What tutors can do to enhance critical thinking skills through the use of Bloom's Taxonomy

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Learning is not compulsory… neither is survival.

W. Edwards Deming
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Abstract

Tutors can be the critical force who can encourage everyday learners to become critical thinking learners. Most of us are aware that there are various practices and pedagogies, designed to assist students to learn specific content at colleges and universities, but are they used? What are the processes tutors can use to encourage critical thinking?

According to Chaffee (2003), critical thinking is "Making sense of the world by carefully examining the thinking process, as well as to clarify and improve our understanding." Critical thinking is going beyond rote memory and multiple choice questions and encourages the <u>how</u> as well as the <u>why</u> forms of thinking.

Tutors can be the critical element that encourages this higher level thinking by the design and implementation of questions during tutoring sessions. Tutors can encourage the student to use a higher level of critical thinking and encourage the student to stretch cognitively. One method to accomplish this is to move the

student from just knowledge / remembering based interaction to a higher and critical thinking form of interaction. This article will outline Bloom's Taxonomy and provide the reader with methods as well as processes designed to encourage the student in becoming a critical thinker.

Introduction

In the early 1950's, following the 1948 American Psychological Association Conference, Bloom and others found that a large percentage of test questions were formatted requiring the student to use primarily recall, which is the lowest level of learning. Recognizing that there are different levels of thinking behaviors that are important to learning, Bloom, Englehart, Furst, Hill, and Krathwohl (1956), developed a classification of levels of intellectual behaviors. This taxonomy [classification] contains three domains: the cognitive, psychomotor and affective. The cognitive domain had six levels: knowledge, comprehension, application analysis, synthesis, and evaluation. Of the two domains recognized in the taxonomy, the affective domain has received less attention because it is less intuitive than the cognitive domain. According to Bloom, Krathwhol and Masia in (1964), this domain is concerned with value ranging from awareness [receiving], to being able to distinguish implicit values through analysis. The final domain is the Psychomotor, and Bloom and his team did not complete this study. As outlined by L. Schultz (2007), the original cognitive domains [which have nouns listed as their titles] are noted below (see figure 1).
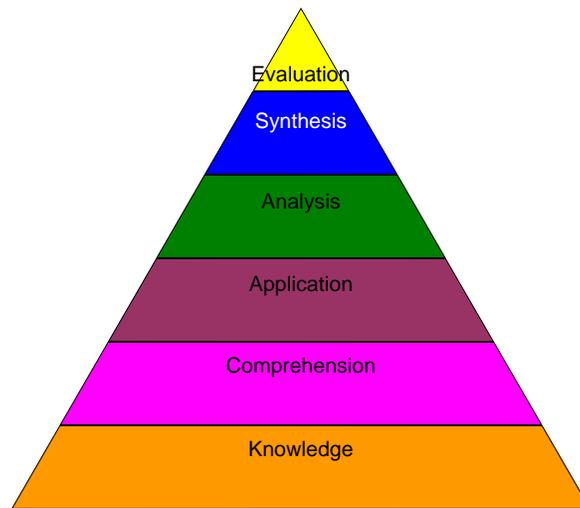
Figure 1

During the late 1990's, a new group of cognitive psychologists, lead by Anderson and Sosniak (1994), updated the taxonomy reflecting relevance to the 21st century. The comparison graphic (figure 2) represents new language associated with the Bloom's Taxonomy. The primary modifications were changing items from their original noun form to verb forms.
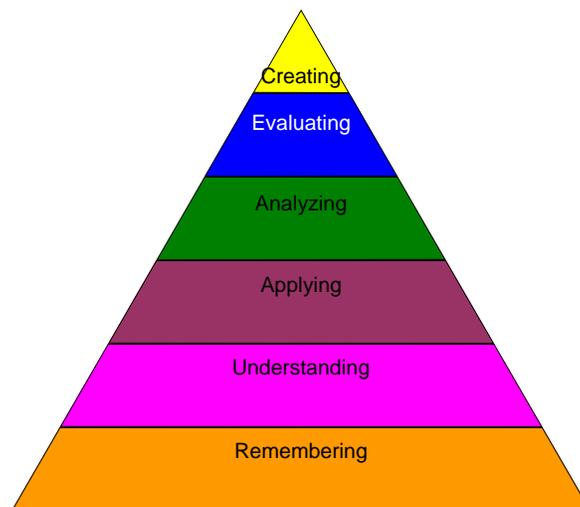

Figure 2

Although the three domains in Bloom's Taxonomy are interesting, this article will focus on the cognitive domain and its relationship to the enhancing critical thinking in students receiving tutoring.

