor caused the American Civil War. Her belief or answer can be further questioned or explored to determine its adequacy and reasonableness. There may be other information, evidence, factors and insights that have not been explored which may justify one's belief.

This idea is given credence by the iterative nature of justification which might be understood against the background of human fallibilism. If I use *x* to justify my belief *y*, then I need to justify *x* with *z*, and *z* with *w*, and so on. Hence a belief is reasonable only in the context of evidential or inferential relations among all available beliefs and evidence. Thus the value of any answer is determined in terms of the information it provides for the questioner in the context of the inferential and evidential relations among all available evidence and accepted beliefs and the opportunity and possibility for it to lead to further indeterminate question-and-answer sequences. However an answer to a question may not satisfy a questioner. In this regard, the notion of questioning has a psychological correlative, which is the expectation that an answer should provide some information and satisfaction. This derives from the idea that an answer must satisfy our curiosity and make sense, in that we believe it is likely to be true based on its evidential relations to our background beliefs, meta-beliefs and conceptual scheme. We are then emotionally

satisfied by an answer if it makes sense to us; it is consistent with our coherent set of beliefs; hence it is considered justified.

If the information is inconsistent with our system of beliefs and our expectation of what the 'correct' answer should be, then we are not likely to be satisfied with the answer provided. Such inconsistency provides an uncomfortable feeling of dissatisfaction with the answer provided. The process of questioning helps us to critically think and reflect on our background beliefs and the inferential relation between answers and our beliefs, to make sense of it in order to satisfy us. Thus questioning is a powerful epistemic tool, with tremendous value in that it allows us to regard any issue as open—it is not unquestionable. This open-ended logic of questioning, Hintikka (1984) argues, derives in part from the fact that questions are usually not asked in vacuum, but within the context of some assumptions, background beliefs, meta-beliefs and the available information. There are explicit or implicit evidentiary and inferential links between assumptions, evidence or justification, and answers or beliefs, which questions, and the process of questioning, seek to bring out, to get a satisfactory answer. In this regard, questions and answers are context- or theory-laden in the same way in which the reasonableness of a belief is contextual in relation to the available evidence. This gives credence to the idea that critical thinking as a process of questioning and determining the reasonableness of a belief is also contextual (Burbules, 1991). The assumptions and context that underlying questions raise are in themselves antecedent questions, which have to be answered in order to provide adequate information which may illuminate the target question. Just as a question presupposes other questions and answers, an answer is also provided within the context of assumptions about other questions and answers. These assumptions may raise questions which have to be answered, to see how the individual who provides an answer 'makes' the logical question-and-answer connection or the inferential connection between belief and evidence. This includes observational or perceptual beliefs and evidence. What we claim to know, as the basis for answers, may derive from observations and beliefs. They are a kind of inference which is made on the basis of our conceptual scheme, background beliefs and meta-beliefs. Critical thinking in this regard involves the process of questioning, examining and evaluating beliefs to determine whether our experience and beliefs are warranted. We may say that the process of observation involves critical thinking: that of making a reasoned connection between our conceptual scheme or background beliefs as evidence and our perception. For instance my ability to adequately observe, justifiably believe, identify or know that a certain object is a chair suggests that I do have some concept of a chair. This means that the object that I perceive falls into the conceptual category of things that I think of as 'chairlike'. So if my concept of chair is correct, and my 'perception' of the features of the object is correct, my identification of the object as a chair cannot be false; it follows necessarily from my premisses. We can 'see' and evaluate a conceptual scheme and the reasoning process of making observations by asking some appropriate questions.

If someone asks me why I identify *x* as a chair, I would answer by providing the necessary and sufficient conditions for what I think must hold for an object to be

