"Top-down and bottom-up processing of knowledge in language learning"

Umarova Zaynura Tolibjon qizi
Tashkent State Pedagogical University named after Nizami
English teacher

Abstract: Top-down and bottom-up are well -known approaches in language learning as well as teaching. This article is aimed at focusing on particular features of these two processes and how scientists deal with teaching L2 for learners. Besides that, it covers similarities and differences of them, the ways that learners acquire knowledge effectively and provide some examples.

Keywords: Top-down process, bottom-up process, scientists' theories, special peculiarities of these two approaches, Bloom's taxonomy.

There are two types of processing in language learning: Top-down and Bottom-up. These two types differ from each other with their specific features and it comes in handy for learners to follow them, especially, in listening and reading. As for top-down processing of language, it mostly occurs whenever the learners use their prior knowledge to guess the meaning of the language when they are listening or reading something. Here, the learners develop their expectations about what they listen or read. This is one of the most effective way for learners which brings their last decisions to a certain type of situation. For example, in reading teachers ask learners to look only the title or first sentence of the article instead of the whole one and it gives a clue for them what the article is about. By the way, learners use their top-down processing on that article.

Comparing to top-down processing, bottom-up processing is considered a skill building process because, here, learners tend to understand language through looking at every detail of the text, like sounds in listening and words in reading. By the way they understand the whole text. This is often contrasted with top-down processing. For example, teachers ask learners to read any kind of text loudly and it makes them focus on only word forms rather than its meaning. In listening learners more depend on this approach as it helps them to write verb, noun or adjective forms of a word preceding or following the next word.

However, learners are encouraged to use both top-down and bottom-up processing as the former helps them to understand a text in reading comprehension whereas the latter helps them to analyze grammatical characteristics of the language in the text. The bottom-up processing does not require background knowledge or experience and it relies on learners' sensory information from external information. While top-down approach goes from the general to the specific, bottom-up approach begins with the specific and moves to the general. These two approaches are useful to analyze the text in reading and listening. Many scholars come up with different ideas on both top-down and bottom-up approaches. For example, the scientist John Field gave some elements of top-down and bottom-up approaches such as in foreign-language listening and reading, perceptual information is described as "bottom-up" approach, while information provided by context is said to be "top-down" approach. In cognitive psychology scientists distinguish processes that are data-driven and knowledge-driven.

In listening, the lowest level (the smallest unit) is the phonetic feature and it presents combining group of features into phonemes, phonemes into syllables, syllables into words and clauses into prepositions. Here, at the "top" is the overall meaning of the utterance that new information is integrated as it emerges. Many ELT commentators present a picture of listening and reading in which bottom-up information from signal is assembled step by step and is influenced by top-down information from context. According to some psychologists, they process speech into syllables without passing through a phonetic level; others construct words directly from phonetic features. Here, we can realize that bottom-up processing cannot deal with one level at a time. There is an evidence that in listening the task of analyzing the phonetic signal, identifying words and assembling sentences must be going on parallel. A quarter of a second is the length of an English syllable – so the learner often begins with the analyzing of a word before the speaker has finished saying it. Like "bottom-up" processing, "top-down" is more complex. Contextual information can come from

knowledge of the speaker/writer or from knowledge of the world; Goodman (1970) stated that, "Successful readers guess ahead using current context has not been conclusively demonstrated". Here, the scientist mentioned that top-down approach is useful for learners to guess what the text is about by headline or first sentence. According to Paran (1996), top-down processing also known as concept-driven model emphasizes on contextual factors such as socio-cultural knowledge and proceeds from whole to part. In other words, top-down approach happens when the learners activate their knowledge to facilitate comprehending the text. On the other hand, in bottom-up approach, the written or printed text is the center of attention and reading proceeds from part to the whole. Learners usually use their knowledge of lexical items, structural points and phonological patterns to decode the text meaning. "In bottom-up model, the reading process proceeds in serial fashion, from letter to sound, to words, to meaning" (Gough, 1972). Model of reading process which are called top-down and bottom-up try to explain and predict reading behavior. According to Arans & Byrnes (1991), a top-down model which focuses on the importance of background knowledge builds global comprehension while a bottom-up model which emphasizes the linguistic clues builds literal comprehension of a text.

