

USING THE SOCRATIC METHOD AND BLOOM'S TAXONOMY OF THE COGNITIVE DOMAIN TO ENHANCE ONLINE DISCUSSION, CRITICAL THINKING, AND STUDENT LEARNING

T. Rick Whiteley
Calabash Educational Software,
drtrw@calabash.ca
University of Western Ontario
twhitele@uwo.ca
Ryerson University

ABSTRACT

The virtual world of learning is assuming its place in the field of education. While much of the literature in the area is of a descriptive nature, a need exists for the establishment of a theoretical and conceptual foundation to guide educators as they embrace this new approach to teaching and learning. Incorporating the Socratic Method and Bloom's Taxonomy of the cognitive domain to enhance online discussion, critical thinking, and student learning is one step in this direction. Some of the issues related to this area of inquiry are presented.

INTRODUCTION

Educational institutions have embraced the new technology of the Internet to deliver online courses in a format that more often serves as a substitute, rather than as a supplement, to the traditional "chalk and talk" in-class lecture format (Marvel, 1999). As greater experience with this new mode of delivery is obtained, there is a realization that the teaching approaches used in a *traditional classroom setting* (TCS) cannot effectively serve as mirror-image templates for the pure *virtual classroom setting* (VCS); changes are required.

The identification of theoretical constructs and relationships that are relevant to the area of a VCS is necessary in order to develop effective courses of this nature (cf. Piccoli, Ahmad, & Ives, 2001). Research in the area of e-learning needs to evolve beyond a general descriptive level, a focus all too common for new areas of inquiry, to a level that is based on sound pedagogical approaches appropriate for this new teaching and learning format, so that the desired learning objectives can be achieved.

While there is overall concern about how the online format compares with the traditional approach in terms of instructional performance (Marvel, 1999) and student learning (Newton, 2003), the new format has been specifically subject to criticism for failing to engage

students in critical thinking (Hay, Peltier, & Drago, 2004). Such criticism is also often levied against the traditional approach, but in the case of a VCS, the opportunity to engage students in this form of higher-order learning may be one of the more positive features of the online format.

Educational delivery formats have evolved from the traditional classroom setting to include correspondence courses, distance learning (mail, cable television, satellite, CDs, videotapes, etc.), and e-learning (Lau, 2000; Tham & Werner, 2005). Unlike correspondence courses and distance learning, e-learning has the opportunity, like that of a TCS, to include collaboration and interaction, so as to achieve a more intensive level of learning (Lau, 2000). It is this opportunity for interaction which must be exploited in a VCS.

The TCS reflects the *objectivist learning model*, where the knowledge is passed on to the learner by the course instructor (Piccoli, Ahmad, & Ives, 2001). In the *constructivist learning model*, the meaning of knowledge evolves (Piccoli, Ahmad, & Ives, 2001) through self-reflection or discussion. An instructor who directly answers a student's question, whether in a TCS or in a VCS is utilizing the objectivist model; an instructor who engages in synchronous or asynchronous discussion with a student, helping the student to fully understand a concept or topic is employing the constructivist model (Piccoli, Ahmad, & Ives, 2001). In the latter case, during the dialogue, by identifying areas of student weakness, the instructor can focus on these areas so that a more positive assessment of the student becomes possible (Rubash, 2004).

In a VCS, the instructor assumes the role of a content facilitator rather than the usual content provider or gatekeeper of knowledge common in a TCS (Bose, 2003; Goodyear, Salmon, Spector, Steeples, & Tickner, 2001; Parise, 2000; Smith, Ferguson, & Caris, 2001). The students in a VCS must assume a greater responsibility as proactive versus reactive learners (Pawan, 2003), because of the need to learn on their own (Boynton, 2002), given the absence of lectures. However, in a VCS, the role of the instructor as a discussion facilitator takes on greater importance than in a TCS, since, without the guidance normally provided through lectures,

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complete understanding and insight (Boynton, 2002; Hopper 2001) can only come about by the online direction provided by the course facilitator. For this reason, a VCS, serving more as the arena for an assignment-based versus a lecture-based course, needs to incorporate an intensive dialogue approach (Boynton, 2002) in order to ensure that the desired learning objectives, such as higher-order learning, are achieved. Class-level or student-level assignment submissions can serve as the points of focus for discussion.

