How can critical thinking be used in the classroom

Critical thinking has been defined and re-defined by many scholars. However, looking at the breakdown of the term as the two words that comprise it provides a simple, yet accurate definition. The Critical Thinking process involves the use of the mind to incorporate prior experience and basic knowledge about a subject matter in order to reach conclusions. Critical thinking has a few definitions. In this article we are focused on what critical thinking looks like in the classroom. We are interested in how we can make more logical and accurate thinking a classroom habit that every school can adopt. To examine the topic of critical thinking we have to look beyond the purely philosophical perspective and explore the latest cognitive science. For example, we now know the importance that knowledge plays in developing critical thinking, you can't have one without the other. Expert thinking is a domain specific skill and the subject disciplines act as a catalyst for enhancing this life long skill. We also know the importance of retrieval practice in developing higher order thinking. Low stakes quizzing is not just rote learning, it plays an important part in freeing up our working memory to do more of the creative work. If we no longer have to strain to remember the facts and figures, our mental capacities can be put to work in more creative ways. Within the article we will also put forward some ideas about how to promote critical and creative thinking across your school. Critical thinking in the classroomCritical thinking is a process that is often viewed as a more intense version of just plain old thinking. In education, critical thinking is a disciplined process that has stuck around for a while now – but how is this coveted skill really different from just plain old thinking? Frankly, sometimes, it's not. The two terms can be used interchangeably, and often are. Consider a teacher who is urging a student “think harder” or “think differently”. What the teacher is actually saying is: “think critically in order to reach a more complex solution”. We are not always conscious of the multitude of cognitive actions at our disposal, the Universal Thinking Framework addresses this issue by providing child-friendly explanations of the various ways in which we can think. These can be chained together to create a logical inquiry that any student can follow. The idea being that over time, children begin to develop critical thinking dispositions that cause reflective thinking and advance the mental process. Increasing our repertoire of cognitive actions improves a students decision making process as they are simply more aware of the directions their learning could move in. ##We have divided the various types of thinking using these key questions:How do I get started?How should I organise my ideas?How do I know this?How can I communicate my understanding?What can I do with my new knowledge and understanding?All of the sections provide teachers with a systematic approach to encourage reflective thinking. The questions that are posed to the learner are designed to break down a complex process into basic skills. These thinking skills, over time can be mastered and understood. Having the different types of thinking available to both educators and students means that logical thinking can be achieved more readily and can eventually become an attitude of mind. The mental actions are accompanied by critical thinking questions. Teachers can use critical thinking questions to promote rational thinking. Reflective thinking is employed when a solution is needed, or in school when there is a connection that needs to be drawn between two or more concepts. Therefore, critical thinking is, in essence, the thought processes that result from disapproval of the solutions and connections that already exist, or a lack thereof.Developing academic arguments in the classroomCritical thinking skills vs dispositionsSchool leaders love to see and hear teachers incorporating the idea of crosscutting concepts into their daily instruction. That is, concepts and skills can be used and developed in more than one subject matter, and therefore more than one class. I don't think I have ever had an administrator who has not asked me how I plan to collaborate with my colleagues in order to make instruction more meaningful and applicable to my students' lives. Upon further consideration of this popular interview question, there should really only ever be one acceptable response to such a question – “I will make it a priority to routinely engage my students in the practice of critical thinking so that they can grow that skill and use it in other classes as well as outside of the school” … or something along those lines.It remains true that practice leads to confidence and increased ability. Therefore, as students learn what the process of thinking critically feels like for them, they will be able to replicate that feeling by replicating their actions in other classes. When critical thinking is used as a part of the daily routine, it becomes less scary to use that skill when faced with a problem, regardless of the subject matter. Critical thinking is, therefore, a crosscutting concept to be planned for and incorporated into a teacher's daily lesson plans as well as the scope and sequence of a course. If you want a practical way of integrating critical thinking into your lessons, our mental modelling approach using the building block method might be a good place to start. The playful approach encourages children to organise their ideas and in doing so, engage in critical reasoning.Critical thinking principlesDespite its value in all subjects, one uncertainty that educators run into is the idea of what Daniel T. Willingham (2019) calls transfer. That