Review Article

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International Journal of Rehabilitation and Special Education

Year 2024, Volume-4, Issue-1 (Apr)

DOI: 10.48165/ijrse.2023.4.1.4

ISSN 2583-133X (Online)

Submarine Teaching Model for High Order Thinking Skills Application

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ARTICLE INFO

Key word: Submarine Teaching Model; Critical Thinking Skills, High Order Thinking Skills Education Centre Lecturers

ABSTRACT

The lecturers at the Education Centre of University Utara Malaysia (UUM) were introduced to the importance of higher-order thinking skills in cultivating future human resources through the submarine model. This study aims to determine if students demonstrate higher-order thinking skills and if the Submarine Teaching Model (STM) is suitable for educational purposes. Education Centre teachers often perceive education students to possess a high level of intelligence, as evidenced by the Submarine teaching methodology. Students with exceptional critical thinking skills sometimes need more attention due to academic shortcomings. The study utilises the STM to supplement the theories of constructivism and behaviourism. It comprises both intrinsic and extrinsic cognitive abilities. Ten Education Centre lecturers were designated to respond to the research questions. The relevance of STM was assessed using semi-structured interviews utilising normative-descriptive instruments. These instruments utilised questionnaire methodology and usability assessment models as references. The study was conducted by submitting seven questions and engaging in conversations using Google Forms and WebEx. The study's findings indicate that Education Centre lecturers possess a comprehensive understanding of the student's higher-order thinking skills and capacities as depicted in this model and effectively incorporate these into their teaching practices.

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Received 05-08-23; Accepted 29-11-23
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Introduction

Lecturers have a significant role in facilitating teaching and learning within the classroom (Mishra & Mehta, 2017). Most lecturers at the Education Centre increase their students' intellectual skills when teaching and studying in the school. The Education Centre lecturers provide pedagogical information to the education students under the teaching curriculum. By executing prescribed assignments, students actively engage with and internalise the knowledge imparted by the lecturers. Lecturers consistently prioritise and spontaneously acknowledge students' presenting abilities without considering their underlying qualities.

The acts of these professors can undermine the performance of their pupils. By analysing exam results or classroom input, educators deduce that education students lack comprehension of exam questions, demonstrate an inability to provide justifications, and display immaturity. Students' behaviour and academic achievements indicate their potential to become valued human resources. Wu, Hu, and Wang (2019) argue that lecturers have a crucial role in educating students to prevent them from dropping out of school and giving up on their future.

The Submarine Model categorises talents into two types: visible skills, which are observable by lecturers, and intangible skills, which are latent. By utilising this model approach, educators at the Education Centre can understand and assist proficient students, allowing them to grow into valuable human resources. The phenomenon will transform as time progresses. This study aimed to determine if lecturers could utilise the tangible and conceptual skills inherent in the submarine model, per constructivist education theory principles (McBrien & Brandt, 1997). Furthermore, the Universiti Utara Malaysian Education Centre lecturers can assess the submarine model's practical suitability.

The problem statements

Particular lecturers evaluate students' intellectual capacity by analysing their aptitude in problem-solving, evaluating, analysing, synthesising, and their level of maturity in constructing arguments. These assumptions resulted in the neglect of these pupils by teachers who saw them as intellectually inadequate. Berland et al. (2013) show that students exhibit sporadic interest in and comprehend the topics yet need distinct proficiencies in practical situations.

Despite the existence of a mentorship programme, most instructors need more time to interact with students due to their extensive obligations to the institution. Consequently, many professors disregard trivial abilities in students since they need to see the hidden potential in education students despite their academic weaknesses.

As to UNESCO's 2030 agenda, students must enhance their higher-order cognitive skills and capabilities to become productive members of their country (United Nations Educational, Scientific, and Cultural Organisation, 2016). Kwek (2011) argues that using higher-order thinking skills in the classroom may not always provide advantages since it is contingent upon the student's existing knowledge and cognitive abilities. Classroom teaching strategies can enable lecturers to manage students with diverse skill levels effectively (Rossi de Campos, 2015). The study aims to determine if professors at the Education Centre of the University of Utara Malaysia have a comprehensive understanding of the physical and intangible competencies encompassed in the submarine model and whether this model is appropriate for implementation by the said lecturers.