In a TCS, students are often assigned the task of writing a paper on a topic, submitting it to the instructor, and then waiting for a grade to be assigned. Such an approach views the paper as a "dead product" (Barnett, 1993, p. 54). Seldom is there any extensive dialogue with respect to the submission between the instructor and the student or with the other students in the class. And if the student is required to present his or her paper before the class, any discussion by the instructor or other students tends to be very tempered, so as not to upset the presenter. However, the rules of the game seem to change when the submission is placed in the somewhat anonymous online environment. In such an environment, it is possible to bring the "product" alive by there being a virtual dialogue between the teacher and the learner(s) and/or between a particular learner and the other learners in the class. E-learning has been criticized for the lack of such interchange (Raatikainen, 2003). The proposed approach incorporating the Socratic approach and Bloom's Taxonomy of the cognitive domain to enhance online discussion, critical thinking, and student learning addresses this concern.

BLOOM'S TAXONOMY OF EDUCATIONAL OBJECTIVES: THE COGNITIVE DOMAIN

Bloom's taxonomy of educational objectives (cognitive domain) (Bloom, Englehart, Furst, Hill, & Krathwohl, 1956) has guided the pedagogical process for almost half a century. The taxonomy identifies six levels of learning through which a student can progress. The six levels, which can normally be considered to reflect a hierarchy (cf. Woolfolk, 1990), are *knowledge*, *comprehension*, *application*, *analysis*, *synthesis*, and *evaluation*. The *knowledge* level focuses on whether the learner can recall, recognize, or identify specific information (e.g., identify the four components of a marketing mix). The *comprehension* level focuses on whether the learner understands the meaning of a content area (e.g., explain the meaning of each component of the marketing mix). *Application* focuses on whether the learner can apply a content area (e.g., determine the breakeven point in units). *Analysis* focuses on whether the learner can see patterns in the material presented and can separate the material into its constituent parts (e.g., from a conceptual and theoretical perspective, explain the nature of the marketing mix reflected in the case study; identify the marketing problem in the case study). *Synthesis* focuses on whether the learner can establish new relationships (e.g., suggest alternative solutions to solve the identified problem in a case study). *Evaluation* focuses on

whether the learner can evaluate (access) alternatives or suggested relationships and arrive at an appropriate solution (decision) based on a reasoned assessment of the situation (i.e., recommend the best solution to the problem in the case study).

Knowledge, comprehension, and application are considered to reflect lower-order learning and analysis, synthesis, and evaluation are considered to reflect higher-order learning. Higher-order learning is much more difficult to achieve than lower-order learning, since higher-order learning reflects critical thinking, which requires one to go beyond just the basic facts, understanding, and application, and to use reasoned thinking to gain the insight required to deal with the situation at hand. Because of this greater difficulty, the role of the teacher, or learning facilitator, is more important. The learning facilitator can use his or her knowledge and insight to help the student, in a step-by-step fashion, to acquire a higher level of understanding. The application of the Socratic Method is one approach which can be used to achieve this educational objective.

THE SOCRATIC METHOD

Socrates developed the philosophic method referred to as the method of *dialectic*, which has come to be known as the *Socratic Method* [or the *Elenchus* (Lavine, 1984)], an approach by which one seeks the truth via a process of questions and answers (Magee, 2001). Dialectic means discussion (Lee, 1987, in Plato, 375 BC/2003). The basic approach is to first present a general question, often in the form of a "What is . . . ?" question, to which the interlocutor (i.e., the participant in the dialogue) replies (e.g., gives a definition), and to which the questioner might respond by indicating that the interlocutor's answer is inadequate [i.e., "too narrow, too restricted, or is biased or uninformed", Lavine, 1984, p. 22] (Lavine, 1984). Through this process of dialogue, the initial response (e.g., definition) is destroyed (i.e., shown to be inadequate), requiring further thought and analysis by the interlocutor, and then leading to the submission of a new response (Lavine, 1984) by the interlocutor. The questioning continues, often using the "technique of counterexample" (i.e., considering additional examples, cases, and/or particulars) (Lavine, 1984, p. 23), ultimately seeking to obtain an adequate response, if possible.

