HOW HIGH CAN STUDENTS THINK?

A STUDY OF STUDENTS COGNITIVE LEVELS

USING BLOOMS TAXONOMY

IN SOCIAL STUDIES

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ABSTRACT

This was a simple classroom research project and its purpose was to examine how high up in the scale of Blooms taxonomy students were able to reach to understand higher order thinking skills when studying critical thinking questions. Two classes of senior high school students who had been studying in the same bilingual program for five years were compared by assessing their quality responses to a social studies project. The questions given were structured along the lines of the levels of Bloom's taxonomy from simple knowledge style questions to more complex evaluation types. Subjects were not informed that the questions had a value system. The results indicated that there was a difference between the two classes between those who could answer the questions & those who could not or provided wrong answers. The results showed the gap between the two classes and became more prominent as they attempted the more complex questions higher up in the scale. This also suggests that further research is needed in the area of materials development which focuses on higher order thinking skills which may incorporate exercises that encourage students to study more in-depth & use problem solving skills which are ranked high on the scale of Blooms taxonomy which in turn could lead to the development of their own motivation, self-regulation & critical thinking skills.

INTRODUCTION

For students who study social studies and who do not fully know English, learning to read in English can be difficult. They have to deal with decoding words and comprehend text which can be challenging for any student. Decoding text, or using phonemic awareness and phonics to read words, are the first reading skills most students acquire because it's highly important to be able to read correctly in English in order to know the meaning of words in their proper context. The other reading skills that students need to have are mainly connected to comprehension along with an adequate knowledge of vocabulary and fluency. As places of learning, schools are the perfect place to start students to begin to study critical and higher order thinking skills and to develop their way of thinking as they read complex texts (King Goodson & Rohani 2009). They continue to state that the importance of preparing students to become responsible, active members of their society is a complex process which involves many years of personal and formal study but also from the hidden curriculum of life. Similarly Cotton states that Schools should also allow secondary students to think and to develop problem-solving skills, including rationales that lead to their conclusions, consideration of other points of view, and analysis of various reasoning processes (Cotton, 1997, p. 6). Higher order thinking skills or HOTS as they are more commonly called also teaches students to think critically which is thinking that involves logical thinking and reasoning including skills such as comparison, classification, sequencing, cause/effect, patterning, webbing, analogies, deductive and inductive reasoning, forecasting, planning, hypothesizing, and critiquing (Johnson & Lamb 2011). According to Pogrow higher order thinking skills are valued because they are believed to better prepare students for the challenges of adult work and daily life and advanced academic work and higher order thinking may also help raise standardized test scores.

A curriculum emphasizing higher order thinking skills has been found to substantially increase math and reading comprehension scores of economically disadvantaged students (Pogrow, 2005).

In his publication Measuring Thinking Skills in the Classroom Stiggins states the importance of the improvement of reasoning skills. A key to success in improving such skills will be the ability of the individual teacher to measure skills in a valid and reliable manner. His research covers topics including measuring thinking skills, learning to plan an assessment, & making assessment work in the classroom. His five categories of thinking skills are defined as: (1) recall; (2) analysis; (3) comparison; (4) inferences; and (5) evaluation (Stiggins et.al 1988).

But if education is to further the critical competence of students, school must also provide them with the opportunity at the level of the classroom to observe, imitate and practice critical agency and to reflect upon it. Learning contexts must be chosen which students can make sense of and in which they can develop a feeling of social responsibility. This leads on in to which instructional strategies are 'effective' in enhancing critical thinking? Learning to think critically is conceptualized as the acquisition of the competence to participate critically in the communities and social practices of which a person is a member of (Geert Ten Dam Monique Volman 2004). Marzano also adds to the complex tasks of HOTS when he states that integrating is another skill that should be involved with HOTS connects or combines prior knowledge and new information to build new understandings. Bloom called this synthesis. (Marzano 2003). In the world of ICT there are also useful tools used in information communication and technology to engage students in higher-order thinking. There are four types of ICT tools which are discussed by Lim and Tay in their article in the journal of educational multimedia and hypermedia in it they discuss informative, situating, constructive, and communicative tools as important in developing higher order thinking skills. (Cher Ping Lim, Lee Yong Tay 2003). In the article Teaching Students

Higher-Order Thinking Skills Davies states that when teaching students higher-order thinking skills, he emphasized Bloom's Cognitive Taxonomy: knowledge, comprehension, application, analysis, synthesis, and evaluation. To reach each of the higher-order thinking skills, He incorporates topic elaborating questions into worksheets and group discussions. These questions include: What is it? How does it work? What are its interesting characteristics? How do these characteristics change? What are these changes related to? What would/could happen if? What could/should be done about it? Davis offers a model for teaching higher order thinking skills in that when teaching it he also models each skill, to develop a framework to attach to each complex skill, gradually increasing the complexity of each skill, scaffold each practice opportunity closely, and teach the skill in a low content context before applying content to later to practice opportunities. Finally, once students have learned the skill, they are taught them when it is appropriate to use each skill – meta-cognition (Candace Davies 2011).