designated as a chair. I would catalogue the relevant features of a chair that the thing  $x$  has and I would say that it is as a result of these features that I have categorised  $x$  as a chair. You will then have an idea of my beliefs about the nature of a chair, the object  $x$ , and my reasoning in terms of how I make the connection between my idea of the nature of a chair and the features of  $x$  as observations or beliefs. The fact that a question-and-answer sequence has the possibility of generating other series of question-and-answer sequences suggests that there is always the possibility of exploring the context and assumptions which underpin the questions and answers. This helps one to come to grips with one's fallibilism and assumptions which were not obvious. If a set of assumptions is seen as plausible, then one is able to know this in relation to one's belief and answers. If they are not plausible, then they have to be jettisoned, modified or changed. This idea of seeing a network of assumptions and beliefs and questioning or examining them is what is captured by Paul's (1982) view of 'strong' critical thinking. When certain assumptions are questionable and therefore questioned, then one realises that the basis for one's answer is suspect. One can reasonably see how such assumptions may contaminate one's answer for one to be mistaken. One may see how differences or similarities in assumptions, evidence and reasoning may illuminate a view and make it understandable. This realisation may engender the process of critical thinking and a positive attitude towards questioning.

### **The Functions of Questioning: epistemic and pedagogical implications**

From the analysis of logic questioning, we can, in some sense, see some of the functions it performs and their epistemological and pedagogical implications. Questioning performs the functions of increasing our overall knowledge, which may result in our ability to avoid or correct errors because we are fallible. It helps us to get a deeper understanding of issues. In this regard, we may identify two fundamental functions of questioning. The primary function is that it is information-seeking. An answer to a question provides information which adds something to the epistemic state of the questioner. The secondary function is that it engenders critical analysis. Questioning can help us to explore issues about the initial information provided, to determine its adequacy. This secondary function of questioning includes, among others, challenging and criticising in a positive and constructive way, to help people explore their ideas. The questioning that proceeds after an initial question has been answered may be for the purpose of exploring and providing new perspectives. This could be in the form of playing the 'devil's advocate', in order to provide an opportunity for both the questioner and the questionee to *reflect* on a belief and the underlying reasoning or evidence. The function of questioning is illuminated by its logic, which is similar to the logic of dialectics. Such a dialectical process involves seeing the answer to a question as a thesis, which can be further questioned to arrive at an antithesis. The antithesis can in turn be questioned to arrive at a synthesis, and this may be seen as a different thesis which can be questioned *ad infinitum*. This open-ended nature of questioning involves a method of moving knowledge and inquiry forward.

With respect to the primary and secondary functions of questioning, we may distinguish between *fact-finding questions* and *analytical questions*. Fact-finding questions are questions which require one to supply informational facts which are verifiable. For instance, I may ask, ‘On what date did America become an independent country?’ or ‘Who is the author of Macbeth?’ These questions are fact-finding, in that they are seeking specific answers in the form of facts which can be verified. The notion of ‘information-seeking’ is broader than the notion of ‘fact-finding’. One may seek information in terms of opinions or ideas which may not constitute facts. If, for instance, I ask in an Ethics class, ‘What is your stance on abortion?’ or ‘What is the argument for your stance?’, I am seeking information about a plausible opinion and reasons which are not facts as such. These are not fact-finding questions but are information-seeking; thus, all fact-finding questions are information-seeking, but the converse is not true. An analytical question is one which requires one to explore, explicate, examine, clarify, dissect, reflect on and relate issues or ideas. Analytical questions unlike fact-finding questions might help to elicit the reasoning behind an idea in order to fully unpack it and make it accessible and understandable, such that the reasonableness of the idea may be evaluated and determined.

The following may constitute a systematic sequence of analytical questions in social and moral discourse: What do you mean when you say all humans are equal? What does equality mean? Can we distinguish between *factual* and *prescriptive* equality? In what sense are all human beings equal? Are you saying that as an adult, I am equal to a one-year-old baby? Do you want to suggest that a medical doctor should receive the equal wage to a cashier in a McDonalds restaurant? These questions do not seek facts as such, but they seek to explicate and analyse issues and concepts. These analytical questions are information-seeking in the primary sense; they open up the opportunity to ask further exploratory questions, to improve one’s epistemic state. So analytical questions may be information-seeking as well. Hintikka draws an analogy between the analytical-information-seeking variant of questioning in interrogation and deductive reasoning (1984, p. 35). He provides an example of this in Plato’s dialogue, *Meno*, which shows how by questioning, Socrates helped a slave-boy to analytically elicit complicated knowledge of geometry. This represents a classic case of how appropriate questioning may help someone to unearth tacit knowledge or unpack complex and implicit meaning of concepts. In this sense, analytical questions involve a process of critical thinking, in that they seek to explore implicit meanings, inferences, underlying assumptions and justifications. They involve exploring implications of ideas and the evidential or causal relations among evidence, ideas, contexts, patterns and trends.

