

## Investigating the Cognitive Processes in the Tests of *Top-Notch* Series using the Bloom's Taxonomy

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**Abstract** – One of the practical frameworks for analysis of cognitive processes in textbooks is Bloom's taxonomy. The significant principle of the taxonomy is that learners' knowledge can be organized in a hierarchy from less to more complex cognitive processes (i.e., remembering, understanding, applying, analyzing, evaluating, and creating). The objective of this study was to analyze test items in the *Top-Notch* series (the textbooks which are used for teaching of English in Iran) in terms of the revised Bloom's taxonomy (RBT) to find out which levels of the taxonomy were reflected more in the test items. To this end, test items of the *Top-Notch* series in three levels (i.e., elementary, intermediate, and advanced) were analyzed and the frequencies and percentages of each level were calculated. The results indicated the representation of the lower-order skills (i.e., remembering, understanding, and applying) and the absence of higher-order skills (i.e., analyzing, evaluating, and creating) in the tests. The findings imply that the *Top-Notch* tests cannot engage English as foreign language (EFL) learners' in critical thinking and are not so appropriate for the assessment of course objectives.

**Keywords:** textbooks, the revised Bloom's taxonomy; *Top-Notch* series; tests

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### I. INTRODUCTION

Textbooks play an important role in the realm of language education, and are considered as the second important factor in language classrooms, following the important role of the teachers (Riasati & Zare, 2010). Textbooks are "a guide for a teacher, a memory aid for the pupils, and a permanent record or measure of what has been learnt" (Hutchinson & Torres, 1994, p. 315). The textbook is a useful tool in the hands of the teacher, especially the novice teachers; without a textbook, it is difficult for a novice teacher to deliver his teaching to the students. Thus, the teachers should know not only how to use the textbook, but also how effective it can be (Sheldon, 1998).

One of the universal teaching materials is second/foreign language (L2) textbooks, which represent the visible heart of any English language teaching (ELT) programs (Sheldon, 1988). L2 textbooks can reflect trends in ELT, learners' diverse pedagogic, psychological, and linguistic preferences and biases of their authors (Allwright, 1982). Therefore, ELT textbooks along with assessment should be given much attention; an effective textbook will not be developed unless it accompanies a follow-up accurate assessment. Many authors and scholars (e.g., Farhadi, Jafarpur, & Birjandi, 1994; Morrison, 2008) have argued for the

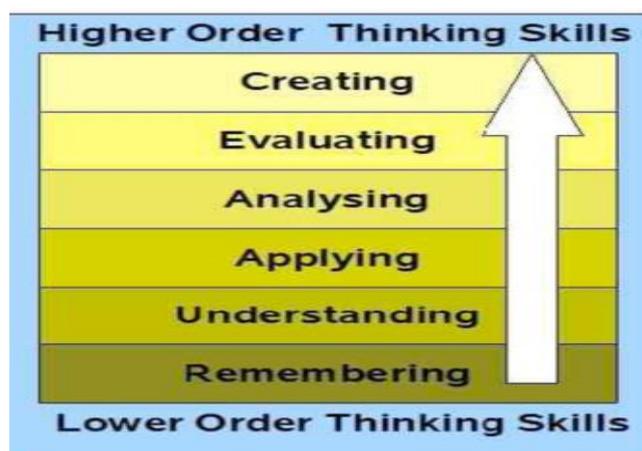
importance of assessment and tests in ELT curriculum because of all the decisions made about L2 learners in teaching processes. Assessment is the systematic process of determining educational objectives, gathering, using, and analyzing information about students' learning outcomes to make decisions about programs, individual student's progress, or accountability (Erwin, 1991). In light of this issue, this study intends to examine to what extent tests items of *Top-Notch* series, which is commonly used in Iranian language schools, are suitable in English as a foreign language (EFL) contexts; more specifically, it investigates the extent to which it represents the cognitive processes as outlined in the revised Bloom's taxonomy (RBT). Bloom's taxonomy refers to a classification of the different objectives that educators set for students (Bonner, 1999). It is very useful in test designing and material developments (Downing & Haladyna, 1997). *Top-Notch* series is used in the EFL curriculum in Iran; consequently, the evaluation of the tests for these textbooks is very useful in teacher development and professional growth.