Implementing a pedagogical framework guarantees that organisation and guidance assist students in achieving diverse, tangible goals. This study utilises a submarine model grounded on two major theories: constructivism and behaviourism. Every student possesses unique abilities that require the guidance and support of their instructors to grow. The education students at UUM have a heterogeneous background and many achievements. While they have been chosen for the education programme, their exam results occasionally meet the minimum requirements. In their study, Scheer et al. (2015) identified three key variables that lecturers should consider: student engagement, the range of experiences, and students' self-competence. Self-competence refers to the crucial skills that students require to integrate their learning and talents and effectively use higher-order thinking skills.

As Baran (2010) outlined, the ASSURE teaching model guides educators in identifying students' intangible skills and facilitating their application at a higher level for future employment. Adam (2020) also highlights that each student contains inherent abilities that may only be identifiable once they get assistance in requalification, enhancement, and the development of future competencies. According to Markowitsch & Plaimauer (2009), reskilling, upskilling, pragmatic skill acquisition, and hybrid skill development can all help students develop proficient human resources. However, the effectiveness of these approaches depends on the teaching methods employed by the lecturer.

Submarine Teaching Model

The Submarine Model (Figure 1) is designed to demonstrate that students possess a range of advanced cognitive

skills necessary for future success. During teaching and learning, lecturers have the knowledge and skills to assess students' ability to engage in critical thinking and uncover their latent potential. Additionally, they can incorporate students' technology and cognitive framework into their personal growth.

The activities of lecturers to support education students in obtaining new information and behavioural skills are not simply determined by educational achievements. The Submarine Model, proposed by Mohan & Arumugam (2021), emphasises the importance for educators to distinguish between students' critical thinking habits and the essential higher-order thinking skills that students possess. According to Dewey & Dewey (1915), the lecture course is ideal for enhancing students' cognitive abilities by familiarising them with the intricacies of intricate situations, thereby expanding their understanding of social knowledge. Dewey posits that latent skills in kids have the potential to revolutionise the world via their comprehension of active problem-solving.

As proposed by Dewey, the submarine teaching approach instructs Education Centre lecturers to focus not only on present classroom actions but also on students' inherent abilities. It is also essential to cultivate their cognitive capacities to foster their potential as valuable human resources in the future. Lecturers must discern between pupils' cognitive processes and their inherent abilities or proficiencies. Therefore, the submarine teaching style empowers instructors to assist students in enhancing their higher-order thinking abilities and current capabilities by incorporating advanced technology knowledge.

Components

The initial element depicted in Figure 1 illustrates the impact of primary reinforcement and the generalisations made by pupils in a classroom setting. To demonstrate their skills, students must concurrently engage in problem-solving while integrating learning knowledge and participating in learning activities. Students with limited information and attitudes towards learning activities are often perceived as slow learners and may need help to acquire abilities proficiently (Anderson & Kilduff, 2009). If the student fulfils the criteria in the first category, they possess curiosity, autonomy, and exceptional leadership abilities.

The second aspect showcases the implicit skills and abilities of the pupils. Observation is essential due to the time-consuming yet easy identification of student skills. The source cited is Brown (2009). In order to foster the development of productive human capital, lecturers need to possess the ability to recognise students' implicit talents and provide guidance to help them enhance these skills. Despite the progress made in educational technology and the advent of the 4.0 Industrial Revolution, teachers still play a crucial role in helping students develop logical thinking, effective communication, and problem-solving skills.

Lecturers should enhance students' higher-order cognitive abilities by providing them with knowledge or principles related to new talents, building upon their current skill set. Lecturers can improve students' higher-order reasoning abilities by offering supplementary education and training in advanced skills. Professors employ a blend of