From the distinction and characterisation of fact-finding and analytical questions, we can see that statements regarding the evidentiary or inferential connection between answer and question may be either *a posteriori* and synthetic or *a priori* and analytic. For instance, a question may be a way of requesting that one makes some analytic connections between two sets of ideas in order to clarify meaning. For instance, one might ask, ‘What do you mean when you say Jane is a spinster?’. The answer would be, ‘I mean that Jane is an unmarried female’. The question requires that one articulates the idea of ‘spinster’ which is not fully grasped by the questioner

in terms of 'unmarried female'. A question could also be a request for one to be *aware* of and to *reflect* on one's tacit reasoning process or belief. In making the connection between inference or reasoning (which has relevance to the notion of critical thinking) and questioning, Hintikka (1981, 1983) argues very forcefully that what people call 'inference' or 'deduction' in a nonphilosophical parlance is actually a sequence of implicit question and answer. We sometimes see this in a court of law where a lawyer may use questions to elicit a set of answers from witnesses, from which she makes inferences and connections as a basis for making her cases, and by which a judge or jury decides a case regarding guilt or innocence. The questions in this case elicit tacit or implicit information.

The principle of fallibilism, which requires us to be methodologically tentative about our beliefs, is a motivation for questioning, as a process of seeking information, activating tacit knowledge, evaluating evidence and examining beliefs. This principle governs the quest for the best deductive procedures (Hintikka, 1981, 1983). It has to do with a process of infusing rigour into inquiry, making sure that there is consistency or coherence among beliefs and that there is appropriate justificatory connection between belief and evidence. The truth of a proposition in a deduction is evidentially transmitted to other propositions that it entails to form a consistent and justifiable set of propositions. This principle explains how we rationally form, justify, modify or change our beliefs. However it is pertinent to distinguish between the *proper* epistemic sense of questioning, that which performs the above functions and has the requisite logic and heuristic value, and the *attenuated* senses of questioning, which may legitimately engender negative attitudes. Some of these attenuated senses of questioning are used in a confrontational manner for badgering and as a rhetorical device. These senses my analysis of questioning as an epistemic process of critical thinking wants to delegitimise, to obviate the negative attitude. Questioning is supposed to help build a bridge between a questioner and questionee in terms of the each sides cognitive state; such possibility is vitiated by the negative attitude associated with it. If I ask a question with the expectation that you will understand my question and provide me with a plausible answer, then my assumption is that we do at least have similar or coextensive background beliefs or cognitive abilities. We have ideas about the nature of rational processes or background and meta-beliefs that a person should have in order to engage in a meaningful question-and-answer sequence for the sake of examining issues and improving knowledge.

### **Critical Examination of Questioning as a Process of Critical Thinking**

In the Humanities, analytical questioning is used to explore the components of an issue, the reasoning behind views and beliefs, and their implications, such that one can come to a better understanding, and perhaps, different ways of looking at an issue. This point is usually not well appreciated by many students. They think that learning involves knowing the correct answer to a question, which is synonymous with knowing the truth. Thus they are more interested in finding the true answer to a question. Once we have arrived at an answer which represents the 'truth', the

inquiry ends. Their view is that the notion of truth is absolute. We should not question the answer any further to explore its implications, assumptions, merits and flaws. Although some students appreciate the importance of an intellectual inquiry in its attempt to arrive at truth, they do not seem to appreciate the importance of the rigorous, analytical and critical process for arriving at truth: that the rigour of the process determines in part the reasonableness of what is accepted as true. Such reasonableness depends on the adequacy of the evidence and the method bringing evidence to bear on our beliefs. As far as many students are concerned, if questioning has any merit at all, it is vitiated by what is considered its adversarial and confrontational approach, which engenders a negative attitude. This attitude towards questioning is similar to Moulton's (1983) attitude towards the method of analytic philosophy. She argues that this method involves constantly looking for better reasons and counter-examples to refute or rebut another person's argument. She argues that this method is fundamentally adversarial and it is not conducive for learning philosophy. Although Moulton's argument is instructive regarding the attitude associated with the adversarial method, she does not address the adequacy of the rigour of such a method. One gets the impression that she is suggesting that the adequacy of the rigour of the method is irrelevant insofar as it engenders a negative attitude.