## II. LITERATURE REVIEW

Bloom (1956) initially pointed out the cognitive domain revolves around knowledge, comprehension, application (i.e., lower-order cognitive processes), analysis, synthesis, and evaluation (i.e., higher-order cognitive processes). The cognitive processes, according to Huitt (2011), were moving from the simplest process (i.e., knowledge) to the most complicated one (i.e., synthesis). Anderson and Krathwohl (2001) later updated the earlier taxonomy and called it the revised Bloom's taxonomy which included remembering, understanding, applying, analyzing, evaluation, and creating processes (see Figure 1). According to Hanna (2007), the six categories in the cognitive processes changed from noun to verb forms due to the fact that thinking was considered as an active process; the developers of the RBT framework preferred verbs because they believed that verbs could describe the action involved in thinking and cognition in a better way. The cognitive processes of the RBT are ordered from simple remembering to higher-order creative thinking processes (Anderson & Krathwohl, 2001, pp. 67-68):

- Remembering: retrieve relevant knowledge from long-term memory.
- Understanding: construct meaning from instructional messages, including oral, written, and graphic communication long-term memory.
- Applying: carry out or use a procedure in a given situation.
- Analyzing: Break materials into parts and determine how the parts relate.
- Evaluating: Make judgments based on criteria and standards.
- Creating: Put elements together to form a coherent or functional whole.

The hierarchical model of Bloom's taxonomy is widely used in the fields of education and in constructing test items to ensure balancing and students' cognitive mastery (Oliver, Dobebe, Greber, & Roberts, 2004).



**Figure 1.** *Cognitive processes in the RBT.*

ELT materials have been evaluated by many researchers. For instance, Morgan (2003) evaluated IELTS preparation materials and showed that such materials did not provide learners with enough knowledge to achieve their vocational or academic goals. Moreover, Riasati and Zare (2010) evaluated *New Interchange* series (Richards, Hull, & Proctor, 2005) to determine overall pedagogical value and suitability of the series from teachers' point of view. The results demonstrated that the textbooks suffered from a number of weak points requiring teachers' awareness and consideration. In addition, employing a questionnaire, Nemati (2009) analyzed pre-university textbook used in Karnataka state of India in terms of general criterion and vocabulary teaching. Nemati discovered that 70% of the teachers had a positive view towards this textbook, but there was a need to do some modification in the sequence of presenting texts. Moreover, Rahimpour and Hashemi (2011) also evaluated the three ELT textbooks used at high schools in Iran in order to find out the extent to which the ELT textbooks were effective from the high school English teachers' perspective. The results showed that the textbooks were not appropriate from the teachers' point of view as to the vocabulary, reading, grammar, language function, and pronunciation practice, their physical make-up, and some practical concerns.

The review also shows that there are some studies which have applied Bloom's taxonomy; however, such studies are comparatively quite small in number. For instance, Riazi and Mosalanejad (2010) analyzed Iranian high school and pre-university ELT textbooks in terms of Bloom's taxonomy. The researchers concluded that these ELT textbooks pay attention to knowledge, comprehension, and application processes. In addition, Lan and Chern (2010) conducted a study in which they aimed at investigating the cognitive processes and knowledge types measured on the English reading comprehension tests of college entrance examinations administrated from 2002 to 2006 in Taiwan. According to Lan and Chern, items on remembering factual knowledge and understanding factual knowledge, which are related to the lower-order cognitive processes, constituted the majority of the test items. Moreover, Ming (2011) analyzed *New Interchange* textbooks (Richards, Hull, &

Proctor, 2005) in terms of Bloom's taxonomy. The results revealed that knowledge and comprehension processes were the most frequent cognitive processes in these textbooks.

Although much work has been done on the effectiveness of ELT materials, the appropriateness of the tests developed for ELT textbooks was ignored in these evaluation studies. No study, to the best of our knowledge, has examined the test items drawing on the RBT. This study aimed at evaluating the tests developed for *Top-Notch* series (Saslow & Ascher, 2012) in terms of the cognitive processes of the RBT; it sought to see which levels of the taxonomy were more represented in the tests of *Top-Notch* series. The current study, therefore, tried to answer the following question:

1. How are the cognitive processes of the RBT represented in the tests of *Top-Notch* series?

### III. METHODOLOGY

#### A. Materials

For the purposes of this study, the tests of *Top-Notch* series were analyzed by drawing on the cognitive processes of the RBT. *Top-Notch*, according to Saslow and Ascher (2012), is a six-level communicative course which consists of six textbooks. The corpus in the present study included the tests of *Top-Notch 1* (Saslow & Ascher, 2012a), *Top-Notch 2* (Saslow & Ascher, 2012b), and *Top-Notch 3* (Saslow & Ascher, 2012c).