The Socratic approach is used to get one to re-examine what they believe; it is not an approach used to present absolute information (Magee, 2001). In the area of pedagogy, the Socratic Method requires the teacher to empathize with the student by understanding the problems faced by the student during the learning process and to gradually guide the student to a proper understanding of the subject area (cf. Magee, 2001). During this process of learning, it is even appropriate to attempt to "trip up" interlocutors, as did Socrates (Magee, 2001), to further test the learner's understanding of the issue.

For one to become a dialectician, one needs to understand the "nature of each thing" (Plato, 375 BC/2003, p. 266). It is through the dialectic method, based on reason, that one gains this understanding (Plato, 375 BC/2003, p. 264), and it is also through this method that assumptions are destroyed (Plato, 375 BC/2003, p. 265). From Plato's perspective, the line of understanding goes

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from pure knowledge, to reason, to belief, and finally to illusion. Belief and illusion combine to reflect opinion, which, in turn, represents a "world of becoming" (Plato, 375 BC/2003, p. 266). Pure knowledge (thought) and reason combine to reflect knowledge, which, in turn, represents "reality" (Plato, 375 BC/2003, p. 266), or the "intelligible realm" (Plato, 375 BC/2003, p. 404). And it is with respect to the intelligible realm that there is greater reliability than there is with the realm of change (Plato, 375 BC/2003, p. 404). Overall, Plato's concern dealt with the reliability of the different methods of perception (Plato, 375 BC/2003, p. 404), with reason being the link between pure knowledge and opinion (Plato, 375 BC/2003, p. 265).

Underlying the dialectic method is "disciplined, rigorously thoughtful dialogue" (Merritts & Walter, n.d.). In an educational setting, even though the instructor knows the subject area, the approach taken is to "feign ignorance" (Merritts & Walter, n.d.) with respect to the subject area. The role of the instructor is to guide the student along the correct path, correcting misconceptions, incomplete and inaccurate positions along the journey, and eventually, hopefully, having the student achieve a more accurate understanding of the matter under discussion (Merritts & Walter, n.d.). And since the Socratic Method is an approach that is designed to engage the student in critical thinking and in the process of reflective thinking (i.e., to examine one's own thought processes) (Merritts & Walter, n.d.), it requires a facilitator who is actually knowledgeable on the topic of discussion, thereby ensuring that the questions posed will be more "meaningful than those of a novice" (Merritts & Walter, n.d.).

One of Plato's concern in the area of the education of the philosopher was that "if one's starting point is something unknown, and one's conclusion and intermediate steps are made up of unknowns also, how can the resulting consistency ever by any manner of means become knowledge" (Plato, 375 BC/2003, p. 265). A student who is new to a subject area faces this type of situation. However, through the dialectic method, the goal is to enable the interlocutor to respond to questions at the highest level of understanding (Plato, 375 BC/2003, p. 267). The dialectic is considered to be the "coping-stone" of the educational system (Plato, 375 BC/2003, p. 267): it provides the "finishing touch" for the process of learning. The pedagogical foundation for this journey is the movement through the levels of learning comprising Bloom's Taxonomy.

From the perspective of learning, one of the positive features of the Socratic approach is that, "in an intellectually open, safe, and demanding learning environment, students will be challenged, yet comfortable in answering questions honestly and fully in front of their peers" (Merritts & Walter, n.d.). While such comfort may not exist in all TCS situations because of the lack of anonymity, in a VCS, where anonymity generally does exist, the student should be more at ease during any dialogue.

