AENSI Journals

Australian Journal of Basic and Applied Sciences

ISSN:1991-8178

Journal home page: www.ajbasweb.com

Assessing *Hots* Through Case-Based Approach In Teacher Training

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ARTICLE INFO

Article history:
Received 30 September 2014
Received in revised form
17 November 2014
Accepted 25 November 2014
Available online 6 December 2014

Key words:
case-based approach (CBA), posing questions, HOTS, Bloom's taxonomy

ABSTRACT

With the Malaysia Education Blueprint (2013-2025), educators in Malaysia are facing increasing challenges to help prepare our students for a full and productive life in this 21st century. Today's students must be able to communicate and collaborate, research ideas, collect, analyze and synthesize information. To help develop these higher-order skills, students need to participate in complex, meaningful tasks that require active engagement, collaboration, research and problem solve. One way of achieving this higher order learning is for educators to develop and implement case-based approach (CBA) in classroom learning. This approach to learning and instruction also helps to promote student-centered, small group, interactive and authentic learning experiences, instead of large group, didactic, lecturer-centered instruction. This paper relates a study of questions posing by Bachelor of Teaching semester 8 student teachers from five case scenarios given. Students were asked to compose as many questions as possible from the cases. These questions were analyzed according to the levels of complexity found in Bloom's taxonomy. Students were divided into high and moderate achievers and the number and level of questions composed were compared between this two group of students. The finding showed that the high achievers not only composed more questions, they also composed more higher level of questions.

To Cite This Article: Chin Phoi Ching, PHd., Assessing Hots Through Case-Based Approach In Teacher Training. ***Aust. J. Basic & Appl. Sci.,*** *8(23): 191-195, 2014*

INTRODUCTION

In a borderless and globalised world today it is imperative for a nation to produce high-quality human resources and educationists have realized that besides the 3Rs (Reading, wRiting & aRithmetic) our students require a new set of skills and competencies to face a more complex life and work environment in the 21st century. Therefore a focus on creativity, critical thinking, communication and collaboration is essential to prepare students for the future workforce. Students must learn the essential 7Cs of 21st century lifelong skills for success in today's new global economy namely critical thinking, creativity, collaboration, communication, cross-cultural understanding, computer literacy, and career and life skills.

Singapore's Ministry of Education states that individuals equipped for the 21st century will be a confident person, a self- directed learner, an active contributor, and a concerned citizen whereas in Finland, the core 21st century goals are for personal growth, cultural identity and internationalism, media skills and communication, participatory citizenship, responsibility for the environment, and ensuring personal well-being and a sustainable future. In Malaysia, the Ministry has defined a set of skills and competencies that are aligned with the National Education Philosophy which will give Malaysian students an internationally competitive edge. To achieve this goal, the national curriculum aims to create balanced, resilient, inquisitive, principled, informed, caring, patriotic, as well as effective thinkers, communicators, and team players (Malaysian Education Blueprint, 2013-2025).

As stated in the Malaysian Education Blueprint, every student needs to learn how to continue acquiring knowledge throughout their lives, to be able to connect different pieces of knowledge, and to create new knowledge. These higher-order thinking skills are especially critical in a rapidly changing technological world. One of the key attributes required of ever student to be globally competitive is acquiring thinking skills. In our Education Blueprint, it is stressed that all student needs to master a range of higher cognitive skills like critical thinking and reasoning, plus creative thinking and innovation. This is the area where Malaysia's education system requires more improvement, as reflected in the latest TIMSS and PISA scores which indicate that Malaysian students are less able to apply knowledge and think critically outside of familiar academic contexts. As a result, there have been frequent calls to incorporate and increase thinking skills in schools and higher

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education. It is also getting more and more important than ever for the education system to help every student acquire these higher order thinking skills.

Thus the pertinent question for educators today is **how** to help every student acquire these higher order cognitive skills. One such effort is for educators to use case-based approach.

Theoretical Background:

Case-based learning was employed in law and medicine schools as early as the late 1800's. It has also been popular in business schools since the early 1900's. In the field of education case-based learning has a long history tracing back to the 1920's when John Dewey introduced the philosophy of "real world" application of content. However, the use of case studies has become of increasing interest to those in many areas of education and educational research since the 1980's. In Malaysia University Pertanian Malaysia and University Tun Abdul Razak (UNIRAZAK) have recently introduced this approach to teaching and learning in higher education. Perhaps the main reason that the case based approach has become prominent as a teaching tool is that its use agrees with the most current philosophy of learning in education, that is constructivism.