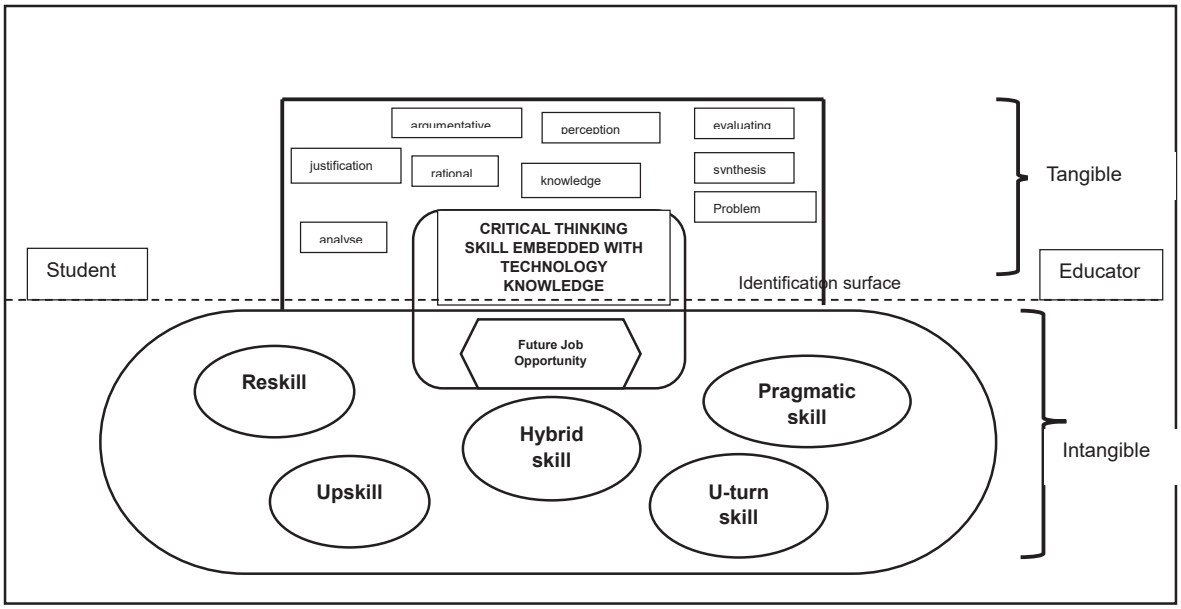


Fig. 1: Submarine Teaching Model (Mohan & Arumugam, 2021)

technical and non-technical abilities to help pupils. Hybrid skills require a diverse range of work-related abilities, including proficiency in technology and engineering.

Pragmatic skills encompass a range of interpersonal and communication talents that contribute to student's professional and personal success. Regarding U-Turn talents, instructors can motivate students to cultivate advanced cognitive abilities, such as analytical and critical thinking, to autonomously enhance their present talents if they cannot learn new ones. Some of the students should be informed of their extra competencies.

The submarine model demonstrates the connection between lecture material and student learning. Teachers at the Education Centre are required to assess the aptitude of their pupils. The teacher can guide the learner depending on their concrete and abstract abilities.

Methodology

The researchers evaluated the adequacy of the submarine teaching model using the usability assessment model (Richey & Klein, 2014). Several Education Centre lecturers were interviewed semi-structured via WebEx to determine if the Submarine Model suits the application.

The Google Form survey includes seven optional questions for respondents to answer (before exposure to the submarine model and following exposure to the submarine model). This study uses a targeted sampling strategy to comprehend students higher order thinking skill as in tangible and intangible competencies. The sample enables the researcher to determine which participants are pertinent and appropriate for the study. In a three-week survey, 10 lecturers from a population of 15 lecturers who teach at the Education Centre were chosen using a stratified random sample.

Analysis and Findings of the Study

A sample of 10 respondents, who are lecturers at an education centre, were chosen to answer seven questions in a Google Form. The lecturers identified the questionnaires related to the Submarine Teaching Model's higher-order thinking skills (specifically critical thinking). They gave feedback on their perceptions of students' higher-order thinking skills in tangible and intangible competencies. The duration of the course is 14 weeks every semester. The pre-exposure survey findings of the submarine teaching model.

Before exposure to the submarine model, the Education Centre lecturers failed to understand students' higher order tangible and intangible thinking skills. Descriptive data from Q1 showed that only three lecturers knew students' significant talents based on higher order thinking skills (critical thinking). Q3, show only 13% of lecturers practice reskill/upskill / hybrid skill / U-turn skill or pragmatic skill to help students become potential human capital. 9 or 60 % of lecturers are not aware of their students' field of interest. However, lecturers "perceive the wisdom of their students" based on their general skills, which is 7 or 80 per cent. The results also show that some lecturers consider their students' as weak based on their exam result ((Q6); 8 or 57%). However, 7 lecturers acknowledge unfamiliar with technology that can help students become thriving human capital (S7) of 13 people or 87%.