Merritts and Walter (n.d.) offer a number of guidelines (or tips) for teachers who decide to implement the Socratic Method in a TCS. Specifically, Merritts and Walter suggest the following guidelines: (1) plan ahead by having significant questions ready so as to provide structure and direction during the discussion; (2) make sure the questions are phrased clearly and specifically; (3)

allow the student 5-10 seconds to respond to the question; (4) keep the discussion focused; (5) follow up on student responses and seek elaboration, (6) engage the student in a stimulating discussion by asking probing questions; (7) present a summary of the points discussed; (8) engage as many students as possible in the discussion; (9) promote critical thinking by avoiding questions that only require a "yes/no" answer; and (10) avoid questions that are vague, ambiguous, or too advanced for the student participant. The student's role during this process is to be focused and to the point (Merritts & Walter, n.d.). Whether it is in a TCS or a VCS, a major difficulty for learners is to be focused and to the point, so it is up to the course instructor to guide the students in this direction.

While most of these guidelines would also apply to a VCS, some adjustments are required. The appropriate questions to ask depend on the nature of the assignment and the directional flow taken by the sequence of questioning and responses. Such questions can focus on a general aspect of the course material, seek to encourage creativity or brainstorming, or focus on a specific problem. Specifically, the questions can seek clarification, probe assumptions, probe reasons and evidence, or probe implications and consequences (Merritts & Walter, n.d.). The nature of the questioning would be the same in both a TCS and a VCS.

A major difference between the two learning modes is that the time allowed for a student, and the instructor, to respond is less controllable in an asynchronous VCS. In a TCS and a synchronous VCS, the student is expected to respond relatively quickly; in an asynchronous VCS, sufficient time must be provided to allow a student to log onto the system, and then respond. This time lag makes it a little more difficult to keep the student focused, since corrective measures cannot be taken until the next time the course instructor also logs on.

As for the other guidelines, response follow-up and requests for elaboration are also subject to this time delay. The intensity of a stimulating discussion by asking probing questions in a TCS becomes self-evident, but in a VCS, the time lag would temper the level of intensity. Trying to involve as many students as possible in an asynchronous dialogue is also hindered by the temporal separation; there is no control over who is to respond, or when. The issue of promoting critical thinking by requiring responses more detailed than just of a "yes/no" nature is achievable, but this matter also faces the same problem of temporal separation; the course instructor cannot immediately request greater depth of analysis when such a simple response is delivered. Finally, the course instructor must wait for the student to respond if the latter considers a question to be vague, ambiguous, or too advanced. The lack of visual cues makes it more difficult in an asynchronous online course to determine if a student does not understand a question. However, in a TCS, the instructor can visually determine the student's reaction to a question (e.g., looks perplexed); and in a synchronous VCS, the student can immediately request clarification. The only way for the online instructor to determine if a student does not understand a question in the absence of a direct statement of this nature by the student is to examine the student response. The questioning

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strategy is designed to help the student move along the path of learning and to avoid such situations.

THE SOCRATIC METHOD QUESTIONING STRATEGY

The questioning strategy is the foundation of the Socratic approach. Whatever the issue at hand happens to be (e.g., a case study, a newspaper article, an actual market event), under this approach, the student is asked a series of questions about the situation or about how the student has responded. The questions can focus on the student's knowledge (e.g., What marketing theory is illustrated by a particular fact?), comprehension (e.g., Why would sales be falling if prices were increased?), or the ability to apply a particular technique (e.g., breakeven analysis). The questions could also deal with determining the relationships among the identified marketing theories and concepts, the symptoms to the problem, and the actual problem itself (analysis); with determining the possible ways by which to deal with the problem identified; and finally, with determining the best solution to the problem at hand (evaluation).

An important role of the instructor during the questioning period is to determine how best to deal with situations when the student is unable to respond, has made an incorrect response, or is on the wrong track, a common problem in case analysis. The approach of telling the student to return to the literature to find the answer may or may not be an effective approach. Twibell, Ryan, and Hermiz (2005) found that using the self-discovery approach did not have universal support from instructors. However, it really depends on the issue at hand. If it is something that is easily found, without further guidance, such self-discovery would be beneficial to the student, rather than spoon-feeding the answers to the student. On the other hand, if the issue is a little more complex and such a directive would only lead to frustration on the part of the student (e.g., go find something I lost in the ocean), then rephrasing the question or presenting a series of simpler questions would probably be more productive (cf. Twibell, Ryan, & Hermiz, 2005).