However if questioning is seen as reflecting this adversarial approach, then one can appreciate why, according to Moulton's arguments regarding the negative attitude, it may not be seen as a tool that is conducive for teaching and helping students learn. It is also pertinent to mention that if one appreciates the heuristic value of questioning, the negative attitude it generates may be for the most part deemed unwarranted. One heuristic value of an argument for questioning in relation to fallibilistic epistemology is that it represents the falsification method of inquiry in science. Science is generally accepted as involving a paradigm case of rigorous inquiry. Questioning represents the rigorous process of testing a belief as a hypothesis. In an attempt to falsify it, we question the reasons and evidence that are brought to bear on it. This process, which many have characterised as critical thinking, may be uncomfortable. Because people usually emotionally invest in their beliefs, when the beliefs are deemed to be flawed or unjustifiably held, it appears as if they have lost their investment. This is the idea reflected in the old saying 'if ignorance is bliss it is folly to be wise'. The corollary of this idea is that if wisdom is unpleasant, then it is appropriate to be ignorant: if the process of learning and acquiring 'wisdom' is not pleasurable, then it is *apparently* more comfortable to be ignorant. A learning *process* is a humbling process, thus it is unpleasant. But the actual *feeling* involved in one's *realisation and state* of knowing (as opposed to the process of knowing) is pleasant, hence it is unpleasant if it turns out we do not actually know what we thought we knew. It is in the sense of such a possibility that learning, which derives from critical thinking, is an on-going, never-ending process. We always entertain doubt and question in order to expand our knowledge. Thus the rigorous process of acquiring knowledge is open-ended; this suggests why, given fallibilism, the open-ended logic of questioning is coextensive with the open-ended process of acquiring knowledge.

However the open-ended implication of questioning and the indeterminacy of question-and-answer sequences could be seen as implying an unsatisfactory epistemological position. This is the position of perpetual or absolute skepticism, which is that, since we cannot be certain about our knowledge because we could be in error, therefore, we cannot have knowledge. If we cannot be certain about any belief because it is *always* open to question (not ‘unquestionable’), then it is not worth the name knowledge. So if we can always doubt our knowledge, it seems to follow that we do not know, since what we know should not be susceptible to doubt or error. This conclusion is a *non-sequitur* because the fact that we are sometimes in error (fallibilism) does not imply that we are always in error (skepticism). By a non-vacuous contrast, if we know when we are in error, then we should know when we are not likely to be in error. We do have strong intuitions that we know many things. The implication of open-endedness, Hintikka (1984) argues, should not count against the value of questioning as a philosophical and epistemic tool; hence, in my view, it can be used as a tool for teaching and learning. He argues instead that this view of questioning highlights its heuristic value as a methodology of learning and imparting knowledge. That it implies this interesting epistemic situation is a strong reason to favour it; it involves the process of exploring and examining beliefs to avoid dogmatism.

However the fact that questioning can help us avoid dogmatism and move knowledge forward, in terms of the possibility of highlighting a lack of appropriate justification, it may lead to the frustration that we cannot arrive at *the truth*, especially in the Humanities, where many of the issues are abstract and conceptual. This is an indication of human nature with fallible cognitive processes; we should neither be frustrated about it nor lament it. Since questioning as an epistemic process helps to foster growth in knowledge, to avoid questioning is to foreclose growth in knowledge that may be brought about by new and rigorous perspectives, and to tend towards dogmatism. The connection between questioning and critical thinking can be understood, in part, by seeing that they are both conceptually grounded in the theory of fallibilistic epistemology—which is motivated by the facts about human fallibilism. In this sense, at least, they are conceptually coextensive. However we may also see questioning as theoretically motivated by fallibilism, where the process of questioning involves the process of critical thinking. Fallibilism helps us to make sense of the open-ended nature of the logic of questioning as a process of acquiring knowledge. Questioning and critical thinking both involve a process by which we are sensitive to human fallibilism and are able to bring about approximation to truth and progress in knowledge.