Building on the notion of social constructivism by Vygotsky, case-based learning indeed represents a paradigm shift towards a more active, collaborative and inquiry-based approach to teacher education. Case-based learning promote active, self directed learning (Perkins, 1991) through the process of applying theoretical knowledge to classroom scenarios in ways that can encourage and stimulate problem-solving, critical thinking, and decision making. As such, case-based learning ties in with the principles of social constructivism. A constructive approach to teacher education involves teachers and students constructing meaning out of cases through active participation and interaction.

Teaching cases are actually 'narratives" of accumulated experiences of experienced educators. Bruner, 1986 introduced "narrative psychology" which refers to the "storied nature of human conduct" (Sarbin, 1986) and how human beings deal with experience by constructing stories and listening to the stories of others. Psychologists believed that stories, rather than logical arguments, are the vehicle by which meaning is communicated. A case has a narrative/story detailing a set of events that unfolds over time in a particular place (Shulman, 1992, p21). It therefore has two important features which are useful for learning - their status as narratives and their contextualization in time and place.

Narrative forms of cases engage our attention, retain in the memory easily and capture our interest and commitment. Thus cases can be engaging and enriching. It helps to stimulate higher order thinking like critical and analytical thinking, problem solve and helps in decision making. Cases can be used to link theoretical principles to practice, enable students to "think like a teacher" and help to create visions and images of future practices in the real classroom (Shulman, 1992).

As for higher order thinking skills, according to Ennis's (1987) taxonomy of critical thinking dispositions and abilities, question posing is one higher order thinking skills as it is a fundamental cognitive component that guides human reasoning. Dori, Tal & Tsaushu (2003) considered posing questions as higher order thinking skills. Based on Bloom's taxonomy, the term higher order thinking skills may also be defined as the cognitive processes that includes analyzing, synthesizing and evaluating. On the other end is the lower order thinking skills like knowing and recalling of information. Additional examples of higher order cognitive processes are constructing arguments, asking research questions, making comparisons, solving complex problems, dealing with controversies, and identifying hidden assumptions (Resnick, 1987).

Since posing questions is one higher order thinking skills, assessing questions posed by students can be used to assess any evidence of higher order thinking skills used by the students. Thus objective of this study is to investigate and assess the cognitive levels of questions composed by semester 8 Bachelor of Teaching student teachers by referring to Bloom's taxonomy of cognitive objectives. Zohar & Dori (2003) compelling evidence shows that low achieving students and higher order thinking are not mutually exclusive. In view of this compelling finding, this study would also like to look at any significant differences between high and moderate achievers in terms of the number and levels of questions posed.

Objectives of Study:

i. To assess the number and level of complexity of questions composed according to Bloom's taxonomy
ii. To study differences in the number and level of complexity of questions formed between high and moderate achievers**.**

Methodology:

In semester 8, student teachers in Malaysia's Institute of Teacher Education follow a course entitled *Teacher leadership and Professional Development*. In this course one of the topics covered is regarding ethics and accountability. Their course assignment includes analyzing a case with structured higher order questions given. In this study, five case scenarios used were about ethical dilemmas. These case scenarios were designed with built-in ethical dilemmas for both case discussions and analysis. Each student is given 5 case scenarios (see

appendix) after they have handed in their official course assignments. They were told to read and study these cases and then they were asked to compose as many questions as possible. This task is the reverse of the official course assignment given whereby in this study the students were asked to construct questions based on each case scenario. Specifically the task is "You are asked to design an assignment for your friends. Compose as many questions as you can about the case scenarios you have read". Students were given 45 minutes to write out their questions on the pages provided.

Questions composed were collected and totalled up. A total of 275 questions were obtained from the class of 18 students. These questions were then analyzed according to Bloom's taxonomy of cognitive objectives. It was checked and rechecked by the researcher and a final checking was done by an internal-external examiner from the institute. The final results are tabulated in the table below.