The ultimate goal of the questioning strategy is to ensure that the student fully and correctly understands the situation under investigation. As the student begins to swerve off course or hits a brick wall, the role of the instructor is to direct the student in the right direction, but without providing the answers. The role of the instructor is to assess the situation and then to determine how best to "talk" the student through the learning process (cf. Shelton, 2000). This approach essentially reflects what is referred to as *scaffolding*, where the teacher provides a certain degree of assistance to guide the student, so that the student eventually gains meaning and is able to construct his or her own knowledge, independently (Oliver, 1999).

Instead of starting with more detailed questions, and then developing more probing questions built on a particular response, it is often best for the course instructor to initially use a series of multiple-choice questions based on the topic under investigation (e.g., case study). If the student provides an incorrect response, the instructor should then return to the original question, set things

straight, and then move forward (cf. Merritts & Walter, n.d.). Of course, the time issue, once again, becomes a major concern.

The multiple-question approach underlying the Socratic Method may begin to upset the student, because of the long series of questions (cf. Twibell, Ryan, Hermiz, 2005), and some students just do not want to engage in such an analysis (Boynton, 2002). However, continual encouragement of the student's successful progress, and even indicating that the task is almost complete, should make the student feel more at ease, knowing that the light at the end of the tunnel is now visible. An instructor in the study by Twibell, Ryan, and Hermiz (2005) reported that, after going through such a battery of questions, most students indicated that their understanding with respect to the issue at hand had increased and that they then realized that all of the questioning made sense. While it is recommended that a course taken in a VCS should not be more rigorous than one taken in a TCS (Institute for Higher Education Policy, April, 2000, May, 2001, as cited in Boynton, 2002), the opportunity to foster greater learning in a VCS environment using the Socratic Method should not be overlooked. Similar benefits might also be realized by incorporating such an online component in a TCS.

In some ways, a VCS is better suited for the *deep learning* underlying the use of the Socratic Method than is a TCS. Nonetheless, while such learning can be fostered in the learning environment of a VCS, deep learning is also possible in a TCS, but, as previously indicated, the latter environment is constrained by the limit of time (Bredon, 1999). The other problem is that the ephemeral nature of a TCS makes it difficult to remember what was said. While both *reflection-in-action* and *reflection-on-action* (Schon, 1988) are possible in both a TCS and a VCS, the presence of a text-based, digital record of the dialogue in a VCS makes it easier to engage in reflection-in-action, since the time dimension is controlled by the respondent in the dialogue. Reflection-on-action entails reflecting on a teaching/learning activity after its conclusion; reflection-in-action entails reflecting on a teaching/learning activity as it is happening (Stanley, 1998). In the latter case, the instructor can redirect or adjust the instructor-learner dialogue as it continues, synchronously or asynchronously, to achieve the desired pedagogical goals. The research by Hay, Peltier, and Drago (2004) indicates that the development of reflective thinking was just as effective in an online management course as it was in a traditional course.

Throughout the application of the Socratic Method, the course facilitator needs to be aware of the level of learning that is relevant. Since the Socratic approach focuses on the area of critical thinking, it is, thus, an approach that can effectively be used to help students to achieve the higher-order learning level of Bloom's Taxonomy of the cognitive domain (i.e., analysis, synthesis, and evaluation). Application of the Socratic Method can also focus on lower-order learning as set out in Bloom's Taxonomy (i.e., knowledge, comprehension, application), but such an approach should only be employed if problems exist in helping the student achieve higher-order learning. Querying a student about his knowledge, comprehension, and application skills is more efficiently addressed through other, less intensive and less time-consuming approaches (e.g., online test).

