

# Enhancing Student's Higher Order Thinking Skills (HOTS) through the Socratic Method Approach with Technology

Salihuddin Md Suhadi<sup>1</sup>, Hasnah Mohamed<sup>2</sup>, Zaleha Abdullah<sup>3</sup>, Norasykin Mohd Zaid<sup>4</sup>, Baharuddin Aris<sup>5</sup>,  
Mageswaran a/l Sanmugam<sup>6</sup>  
Department of Educational Science, Mathematics and Creative Multimedia, Faculty of Education,  
Universiti Teknologi Malaysia  
Salihuddin82@gmail.com<sup>1</sup>, hasnah-m@utm.my<sup>3</sup>, zac@utm.my<sup>4</sup>, norasykin@utm.my<sup>2</sup>, bba@utm.my<sup>5</sup>,  
aran9600@gmail.com

\* corresponding author: salihuddin82@gmail.com

## Abstract

Technologies have a potential to make learning more dynamic and capable of going beyond traditional learning boundaries. With the use of online technologies for example, students can interact with teachers and other students, regardless of time and distance. The learning process can also occur in synchronize or asynchronies. Meaningful interaction is needed in the Socratic method of learning because this is the concept of learning through question after question to build knowledge. The dialogue interaction, questions are either verbal or non-verbal. So this is where online technology comes into allows students to always dialogue with certain individuals to construct new knowledge. Next, by using the Socratic method of learning the high level of HOTS can be increased which is emphasized in the field of education in Malaysia nowadays. This paper will discuss previous studies about the potential of technology in engineering methods to improve student's HOTS.

**Keywords.** Socratic Learning Method; Enhance HOTS; Technology in Education

## 1. Introduction

Technology nowadays can assist and support the activities of teaching and learning in order to make it more interesting and meaningful [1] [2]. In Reference to the Malaysia Education Blueprint (MEB) (2013-2025), Higher Order Thinking Skills (HOTS) is an element that is emphasized. In order to achieve it, a learning method suitable for implementation to attract students and increase student involvement, understanding and to enable students to adapt the content of the lessons that have been learned. An appropriate learning methods used in improving the HOTS is the Socratic Learning Method. This was supported by [3] in his book states that this method can build a HOTS. When the student has mastered the content of the lesson, they will be able to diversify methods for finding the solution of a problem in line with the requirements of HOTS. Therefore, the role of technology in achieving the learning method is greatly needed because according to [4], the learning environment will be even more fun and interesting with the use of technology.

## 2. Higher Order Thinking Skill (HOTS)

Higher Order Thinking Skills (HOTS) is an agenda for improving education in Malaysia. HOTS involves elements such as critical thinking skills, logical, metacognitive and creative. This idea by itself is triggered when a person is faced with rare problems, trying to solve difficult problems and experiencing dilemmas [5]. HOTS also involve higher cognitive skills adaptation of Bloom's Taxonomy as reported by [6], namely the skills to analyze, synthesize, evaluate and produce a new idea [7]. HOTS has 5 key elements to be implemented in the classroom, namely (i) reasoning, (ii) Inquiry, (iii) questioning techniques, (iv) Creativity and (v) solution of the problem. The third element of questioning is a very important technique for building HOTS students, this Learning Socratic Method is suitable as an approach in this study [8].

### 3. Socratic Learning Method

One method that is often used in the Socratic learning is dialogue. The purpose of dialogue is to discuss a problem to find a solution which various learning more towards independent learning [9]. Usually dialogue is the interaction between two individuals, but when learning occurs in the classroom, teachers change the dialog interaction in groups. The teacher's role is to be a facilitator for the group and ensure that the group is always in dialogue with debating until all the setbacks can be solved [10]. All the arguments raised by the constructs will synthesized to achieve an optimal solution. The same concept also exists in the Socratic Seminar (similar with Socratic Method), a series of questioning techniques with answers that logic to construct an argument and conclusion. This technique will stimulate the thought as to think more critically [11].

### 4. Using Technology to enhance learning

Learning Environment of Socratic method can involve the use of technology in view of the present era of technology boom [12]. The purpose of technology is to make the students more motivated to engage in learning [13]. The involvement of students in teaching and learning (TnL) is a very important matter to be taken into account. If the student involvement is not satisfactory, indirectly the objective TnL can not be achieved with either. Therefore, when the engineering a learning environment methods that can be implemented online, students can engage simultaneously (together) as compared to the normal learning environment that is held by rotation. Even the learning environment will become more attractive and can also encourage students to give an opinion without constraints [14].

### 5. Discusion and Conclusion

Based on the description above, it clearly shows the importance of technology in education is increasingly becoming a priority to encourage, stimulate and motivate students while learning method itself. With the use of technology, the learning process can be done more easily by teachers, particularly to monitor, respond and deliver whatever the latest information to students. However, learning is more dominant in conveying concepts, while technology is a medium that helps to realize that learning. Compared to previous studies, Socratic methods applied face to face and this study aims to combine Socratic Methods with technology so that learning can be implemented online.

### 6. References

- [1] R. A. Schwier, "The Next Generation of Distance Education," pp. 139–156, 2012.
- [2] P. Dillenbourg and J. Sanna, "The Evolution of Research on Computer-Supported Collaborative Learning," *Technol. Learn.*, pp. 3–19, 2009.
- [3] S. D. Chesters, *The Socratic Classroom*, 1 st. Rotterdam, Netherlands: Sense Publishers, 2012, pp. 1–5.
- [4] J. van Bruggen, *Theory and practice of online learning*, vol. 36, no. 1. 2005, pp. 111–112.
- [5] F. King, L. Goodson, and F. Rohani, *Higher Order Thinking Skills ; Definition, Teaching Strategies and Assessment*. Educational Services Program.
- [6] D. R. Krathwohl, "A Revision of Bloom ' s Taxonomy ;," *Theory Pract.*, vol. 41, no. June 2014, pp. 37–41, 2010.

- [7] L. A. Tomei, *Taxonomy For The Technology Domain*. Hershey: Information Science Publishing, 2005.
- [8] Y.-T. C. Yang, T. J. Newby, and R. L. Bill, "Using Socratic Questioning to Promote Critical Thinking Skills Through Asynchronous Discussion Forums in Distance Learning Environments," *Am. J. Distance Educ.*, vol. 19, no. 3, pp. 163–181, Sep. 2005.
- [9] D. Birnbacher and D. Krohn, *Socratic dialogue and self-directed learning*. In R. Saran, & B. Neisser (Eds.) *Enquiring minds: Socratic dialogue in education*. Stoke-on-Trent, UK: Trentham Books, 2004.
- [10] J. B. Tikva, "Socratic teaching is not teaching, but direct transmission is: Notes from 13 to 15-year olds' conceptions of teaching," *Teach. Teach. Educ.*, vol. 26, no. 3, pp. 656–664, Apr. 2010.
- [11] J. Shea, "Socratic Seminars encourage metacognition and critical thinking in Grade 8 students," *Res. Gate*, pp. 1–14, 1997.
- [12] N. Srisawasdi and P. Panjaburee, "Technology-enhanced Learning in Science, Technology, and Mathematics Education: Results on Supporting Student Learning," *Procedia - Soc. Behav. Sci.*, vol. 116, pp. 946–950, Feb. 2014.
- [13] M. Granito and E. Chernobilsky, "The Effect of Technology on a Student 's Motivation and Knowledge Retention," *NERA Conf. Proc. 2012*, no. 17, 2012.
- [14] T. Anderson and F. Elloumi, *Theory and Practice of Online Learning*. Alberta, Canada: Creative Commons, 2004, pp. 1–26.