Table 1: Questionnaire on Lecturers' Understanding of Tangible and Intangible Skills After Submarine Teaching Model Exposure (Google Form)

No	Item	No		
		Bil	Bil	Bil
Q1	Do you help students develop their tangible skills?	7	0	3
Q2	Do you agree that technology can help enhance the ability of students to become efficient human capital?	9	0	1
Q3	Do you think students are weak based on the exam results?	0	7	3
Q4	Are you aware of your student's field of interest?	6	0	4
Q5	Do you practice retraining/developmental/hybrid skills to help students develop into potential human capital?	8	0	2
Q6	Do you know what skills are essential to your students based on higher order thinking skills (critical thinking)?	7	0	3
Q7	Have you ever practiced U-turn and pragmatic competencies?	5	3	2

Education Centre lecturers have implemented the submarine teaching methodology, which they had previously introduced over three weeks, with students inside and outside the classroom. The lecturers demonstrated their interaction with students by responding to the revised questionnaire. Table 1 displays the instructors' remarks about their comprehension of the submarine teaching methodology. Most lecturers comprehended the students' higher-order thinking talents and tangible and intangible competencies from their comments on the modified questions in the Google form.

In the first quarter, 80% of the presenters, which amounts to 12 individuals, enhanced students' innate

abilities. In a similar vein, the findings from the Q2 survey indicated that 93% of instructors at the education centre concurred that technology could enhance students' capacity to develop into successful human resources. Upon comprehending the submarine teaching approach, instructors no longer prioritise exam outcomes as an indicator of student accomplishment (Q3). During the fourth quarter, nine teachers were knowledgeable about the field that their students preferred, in contrast to six doubtful lecturers. Q5 demonstrates a deviation from prior familiarity with the submarine instructional approach. Out of 10 lecturers, eight have confirmed that they are currently engaging in reskilling, upskilling, or hybrid skill development to enhance the student's potential as valuable human resources. The results of this study align with the findings of Zulkifly et al. (2021), demonstrating that educators who possess a comprehensive understanding of their students' abilities can facilitate their instruction and enhance their self-efficacy.

Meanwhile, in Q6, seven lecturers were aware of the significant abilities of students as determined by their high-order thinking skills (precisely, critical thinking skills). Of the ten lecturers, 67% already possess U-Turn abilities and are familiar with its practical applications. These findings indicate that before being introduced to the submarine teaching model, instructors needed to recognise the significance of higher-order thinking abilities for students since they believed that the program's teaching methods were sufficient owing to their engaging nature.

Based on the survey's objectives and findings about the submarine teaching model, it was found that most educators at the Education Centre regularly conducted teaching and learning activities with students who needed to be made aware of the available resources for education students. The polls indicated that the submarine teaching paradigm baffled stakeholders. The focus was on both the tangible and intangible aspects of student abilities. While some educators acknowledge the skills of their pupils, they often prioritise their examination results. Based on the endorsement of lecturers who are experts in the field, it has been determined that the submarine teaching approach holds significant value.

As a result, it is imperative for education students to actively contribute to developing human capital in our nation. Makki, Khalick, and Bou Joude (2003) argue that a model's components should consider students' future potential and provide advantages to teachers. Based on input from academics at the Education Centre, it has been observed that most students have the potential to create dynamic human capital based on the idea. The academics at the Education Centre can utilise it.

Conclusion

The utilisation of the submarine teaching model in this research highlights the correlation between teaching practice and the cognitive abilities that lecturers at the Education Centre must observe. The study's findings suggest that the Submarine Teaching Model can help Education Centre teachers analyse the fundamental components and support students in becoming employable graduates or prospective human resources. Education students may improve their higher-order thinking abilities by acquiring additional skills such as reskilling, upgrading, pragmatic, hybrid, and U-turn skills. The instructors at the Education Centre are continuously working towards the progress of university students. As a result, the submarine teaching model aims to combine the identification of students' concrete and intangible abilities while also strengthening their capabilities for future development. Malaysian researchers in high school or elementary school settings can analyse the Submarine Teaching Model to assess students' cognitive capacities in both concrete and abstract thinking.

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