The concept of critical thinking means many things to many people. In general, it contains the concept of thinking things through. For example, Hudgins and Edelman (1986, p. 333) define critical thinking as, "The disposition to provide evidence in support of one's conclusions and to request evidence from others before accepting their conclusions." Another definition by Beyer (1985, p. 276) defines Critical Thinking as, "The process of determining the authenticity, accuracy and worth of information or knowledge claims." I believe that critical thinking is a person having the abilities to differentiate and review opinions with non spurious evidence and to propose an opinion based on evidence of what is known. Whatever the accepted definition of critical thinking is, it is an important issue for academic, as well as future success. School and corporations alike are looking for college students who have the ability to communicate well, problem solve and are critical thinkers, regardless of their academic major.

Beyer (1985), went on to say that many educators believe that specific knowledge will not be as important to tomorrow's workers and citizens as the ability to learn and make sense of new information… critical thinking.

An overview of Bloom's Taxonomy – the Cognitive Domain
This taxonomy or classification of the cognitive domain or category is a multi-tiered model of classifying thinking according to six cognitive levels of complexity. The lowest three levels include: remembering, understanding, and applying. The highest three levels are: analyzing, evaluating, and creating. As noted earlier, the names of the domains have changed in the 1990's and as a result, there is some confusion on what to call each of the domains the old or new titles. What is important is that the function of the domains have remained relatively the same, therefore for the purpose of clarity, I will use the contemporary verb, followed by the parenthetical domain name that is a noun. The following is a general outline of the categories:

The first domain is Remembering [Knowledge], which is defined as the knowing of previously learned material or retrieving, recognizing, and recalling relevant knowledge from long-term memory. This may involve the recall of a wide range of material, from knowing common terms, specific facts, methods, procedures, basic concepts, and principles which can be used on a multiple choice examination.

It may also include terminology that may include specific facts such as people, places or things. When tutoring, tutors may wish to phrase questions that focus on recall. The Remembering Domain represents the lowest level of learning outcomes in the cognitive domain. Ways to access this domain is to use multiple-choice tests, ask the student to recount facts or statistics, ask for definitions or rules and quote a procedure.

The second domain is Understanding [Comprehension]. This domain involves being aware of the literal message contained in communication and being able to show a grasp of the relationships between each of these elements in your subject. The components of understanding include self-regulation, interpretation and extrapolation.

This may involve the use of self-regulation behavior that is best exemplified by restating the problem in the students' own words, making the information personal or modifying the information to something which is more meaningful, such as changing a step-by-step process into a flow diagram.

The third domain is Applying [Application] that refers to the ability to use learned material in a new or unprompted use of an abstraction. It is the use of a concept in a new situation or unprompted use of an abstraction. It is also includes applying what was learned to novel situation in another location. This may involve applying things such as rules, methods, concepts, principles, laws, and theories.

Analyzing [Analysis] is the <u>fourth</u> domain and can be described as the ability to examine a problem area in your subject and identify the various components [breaking the problem down] in order to better be able to focus attention on each. Analyzing distinguishes between facts and inferences and determines how the parts relate to one another and to an overall structure.

This may involve the ability to draw conclusions from data or from information that provides factual information. It may also include asking for an explanation or interpretation of meaning from a given statement.

Evaluating [Synthesis] is the <u>fifth</u> domain and refers to the ability to make judgments based on criteria or standards or to combine parts to form a new concept or idea. This domain may involve the ability to judge the value of material which can include statements, reports etc., for a specific purpose. The evaluation is based on definite criteria or relevance to the stated purpose.

The <u>sixth</u> and final domain is Creating [Evaluation]. This is the highest in the cognitive hierarchy because they contain elements of all the other categories, plus conscious value judgments based on clearly defined criteria. In this domain, there is an expectation that the person can correlate elements in order to form unique or functional whole. It may also include terminology that includes: judgements being made, the values, purpose, or ideas; solutions, as perhaps even methods.

This may involve creativity and may include writing a well-organized theme or giving a speech. It also integrates learning from different areas into a plan for solving a problem, or developing new classifying etc.

When one reviews all of the domains, it becomes apparent that the higher domains will often require one to show many of the lower sub-categories.

How to use Bloom's Taxonomy in the tutoring experience?