 Furthermore, as Carrel and Eisterhold (1983) argue, "Knowledge of a minimum of 5000 words is essential to make top-down processing possible". In contrast, bottom-up models cannot be useful at the advanced language learners because students have the capability to decode graphical input automatically (Skudiene, 2002). Skudiene (2002) also emphasized that pre-reading and while-reading activities were based on top-down models while post – reading was interactive with bottom-up models.

"Reading comprehension is one of the linguistic skills which simultaneously mobilizes different representational levels and procedures" (Fayol, 2004, p.191). Bottom-up processing is based mainly on the smallest linguistic units of a text from which particular knowledge schemas are activated. In this view, the comprehension process starts with words (their pronunciation, semantic value, morphology), which later give access to more extensive units (syntagmas, sentences, paragraphs) and finally to interpreting the whole text. Top-down processing is opposite approach. Here, comprehension begins with more global aspects (the title, the basic idea of each paragraph) and subsequently goes into small linguistic units. This type of processing is particularly based on the prior knowledge the speaker has and in the communication situation. To understand a text, we first start the meaning of the paragraph (or chunk of text) and later turn to the sentences and words that make up the message. Reading is an interactive process including both top-down and bottom-up processing. "Both top-down and bottom-up models are integral parts of perception, problem-solving and comprehension" (Kintsch, 2006, p.126). Without sensory input (bottom-up) we could neither perceive, nor comprehend, nor think. However, perception, comprehension and thought would be equally impossible without a memory or knowledge component (top-down). Nothing happens without both. Here, we realize that both top-down and bottom-up perspectives form the basis of every study related to reading comprehension. "Bottom-up processing is processing which depends directly on external stimuli, whereas top- down processing is processing which is influenced expectations, stored knowledge, context and so on" (Eysenck, 1998, p.152).

"In bottom-up processing (also called data-driven), the process starts with small features of language to the top. Top-down processing (also called knowledge-driven) involves the use of contextual information supplied from memory" (Carlson et all., 2010, p.202). The top-down model of reading does not focus on what the reader brings to the process (Goodman & Smith, 1967). The reader samples the text for information and contrast it with their world knowledge. The focus here is on the readers as they interact with the text. To improve top-down skills teachers have their students use post-it notes to mark a text as they are reading. These notes could include key information, a new vocabulary item, interesting descriptions, or whatever focus seems appropriate. Here, post- reading activities take into account the six level of skills that Bloom suggests in his taxonomy. The first level is knowledge, which includes recall or recognition of information. The next is comprehension where the reader might explain, describe or rephrase a text. Others are application (where the reader applies the information learned in the text), analysis (where the reader would make inferences or derive generalization), synthesis (where the reader combines several ideas), evaluation (where the reader judges the value, importance of a text).

To sum up, both top-down and bottom-up approaches are vital for language learners to work with materials. While we start with syllable to word, word to sentence, sentence to the whole text (comprehension) in bottom-up model, the top-down model is vice versa as it starts from comprehension to sentence, sentence to word and

_____

word to syllable. All scientists I mentioned above contributed the same idea in language learning such as bottom-up processing relies on the small aspects of the language and top-down processing includes global aspects of language. Especially, in reading and listening they play a crucial role because language learners analyze every detail of listening handouts upon doing it, in reading they steps many levels like evaluating, analyzing, synthesis, application, comprehension and knowledge as Bloom mentioned in his taxonomy.

References:
1. Goodman, K.S. 1970.: 'Reading: A psycholinguistic guessing game' in H. Singer and R. B. Ruddell (eds.). Theoretical model and Processes of Reading. Neward, DE: International reading Association.
2. Lund, R.J. 1991: 'A comparison of second language listening and reading comprehension'. Modal Language Journal, p. 196-204.
3. www. Elsevier.es/psed.
4. Carlson, N.R., Miller, H., Heth, C.D., Donahoe, J. W., &Martin, G.N. (2010). Psychology: the science of behavior. Boston, MA: Allyn &Bacon (Pearson).
5. Caplan, D., & Waters, G. S. (1999). Verbal working memory capacity and language comprehension. Behavioral and brain science, 22, p. 114-126.
6. www. Sciencedirect.com
7. Goodman, K.S. (1967). Reading: a psycholinguistic guessing game. Journal of the Reading Specialists,6, p.126-135.

_____