The *Top-Notch* tests aim to measure all four main skills (i.e. listening, speaking, reading, and writing). In the current study, the items related to speaking skill were not included because the test items on this skill were not in the written form; this study focused on evaluating the written form test items in terms of the cognitive processes outlined in the RBT. The test for each of the *Top-Notch* textbooks was divided into three sections (i.e., listening, reading, and writing tests), consisting fifty items.

#### B. Procedure

In order to collect data, the content analysis was done qualitatively and quantitatively. In this study, the representation of the cognitive processes (i.e., remembering, understanding, applying, analyzing, evaluating, and creating) were carefully studied using the key word examples in the test items. As shown in Appendix A, descriptions of six levels as well as key words representing the intellectual activity on each level, were taken into account. In order to ensure that the content analysis was reliable, the researchers employed inter-rater and intra-rater reliability. The degrees of consistency in inter-rater and intra-rater reliability estimates were above 97, which were acceptable.

**Sample activity.** To better understand data analysis procedures, a sample of test items for *Top-Notch 2* is provided in Figure 2.

4) Listen to the conversations. Read the questions. Then listen again and circle the letter of the correct answer.

**Example:** Whose cell phone is it?  
a. Eric                      b. no one                      c. Cecelia

1. What does Jeff think Adrienne should do?
  - a. get a tattoo
  - b. ask permission to get a tattoo
  - c. cover her tattoo
2. How does Tanya feel about getting her ears pierced?
  - a. She already has her ears pierced.
  - b. She needs to get her mother's permission.
  - c. She's going to do it without her mother's permission.
3. What is Carla going to do?
  - a. look for the ring in the lost and found
  - b. return the ring to its owner
  - c. take the ring to the lost and found
4. When does Dana think modesty is important?
  - a. at work
  - b. all the time
  - c. if you are a woman
5. What does Michael want to do?
  - a. tell the waiter about the bill
  - b. ask the waiter for the bill
  - c. pay the bill and leave

**Figure 2.** A sample of listening item test.

As displayed in Figure 2, EFL students are asked to listen to the audio part and check the correct answers; they should understand the meaning of the conversation they hear and the concepts presented in the audio part, which involves understanding process. According to Bloom (1956), learners, by means of comprehension (i.e., understanding) process, can demonstrate understanding facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating the main ideas. Therefore, translation, interpretation, and extrapolation belong to comprehension process. Moreover, EFL students should recall the information provided in the conversation. Therefore, this item also engages remembering process. As Bloom (1956) states, learners though activities of this kind can show the memory of previously-learned materials by recalling facts, terms, and basic concepts.

#### IV. RESULTS

To address the research question, the frequencies and percentages of all six cognitive categories were calculated through the content analysis of the tests of *Top-Notch 1*, *Top-Notch 2*, and *Top-Notch 3*. The results are summarized in Table 1.

**Table 1. Frequency and Percentage of Six Cognitive Levels of Bloom's Taxonomy**

Tests	Cognitive Processes	Frequency	Percentage
<i>Top-Notch 1 Test</i>	Remembering	22	44
	Understanding	22	44
	Applying	6	12
	Analyzing	0	0
	Evaluating	0	0
	Creating	0	0
<i>Top-Notch 2 Test</i>	Remembering	22	44
	Understanding	22	44
	Applying	6	12
	Analyzing	0	0
	Evaluating	0	0
	Creating	0	0
<i>Top-Notch 3 Test</i>	Remembering	22	44
	Understanding	22	44
	Applying	6	12
	Analyzing	0	0
	Evaluating	0	0
	Creating	0	0

As displayed in the Table 1, remembering and understanding processes were found to be the most frequent cognitive processes (N= 22, about 44%) in the all three tests. In addition, no item was found to represent analyzing, evaluating, and creating (i.e., the higher-order processes).

## V. DISCUSSION

One major finding of this study was that the tests of *Top-Notch 1*, *Top-Notch 2*, and *Top-Notch 3* were mostly representative of remembering and understanding processes. It may be justified by Gotcher's (2012) claim about the importance of remembering process. He believes that remembering process is one of the most important cognitive processes because as a person's knowledge or information increases, there is also a development of his or her acquaintance with reality (p. 32). In other words, remembering and understanding are assumed as first levels of cognitive processes (Anderson & Krathwohl, 2001). They should initially be developed and practiced so that other cognitive processes can be achieved by classroom learners and teachers. Therefore, it could be assumed that writers of *Top-Notch* series were possibly aware of basic levels of cognitive processes and their key roles in L2 learning.