The classic range of cognitive skills used by educationalists was first set out by Benjamin Bloom and his colleagues in the late 1950's. In it, they formed what is known today as the Taxonomy of Educational Objectives. Bloom's Taxonomy as it is often referred to is, a classification system for educational goals that could be used in the construction of test items and in the formulation of instructional objectives by classroom teachers and educational leaders alike. It is the decision and the responsibility of every teacher to interpret these goals in lessons and tests to encourage students to progress through each level to achieve higher order thinking skills. In order for teachers to achieve this, a starting point must be arrived at. Research has shown the true value of reading as an aid to successful study and forming all important critical thinking skills that all students must achieve if they are to broaden their vocabulary and increase their understanding of contextual information.

Students with larger vocabularies find reading easier, read more widely, and do better in school. Conversely, children who enter school with limited vocabulary find reading difficult, resist reading, learn fewer words, and consequently fall further behind (the Mathew effect) researchers have also stated that vocabulary deficiencies are a primary cause of academic failure in grades 3 through to 12. (Stanovich, 1986).

RESEARCH

The research for this study was conducted at Saint Joseph Bangna School between May and September of 2011. Two classes of Mathayom 5 students who had been studying in an English Program for five years were involved in the study as they represented the highest standards of achievements in that school in both English and social studies. Permission was given by the administration to conduct the research, in which the participants were given specially designed question style worksheets that had questions related to the levels of Blooms taxonomy. The researcher designed the research around 3 key questions which were;

1. What are the established levels of higher order thinking skills?
2. What levels can students actually study successfully?
3. What can be done to help students achieve higher levels of cognition?

To this the following objectives of this study were to research all of the established levels of Blooms Taxonomy that could be used when studying social studies in English, then to record and analyze what actual levels students can understand successfully when completing study questions. Thirdly it was to propose measures which could be used to strengthen student's higher order thinking skills & understanding of these levels and make suggestions about teaching content. Accordingly, the researcher carried out the following objectives:

1. To research the full range of Blooms Taxonomy use to teach a range of social studies subjects.
2. To record and analyze what levels students can actually achieve successfully as data.
3. To propose what could be achieved to improve levels of understanding using Blooms Taxonomy.

RESEARCH METHODOLOGY

The research was carried out by the researcher who designed question sheets with a set number of questions written in a style based on the various levels of questions related to Blooms Taxonomy. The worksheets were given to the students as individual projects and they were given four weeks to complete them. Mean scores were used to calculate the figures after the allotted time. The meaning of correct and successful answers for this study meant that students answered each question accurately using the facts similar to that which was contained in their course books. To give the participants as much encouragement and opportunity to complete as much of the worksheets as possible and to ask questions during the research, an open book session was used throughout the time period and the students received only guidance from the teacher, who was also the researcher.

RESULTS

The results were sorted in to two groups. Group one, were those students who completed the whole sheet and answered the questions correctly therefore showing a full understanding of all levels of Blooms Taxonomy. Group two was those students who either partially completed the questions or didn't complete the worksheets showing a limited understanding of the questions; see table 1.

Total number of students	36
Group 1 students who completed the questions correctly	41.66%
Group 2 students who partially completed the questions	58.33%

Table 1 showing the distribution of means scores between the two groups.

DISCUSSION

This study was important because as the results show it highlighted low and high areas that can be useful to reflect on the key areas of study that seemed to be missing especially in the areas of higher order thinking skills as a prerequisite to reading context rich text and at the same time understanding new vocabulary, language and syntax practice. The principle results also show the teacher what percentage of students who understood the full range of questioning skills needed to tackle context rich texts and who are more likely to benefit from a wider understanding of the grammar, vocabulary and syntax in other subjects and therefore less likely to fall in to the Mathew effect. This was useful for planning future lessons and choosing reading texts. The majority of these students had been studying at the school's bilingual program for some years and had also been studying science based subjects; one student in

particular had been studying in an International school. The results may also indicate how successful a bilingual program can be. It was also interesting to note that many of the students who were in group two and who didn't complete the higher level questions were new students to the English program who had only started to study at this school less than three years ago.

CONCLUSIONS

It was clear by the results that there was a difference in the levels of student's knowledge of their understanding of the key words in the questions used and this reflected in the responses and answers they gave. The results showed that only 41.66% of students had a sound knowledge of the six levels of Blooms Taxonomy ranging from knowledge to evaluation. The remaining group 58.33% showed less understanding of the levels. For analysis and conclusion purposes those students who submitted completed papers but had insufficient answers were treated the same as those who submitted no answers in that it gives the researcher / teacher an easier fixed number to assess those students who need extra help with reading and comprehension exercises when using content rich text which demand higher order thinking skills and in daily life in the class. Looking at the results also acts as a kind of benchmark for teaching that gives an indication of the kinds of in-class work and levels of them that students can do comfortably and what levels of questioning and theoretical knowledge they need help with using specialist supporting materials if necessary, but not only for social studies this may also apply to other subjects especially science.

This study also highlights the importance of what Stiggins was stating earlier regarding the importance of the improvement of reasoning skills among students. But how much of it is a key to success in improving the ability of the individual teacher to measure skills in a valid and reliable manner so that they can plan lessons with more accuracy and to know at which level to begin lessons with a view to improving student's higher order thinking skills. This survey achieved what it set out to do in that the levels of Blooms Taxonomy were used to assess the abilities of students who can and cannot study effectively using this particular benchmark as a rule for this group of students.

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