Data Analysis:

Table 1: *Total number and level of questions.*

Sample	Total questions	BLOOM'S TAXONOMY					
		Knowledge	Compre-hension	Application	Analyze	Evaluate	Create
Overall (18)	275 (100%)	5 (1.8%)	21 (7.6%)	1 (0.3%)	177 (64.4%)	59 (21.4%)	12 4.4%)
High Achievers (9) (CPGA >3.2)	152 (55.3%)	3	8 (2.9%)		91 (33.1%)	42 (15.3%)	8 (2.9%)
Moderate Achievers (9) (CGPA<3.2)	123 (44.7%)	2	13 (4.7%)	1	86 (31.3%)	17 (6.1%)	4 (1.5%)

Findings And Discussions:

The total number of questions constructed is 275 out of which 64.4% questions are *analyzing* questions followed by 21.4% of *evaluating* questions and there were 7.6 % of questions checking for *comprehension*. 4.4 % of the questions were of the highest level (*create*) in the Bloom's taxonomy. This results showed that students are able to construct higher order questions using case scenarios with built in dilemmas. Studying cases can stimulate students to think on a higher level by composing questions of which 90.2 % of the questions (analyzing, evaluating and creating) are from the higher levels of Bloom's taxonomy.

When comparing high achievers with moderate achievers, there are differences in terms of the number of questions constructed. High and moderate achievers were determined by their CGPA. A mean of 3.2 CGPA was found. Due to the small sample size and the CGPA mean of 3.2 C, this group of students were divided into high achievers (>3.2) and moderate achievers (=<3.2). The high achievers constructed more questions than the moderate achievers by a difference of 10.6% (refer table 1). In terms of the levels of questions, the high achievers constructed more higher level questions than the moderate achievers, 1.4% more on 'creating' questions, 9.2% more on 'evaluating' questions and 1.8% more on 'analyzing' questions. High achievers can construct significantly more on 'evaluating' questions. The moderate achievers managed to construct one 'application' question and they constructed more low level 'comprehension' questions than the high achievers by 1.8%.

Thus results of this study show that a high number of higher order questions was constructed using cases with built-in ethical dilemmas by high achievers. Thus case scenarios can be used to stimulate higher order thinking skills and it can be used both ways: analyzing cases with structured questions given or constructing questions from case scenarios given. This study also shows that constructing higher order questions is more easily done by high achievers and thus contradicting the findings in Zohar & Dori (2003)

Limitations and The Way Forward:

This one-off study involves a small sample size as the researcher has to make do with the available number of students thus convenience sampling was done. For future studies, a bigger sample size is more favourable. In analyzing the level of questions, a third party should help to validate the levels so as to triangulate the results.

Professional development activities should be carried out so that teachers or educators have an adequate understanding of case-based method of teaching and learning. To increase teachers' understanding of case methods, it would be productive for teachers to engage in development of cases and its uses. Teachers should also be encouraged to design and collect cases that document "wisdom of practice" or examples of effective teaching practices. Shulman (1992) in his paper mentioned that those who wish to introduce case methods must commit themselves to writing and producing cases and carry out serious investigations of learning and teaching with cases.

To further engage in case-based method or learning, educators can develop research on the effects of case-based learning for example comparing the use of case-based instruction with other instructional methods and techniques. Another aspect that can be researched is to focus on the difference between video, written and a combination of video and written cases in hypermedia format. It is reasonable to expect the medium in which cases are presented would result in different outcomes (Merseth, 1996).

In conclusion, to sustain interest in case-based approach in teaching training, leaders in the field of teacher education should encourage developing more case materials and to be involved widely in empirical research so as to reinforce understanding of case-based instruction. Case-based instruction not only offers a promising opportunity for teacher educators to explore challenging pedagogies in teacher training but also offers great opportunities for students to be critical and reflective thinkers – an important requisite in today's rapidly changing and challenging world.

Appendix:

An example of a case scenario

You are a newly appointed teacher and you are asked to invigilate a final year examination. It is not in your subject but you recognize some of the students from your own class. About half-way through the exam, one of the students known to you puts up her hand and asks to be accompanied to the toilet. As you wait outside you hear her speaking to someone, although you can't hear what she is saying. You walk into the bathroom and see that she is speaking to someone on a mobile phone. She immediately turns it off when she sees you. The students claims that it was a personal phone call, and that she didn't know that mobiles weren't allowed in the exam hall. You find that she was cheating. In you experience, she is an amiable and hard working student.

Task: You are asked to design an assignment for your friends. Compare as many questions as you can about the case scenario you have read.

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