The results of the present study showed that only lower-order cognitive skills (i.e. remembering, understanding, and applying) were presented in the *Top-Notch* tests; the higher-order cognitive skills (i.e. analyzing, evaluating, and creating) of the RBT were absent in all tests of *Top-Notch 1*, *Top-Notch 2*, and *Top-Notch 3*. It can be assumed that trying to provide opportunities to help EFL learners develop the basic learning objectives, the authors of *Top-Notch* series ignored the importance of analyzing, evaluating, and creating. However, it is very beneficial and necessary to provide higher levels of learning objectives. Bloom (1956) tried to develop a framework for education based on learning objectives moving from the lowest level (i.e., remembering) to the highest one (i.e., creating). However, as the above results showed, the *Top-Notch* textbooks did not show the progress trend. That is, along with increasing students' L2 proficiency and moving from the lower advanced-level to the higher advanced-level, the representation of cognitive processes did not change greatly in these ELT textbooks. Perhaps the written test items lend themselves better to lower-order cognitive processes.

The close examination of other studies on ELT textbook evaluation shows that almost the same results were found as regards the content of textbooks. For instance, Riazi and Mosalanejad (2010) analyzed Iranian high school and pre-university ELT textbooks. They reported that knowledge process (i.e., remembering) was the most frequent process. In addition, Roohani, Taheri, and Poorzanganeh (2014) analyzed *Four Corners, Book 2* and *book 3* (Richards & Bohlke, 2012) and found that remembering process was the most frequently represented process in the activities of *Four Corners* textbooks. Therefore, the results from the above studies show that remembering process, as the first and the simplest cognitive process within the RBT framework, is highly represented in many ELT materials.

## VI. CONCLUSION AND SUGGESTIONS

Language tests seek to recognize what test takers can do with language (McNamara, 2000), and to what extent they are successful in performing purposeful and relevant tasks (Heaton, 1990). Thus, the selection and development of effective test items are so important; it is also so important to see how effective they can be in representing our learning objectives. The present study evaluated the test items of the *Top-Notch* series (i.e., *Top-Notch 1*, *Top-Notch 2*, and *Top-Notch 3*) in terms of the representation of the cognitive processes outlined in the RBT framework (a practical tool for instructional assessment and evaluation). The results of the current study showed that the *Top-Notch* textbooks were, to a high degree, representative of the lower-order levels of cognitive processes, particularly remembering and understanding processes. This issue suggests that L2 test developers need to engage EFL students in higher-order skills by adding supplementary items to the tests of *Top-Notch* series. It is recommended that the test designers modify the test items developed for these ELT materials to engage skills such as predicting, using contextual clues, guessing meaning of words through context, interpreting texts, and evaluating a text critically.

## REFERENCES

- Allwright, R.L. (1982). Perceiving and pursuing learners' needs. In M. Geddes & G. Sturtridge (Eds.). *Individualisation* (pp. 24-31). London: Modern English Publications.
- Anderson, L., & Krathwohl, D. A. (2001) *Taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. New York: Longman.
- Bloom, B. S. (Ed.). (1956). *Taxonomy of educational objectives handbook: Cognitive domain*. New York: McKay.
- Bonner, S. E. (1999). Choosing teaching methods based on learning objectives: An integrative framework. *Issues in Accounting Education*, 14(1), 11-15.
- Downing, S. M., & Haladyna, T. M. (1997). Test item development: Validity evidence from quality assurance procedures. *Applied Measurement in Education*, 10(1), 61-82.
- Erwin, T. D. (1991). *Assessing student learning and development: A guide to the principles, goals, and methods of determining college outcomes*. San Francisco: Jossey-Bass.
- Farhadi, H., Jafarpur, A., & Birjandi, P. (1994). *Testing language skills: From theory to practice*. Tehran: SAMT.
- Gotcher, D. (2012). *A précis of the taxonomy*. Retrieved August 10, 2014, from: <http://authorityresearch.com/2010-01%20A%20precis%20of%20Blooms%20Taxonomy.html>
- Heaton, J. B. (1990). *Writing English language tests*. London: London and New York.
- Hanna, W. (2007). The new Bloom's taxonomy: Implications for music education. *Arts Education Policy Review*, 108(4), 7-16.
- Huitt, W. (2011). *Bloom et al.'s taxonomy of the cognitive domain: Educational psychology interactive*. Valdosta, GA: Valdosta State University.
- Hutchinson, T. & Torres, E. (1994). The textbook as agent of change. *ELT Journal*, 48(4), 315-328.
- Lan, W., & Chern, C. (2010). Using revised Bloom's taxonomy to analyze reading comprehension questions on the SAET and the DERT. *Contemporary Educational Research Quarterly*, 18(3), 165-206.
- McNamara, T. (2000). *Language testing*. Oxford: Oxford University Press.
- Ming, G. (2011). *Foreign and local textbook evaluation in the Exam-oriented environment at Private College in China*. Unpublished Thesis. Guangxi University, China.
- Morgan, T. (2003). IELTS preparation materials. *ELT Journal*, 57(1), 66-76.
- Morrison, G. R. (2008). *Fundamentals of early childhood education*. London: Longman Press.
- Nemati, A. (2009). Evaluation of an ESL English course book: A step towards systematic vocabulary evaluation. *Journal of Social Science*, 20(2), 91-99.