is, whether or not the ability to think critically in one subject or in relation to one problem will automatically lead to similar abilities in other subjects or problems. As Willingham (2019) explains, the research on this idea is not necessarily all in agreement. Consequently, educators are faced with a task that seems to be in flux and altogether unanswered. While frustrating, this is not necessarily a new ask for educators.Some scholars claim that the ability to think critically in one subject will naturally transfer to all other subjects, which is why it is so inherently valuable as a skill. Others argue that this is not the case, and that is why it is crucial to intentionally teach students how to think critically in all situations and across all subjects. With this quality still largely disagreed upon, it is difficult to know how best to proceed when attempting to teach and develop critical thinking skills. Do students ever possess a true foundation of critical thinking skills and abilities, or do they regress back to a point of utter confusion with the introduction to each new problem? How can educators make these skills stick for their students? What do students need to understand in order to be able approach problems from a critical thinking perspective regardless of the discipline or subject matter? How can we train students to recycle prior experience and previous solutions when faced with new problems?Argument with evidence using the Universal Thinking FrameworkAssessing vs. developing student thinking skillsCritical thinking is a high-level goal that educators everywhere strive toward for their students. Many “teacher moves” exist solely to work toward this purpose. However, repeatedly asking higher-order thinking questions in class and on tests, is merely the method that best demonstrates that the skill of thinking critically has already been developed. That is to say that just asking these types of questions as often as possible is not a sufficient method for the true development of this skill.When we ask higher-order thinking questions in class or on assessments, we are ultimately trying to analyze whether or not students have that ability; or to what level they have mastered that ability. However, it stands to reason that the only way to develop this skill cannot be to simply ask more of these types of questions more often, since this is just the method of measurement. So, the question now becomes - what are the steps that lead up to a student being able to successfully encounter and respond to these higher-order thinking questions that show their ability to think critically? The answer is actually quite simple– continue to teach and prioritize critical thinking skills in every possible situation, regardless of how many times it has been reviewed.What about critical thinking dispositions? It has been argued that this ability is not a distinct cognitive skill but a set of critical thinking dispositions or habits of mind. Ron Ritchart talks through the argument here.If your school is interested in implementing more critical thinking in your classrooms, you might want to start by sharing some key ideas with your staff. Our professional development approach gives staff access to the principles that underpinned critical thinking. We can help educators measure the impact of the interventions in the classroom.Monitor Critical Thinking Skills with the new frameworkHow can we develop critical thinking skills?Notice that in the answer above, the onus is placed on the educator rather than the student. There is not necessarily a numbered universal list of steps to take when given a critical thinking problem that we can give to students as a road map and post as an anchor chart in the classroom. Quite the opposite, educators are charged with the vague task of teaching students how to access prior knowledge and experience and apply it in a way that will benefit them. Ultimately, if students can manipulate their understanding and experience into a process and application that works for the task or question at hand, they are able to think critically. However, the ability to think critically in one situation does not predict with any real degree of certainty the same ability in a novel situation, especially one that seems more challenging to a student.One characteristic that tends to make students believe that one situation is more difficult than another is subject matter. Students are not able to generalize solutions that they have already thought through because the subject matter is so different. Willingham (2019) refers to this as the surface structure of a problem and gives the example of an inability to derive the solution for a medical problem even though it is essentially the same as the solution to military/tactical problem that the group had just worked through. However, since the surface structure of these problems seems so different, participants were not able to transfer the reasoning behind the solution to the tactical problem to the medical problem.Teachers see this difficulty with students all the time across subjects, which means that the real task for teachers to tackle is teaching students how to recognize the deep structure of a problem.Graphic organisers for developing critical thinkingAccording to Willingham (2019), strong critical thinkers claim that they are able to recognize the deep structure of problems presented to them in their field of expertise, but not necessarily in other fields. This is both comforting and disconcerting for teachers. It is comforting because it shows that it is normal for it to be a challenge for students to be able to transfer critical thinking skills from one problem to another. However, it is disconcerting because it seems nearly impossible for teachers to be able to overcome