We are able to bring about progress because, by the rigorous process of questioning involved in critical thinking, we unearth and explore what we did not know before or initially see as reasonable. We question and justify our beliefs so that those that are justifiable will be sustained and those that cannot be justified will be further questioned, examined, modified or changed. But the converse, that progress implies questioning with respect to rigorous critical analysis is not necessarily true, because progress could arise from guesses, fortuitous revelations and accidental discoveries without any concerted and rigorous efforts to question, inquire and examine. Given

the plausibility of these statements, by *modus tollens*, to deny growth implies the denial of rigour inherent in questioning regarding critical thinking. An important character and value of rigorous and critical inquiry is its ability to bring about progress in knowledge. This is engendered by the process and method of questioning. This argument may be illuminated by Thomas Kuhn's (1970) conceptual distinction between 'normal' and 'revolutionary' sciences. Kuhn argues that 'revolutionary' science has rigour, because it involves questioning and critical examination; this involves seeking new evidence, trying to falsify old theories, thus facilitating progress and growth in human knowledge.

The concept of critical thinking and the associated principles and process involves being able to eschew dogmatism and avoidable errors. This epistemic process of eschewing dogmatism requires that we be appropriately moved by reason, which involves, according to Siegel (1988), 'a proper understanding of the relevance of reasons and the rules of inference and evidence' (p. 43). This idea is captured by the notion of 'constructive' questioning or criticism, which is a rigorous process by which one may systematically bring evidence to bear on belief, to bring about growth and progress in knowledge. Lack of such process can lead to intellectual stagnation and decay. In this sense, questioning may be seen as an aspect of critical thinking which involves the process and general context of *learning*, the acquisition of knowledge and education. My analysis of questioning shows how its logic and functions provide a context which may encourage the epistemic virtue of the process of examining evidence as a basis for optimising the reasonableness of beliefs and how lack of such context may impede the process. Paradoxically the advantage and heuristic value of fallibilism as a grounding for the process of questioning with respect to critical thinking may be part of the problem and the negative attitude usually associated with questioning.

The relationship between questions and answers also creates an epistemic problem similar to Meno's paradox. If I ask a question seeking information, I should already 'know' (implicitly) or presuppose an answer. If I do not already 'know' (implicitly) an answer, I would not know if the answer that is provided is the correct one in order to accept it as satisfying my inquiry. I would not even ask the question if I did not already 'know' (implicitly) the correct answer I should accept. The notion of question thus seems to suggest that one somehow presupposes the answer or a plausible range or spectrum of alternatives, hence one questions to get something that falls into the spectrum, to validate what one knows. At the same time, if one does not already know what the information or spectrum is, one will not know what one is looking for because even if one finds it one will not recognise it as representing what one is looking for, since one does not 'know' it. However the logic of questioning in its open-ended process helps us to avoid this epistemic problem in Meno's paradox. The logic of questioning implies that nothing is absolutely known; assumptions are open to questioning and further exploration. By questioning the assumptions underlying questions and answers in an open-ended sense, we are able to clarify our ideas. When we ask a question, we do so within the contexts of our background beliefs, available evidence or knowledge, meta-beliefs and conceptual scheme. When we accept an answer, we do so tentatively within

these contexts as inference to the best explanation which could be questioned further given better evidence.

## Conclusion

I have analysed questioning to show its connection with fallibilistic epistemology as a basis to motivate critical thinking as a process of inquiry. By questioning texts, views, assumptions and beliefs, students may be able to learn the process of inquiry and acquire the ability and disposition of critical thinking. My analysis seems to lend credence to some commonplace views regarding how teaching and using the process of questioning could help students acquire critical thinking abilities. This requires that, (1) instructors motivate questioning by explaining to students its logic, functions and basis as an epistemic process—this may help to vitiate the negative attitudes and implications; (2) students have to see the connections among questioning, critical thinking, inquiry and learning, and fallibilism; (3) instructors have to develop a constructive and non-threatening way to ask questions and teach students a process of asking questions so that one does not alienate and intimidate; and (4) the instructor must create, in general, a classroom environment that will allow students to express themselves, and they must be given the opportunity to actively participate in their own learning process, which involves acquiring the skills of questioning for the purpose of bringing about understanding, growth and progress in knowledge.

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