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CONCLUSION

Incorporating the Socratic approach as part of a VCS in order to develop the critical thinking skills of students reflects the use of an instructional strategy that seeks to provide a sound pedagogical foundation or model in such an environment, something which is considered lacking in the online setting (Cifuentes & Shih, 2001; Firdywek, 1999, Hopper, 2001). It also meets the need for a paradigm shift (Hopper, 2001) in terms of the approach to teaching and learning in a VCS. Such an approach is perhaps more easily implemented in a VCS than it is in a TCS, since students would be more at ease participating in an environment that is free from the "direct gazing eyes" of the other class members. It also overcomes the concern with respect to the measures used to assess participation: The assessment process can focus not only on the quantity of dialogue but on the quality of the dialogue, as well (cf. Hopper, 2001), because of the opportunity to review the recorded, text-based digital dialogue. And even though the dialogue in a VCS based on the Socratic approach is of a direct nature between the teacher and the learner(s) and/or between a particular learner and the other learners in the class, the entire VCS community is privy to all of the dialogue, just as it is in a TCS. However, because of the intensity of such dialogue and the need to directly enter text-based responses, the time commitment required to carry out this interactive process is significantly higher in a VCS.

While the focus has been on incorporating the Socratic Method in a VCS, the approach can also be used in a hybrid TCS-VCS course. Using this method in the VCS component of such a course will foster the achievement of the positive benefits of the approach. In this way, a VCS can serve in a support role in a TCS, a role recommended by Hopper (2001). Such a hybrid approach may, in fact, increase the effectiveness of a TCS (Bose, 2003; Raatikainen, 2003).

The need to recognize that an online course incorporates both content and process (Bose, 2003), with a paradigm shift being required in the area of process, is essential. Even under a hybrid approach, not all students will achieve a level of excellence; there will be student variability in performance (see Bose, 2003), for whatever reason. However, Gregory (2003) found that, when a course included at least some synchronous component, student feelings toward the quality of the communication and the overall effectiveness of the course instructor were more positive.

Through the application of the proposed approach to teaching and learning, students have the opportunity to become independent thinkers through the assistance of the online facilitator (or mentor) in a virtual environment which is primarily text-based (cf. Vygotsky, 1978, as cited in Cifuentes & Shih, 2001). Overall, combining the Socratic approach with the process of critical thinking is one way by which to address the concern of those about the quality (Porter, 2004) of online courses. It is also a means by which to recognize the existence of different learning styles (Porter, 2004), and to accommodate these differences. The ultimate question is not whether learning can be achieved in an online environment, but, rather, how best can learning be

achieved in such an environment (Salter, 2003). The technology used should be assessed in terms of its instructional value versus just capability (Sand & Schoenfelder, 1998, as cited in Raisingham, Chowdhury, Colquitt, Reyes, et al., 2005). It may be that the technology employed in a VCS can play an important role in the area of discussion (Piccoli, Ahmad, & Ives, 2001). It may also be that the best approach is to use a hybrid or blended learning approach with utilizes both the positive features of a VCS and the positive features of a TCS (Duhaney, 2004); unfortunately, this is not possible if the students in a VCS are geographically dispersed. A blended learning approach, however, may be most appropriate when faced with diverse learning styles (Dennis, 2002, Duhaney, 2004).

The issue of temporal separation is one of the major stumbling blocks of online learning. Both the instructor and the student can lose focus because of the time gaps between responses. In a TCS and a synchronous VCS, discussion is, for the most part, linear; however, in an asynchronous VCS, particularly, when many participants are engaged in a dialogue, the multi-dimensional nature of the discussion becomes apparent. Because of the time delays and the multiple points of entry, it is often difficult for all parties concerned to follow the sequence of discussion and to remain focused. This problem has a lot to do with the nature of the online technology; following the threads of the discussion entries is a near impossible task when the numbers increase. When the dialogue is solely between two parties (e.g., instructor and student), this problem is significantly minimized. Unfortunately, in the later dyadic dialogue, the other members of the learning community can only assume the role of spectators.

The virtual learning environment is assuming its role in the field of pedagogy. It is here to stay. As educators gain more experience with this new approach to teaching and learning, so too will their understanding of the best pedagogical approaches to use to achieve the desired learning outcomes. The pioneers in the field of education based on the traditional classroom setting had to embark on a similar journey.

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