According to Raymond (2000), the zone of proximal development is the distance between what a student can do by themselves and the next learning that they can be helped to achieve with competent assistance [a tutor]. Knowing about the different levels of thinking can help a student to perform better critical thinking skills which can result in doing better on papers, tests, and other assignments. A tutor can pose questions to encourage a higher level of thinking rather than asking the student to regurgitate facts or the general recall of information.

Cruz (2004), created a unique method of combining the language of Bloom's Taxonomy along with illustrating learning objectives. Studying the definitions and verbs will assist with a basic foundation or introductory subject, however, it certainly will not be of much assistance when a student reaches upper levels and more demanding classes. Once students can incorporate the ability to analyze, synthesize, or evaluate the subject matter, there should be an increase in their grades resulting in enhanced academic retention and higher self-efficacy, as well as self-esteem.

One mechanism a tutor can use to encourage critical thinking is to use scaffolding. Vygotsky defined scaffolding as the "role of teachers [tutor] and others in supporting the learner's development and providing support structures to get to that next stage or level" (Raymond, 2000, p. 176).

There are various methods which can be used to enhance the critical thinking of tutees without an extra burden being placed on the tutor. Simultaneously, tutoring for content along with enhancing critical thinking skills is a very efficient use of time and effort. For example, the tutor does not have to answer every question the tutee asks. The tutor may wish to enlist the use of the Socratic Method, leading the student to the next logical step and appropriate conclusion. If possible, the tutor you should reflect the question back to the student or ask

them what they think. This process may result in a surprise response and perhaps the correct answer.

Using the information from Bloom as well as that of critical thinking, a tutor may present new information, rather than simply telling the tutee. A tutor should try asking questions and should develop a repertoire of questions that generate higher order thinking, such as the following: What do you already know about _____? Or what do you think is really going on?

The tutor should encourage specific responses and obtain the rationale for the students' opinion with questions that are structured to illicit a higher order response such as: What do you mean? Can you be more specific? What exactly do you mean by that?

Tutors can assist with the elimination of egocentric thought or the inability to view things from another's perspective by encouraging a student to see the problem, situation, or concept from a different viewpoint.

Tutors can assist students by observing how they problem solve. One way to do this is to ask them to talk through the problem by encouraging them to think out loud. When the student is in the process of analysis, ask them to develop questions of their own. Refer the student to one of the websites listed in this article as a resource and ask them to build simple questions.

Another method of encouraging students to function at a higher level to is have them analyze their own work and look for patterns in their thinking and in their mistakes.

Conclusion

Gluck said it best when he said that the learner of the 21st century needs to develop new skills and that the three Rs - reading. 'riting and 'rithmetic - are no

longer enough. We must add the three Cs - computing, critical thinking and capacity for change. (Gluck 1992 in Peters 1994 p 259).

The use of Bloom's Taxonomy can be a very powerful tool in assisting a student to learn at a higher and more critical level. This process does take the tutor a minimal amount of time to think about the phrasing of higher level questions, however, it is easy to integrate this with the content the tutor is delivering. If a tutor shifts from a content delivery based process to problem-based learning, the emphasis will move to a collaborative process and provide the student opportunities to develop the conceptual language of critical thinking.

The appendix of this article contains samples of questions for each of the domains which the tutor can integrate into their proverbial tool kit. There are also several websites which provide a wealth of information, as well as a unique format for questions which enhance cognitive growth and critical thinking.

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Appendix A

The following are examples that can be used to scaffold the student to the next level of critical thinking.

Remembering Domain

Questions a tutor can pose to enhance critical thinking skills include:
Define _____; What information is given?; What are you being asked to find?; Locate where _____ is; When did the event take place?; List the _____; and Name the _____.

Understanding Domain

Questions tutor can pose to enhance critical thinking skills include:

Explain the concept of _____; Give me an example of_____; Describe in your own words what _____ means; and What did it lead to _____?

Applying Domain

Questions tutor can pose to enhance critical thinking skills include: What would happen to you?; Is there a relationship between _____ and _____?; What would you have done when _____ happened?; and If you were there what would you have done?

Analyzing Domain

Questions tutor can pose to enhance critical thinking skills include:

Compare and contrast _____ to _____; What is important about _____?; What information supports your explanation?; and What other ways could _____ be interpreted?

Evaluating Domain

Questions tutor can pose to enhance critical thinking skills include: What changes would you make to improve _____?; Can you elaborate on _____?; and Can you provide an alternative to _____?

Creating Domain

Questions tutor can pose to enhance critical thinking skills include: Do you agree with _____?; What is your opinion of _____?;

How would you prove or disprove the following _____?; What data was used to make your conclusions _____?