this barrier if experts still encounter this barrier regularly.All things considered, the seemingly realistic approach to the task of developing critical thinking skills in students through consistent practice seems to have a few clearly actionable approaches that are also memorable due to the alliteration they produce: collaboration, comparison and content knowledge. This form of knowledge is certainly important in everyday life. Using the new framework to promote critical thinkingCollaborative problem solving skillsCollaboration is the act of working with another person or other people in order to achieve a common goal or solve a common problem. In as many ways as possible, teachers should incorporate collaboration into their lessons. Initially, it may seem as though this practice takes away from the development of independent critical thinking since weaker thinkers can lean on stronger thinkers or just more dominant personalities. However, since subject-matter experts are easily able to identify the deep structure of problems within their area of expertise, it stands to reason that pairing experts together who excel in different areas and presenting them with a complex problem will yield the best results. Of course, in any given group of students, there may not be identifiable “experts”, however, the idea is that the different perspectives and experiences that students bring with them will intuitively lead them to a problem from different angles. This type of natural exposure to different approaches serves to model for students how it is possible to think differently about a similar problem. With continued modelling and wider exposure, students will gradually learn to intentionally incorporate different ways of thinking and to continue to seek out differing perspectives when searching for a solution to a problem.Logical thinking and careful thinking are often cited as being ways of thinking critically. The Cornell Critical Thinking Test and Watson Glaser Critical Thinking Appraisal both claim to be able to measure critical reasoning and critical thinking ability. Comparisons and critical thinkingWhile telling students what the deep structure of a problem is might seem fairly simple, the fact is that telling does not equate to teaching, nor does it always result in learning, especially when a skill is involved. Therefore, one way to begin to lead students to be able to identify and extract the deep structure of a problem is to have them compare. When asked to compare two (or more) problems with contrasting surface structures, students are forced to look harder for the similarities. While this may be met with resistance and frustration at first, when coupled with the practice of modelling these types of comparisons, students will begin to understand that there are similarities to be found after all, and how those comparisons can help lead to a practical and applicable solution.Developing reasoning skills using the blocksAcademic ArgumentsIdentification, construction, and evaluation of arguments are crucial parts of critical thinking.People often use the term "argument" to refer to a quarrel between people in everyday life. To a logician or critical thinker, an argument is not a statement, it is a collection of statements, with one being the conclusion and the rest being premise or assumption.The way students attain in subjects is by reading the views of the academic writing of others. The way students achieve in a formal exam setting is by writing the academic argument of their own. So without academic argument writing we cannot learn, or teach, or persuade. One way of promoting argumentation is by teaching students to create argument maps. This practical approach of developing an analysis of arguments means that students can visualise the main points in an easy-to-understand format. Domain Knowledge and critical thinkingSometimes, educators tend to avoid questions and practice activities that can be labelled as “basic recall” because they are said to be low in rigour. However, when attempting to develop critical thinking skills, it should be noted that domain knowledge expertise is achieved through extensive knowledge of the foundational aspects and facts of a topic. Willingham (2019) explains that effective critical thinking about a problem often comes from a place of confidence in the subject matter, which is born from extensive knowledge about it. Being able to see alternative viewpoints, argument with evidence (and spot bad arguments) and avoid faulty reasoning can become habits of mind that are nurtured throughout a students career. Additionally, sometimes a complex solution is merely the sum of many smaller and more routine solutions. There is value in teaching and focusing on content in school, as it breeds experts. When paired with the challenge of critical thinking in order to solve real-world problems, new interest can also be bred for a subject that students may previously have seen little use for.Critical thinking using the modelling blocksWhy is Critical Thinking Important?In a world where artificial intelligence is on the rise and continuously developing, a humanized value such as critical thinking is increasingly important. Reliance on technology makes life simpler in many ways, but simultaneously makes the possession of certain skills and abilities more attractive to potential employers and more beneficial for individuals who possess them. Critical thinking allows for creativity when problem-solving and promotes independence and confidence. Should technology ever fail, those who are able to think critically in a variety of situations will be the ones who are valued the most.Willingham, D. T. (2019). How to Teach Critical Thinking. Education: FutureFrontiers. ##

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