- Oliver, D., Dobebe, T., Greber, M. & Roberts, T. (2004). This course has a Bloom rating of 3.9. *Proceedings of the Sixth Conference on Australasian Computing Education, New Zealand, 30*, 227-231.
- Rahimpour, M., Hashemi, R. (2011). Textbook selection and evaluation in EFL context. *World Journal of Education, 1*(2), 62-68.
- Riasati, M. J., & Zare, P. (2010). Textbook evaluation: EFL teachers' perspectives on *New Interchange*. *Studies in Literature and Language, 1*(8), 54-60.
- Riazi, A. M., & Mosallanejad, N. (2010). Evaluation of learning objectives in Iranian high school and pre-university English textbooks using Bloom's Taxonomy. *TESL EJ, 13*(4), 1-16.
- Richards, C., & Bohlke, D. (2012). *Four Corners, student's book 2 and 3*. New York: Cambridge University Press.
- Richards, J. C., Hull, J., & Proctor, S. (2005). *New Interchange series* (3rd ed). England: Cambridge University Press.
- Roohani, A., Taheri, F., & Poorzanganeh, M (2014). Evaluating *Four Corners* textbooks in terms of cognitive processes using Bloom's revised taxonomy. *RALS, 4*(2), 51-67.
- Saslow, J. M., & Ascher, A. (2012a). *Top-Notch: English for today's world, Top-Notch 1* (2nd ed). New York: Pearson Longman.
- Saslow, J. M., & Ascher, A. (2012b). *Top-Notch: English for today's world, Top-Notch 2* (2nd ed). New York: Pearson Longman.
- Saslow, J. M., & Ascher, A. (2012c). *Top-Notch: English for today's world, Top-Notch 3* (2nd ed). New York: Pearson Longman
- Sheldon, L. (1988). Evaluating ELT textbooks and materials. *ELT Journal, 42*(2), 237-246.

**APPENDIXES**

**Appendix A**

Descriptions of the Cognitive Processes of Bloom's Taxonomy

<b>Level</b>	<b>Key words</b>	<b>Examples</b>	<b>Sample task rubrics</b>
<i>Remembering</i>	Define, describe, identify, label, list, match, name, outline, reproduce, select, state	The student recalls and/or quotes information from memory to the teacher.	Fill in the blanks with appropriate words.
<i>Understanding</i>	Describe, estimate, explain, extend, generalize, infer, interpret, paraphrase, predict, rewrite, summarize, translate	The student translates, comprehends, or interprets information s/he has received.	Answer the questions according to the reading.
<i>Applying</i>	Apply, change, compute, demonstrate, discover, manipulate, modify, predict, prepare, produce, relate, show, solve, use	The student applies the new information in his/her future assignments or classroom activities.	Make sentences using the given pattern and words.
<i>Analyzing</i>	Analyze, breaks down, compare, contrast, discriminate, distinguish, identify, illustrate, infer, outline, relate, select, separate.	The student compares and contrasts a new structure to the ones previously learned.	Compare the following words to see how they sound differently
<i>Evaluating</i>	Appraise, conclude, critiques, evaluate, judge, justifies, relate, support	The student selects the most effective solution to a problem and is able to justify it.	Which of the followings is the best answer to the question? Why?
<i>Creating</i>	Categorize, create, devise, design, explain, organize, plan, arrange, reconstruct	The student integrates information from several sources to solve a specific problem or to answer a question.	Make sentences using the scrambled words.