



The impact of top-down VS bottom-up strategies on reading comprehension at SMK negeri 7 Pekanbaru

Salsabila¹, Ratmanida²

¹ English Department, Faculty of Language and Arts, Universitas Negeri Padang

Correspondence Email: salsabilaunp@gmail.com

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Abstract:

Reading comprehension is an essential skill for vocational high school students, as it supports academic achievement and enables students to understand English texts related to their future professional fields. However, many students still experience difficulties in comprehending English texts due to limited vocabulary mastery, low reading motivation, and the use of conventional teaching strategies that do not actively engage students in the reading process. This study aims to examine the effectiveness of top-down and bottom-up reading strategies in enhancing students' reading comprehension and to determine whether there is a significant difference in reading comprehension achievement between students taught using the two strategies. This research employed a quantitative approach using a quasi-experimental design with a pre-test and post-test non-equivalent group design. The population consisted of eleventh-grade students of SMK Negeri 7 Pekanbaru. Two intact classes were selected as the samples through purposive sampling. One class was assigned as Experimental Group 1 and was taught using the top-down reading strategy, while the other class was assigned as Experimental Group 2 and was taught using the bottom-up reading strategy. The research instrument was a 30-item multiple-choice reading comprehension test administered before and after the treatments. The data were analyzed using descriptive statistics and the Mann–Whitney U test. The findings revealed that both strategies improved students' reading comprehension; however, students taught using the top-down strategy achieved higher post-test scores than those taught using the bottom-up strategy. Therefore, the top-down strategy was more effective in enhancing students' reading comprehension.

Keywords:

Reading comprehension, top-down strategy, bottom-up strategy, quasi-experimental study, vocational high school

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1. INTRODUCTION AND LITERATURE REVIEW

One of the most important foundational skills in learning English for all students including SMK students is reading comprehension, a complex process that involves the ability to understand, interpret, and evaluate information from written text. Students of Vocational High School (SMK) must comprehend not only academic materials but also practical texts pertaining to the workplace and vocational skills in the SMK setting. According to Nanda and Azmy (2020, p. 13), empirical evidence indicates that the majority of students continue to struggle with comprehension of English reading. There are many problems actually faced by the students in comprehending texts, such as inadequate vocabulary and lack of reading enthusiasm. The other problem might be caused by the strategy or method used in teaching reading, which is one of the crucial factors affecting students in learning English reading skills.

In many cases, teachers still rely on conventional, teacher-centered methods that emphasize rote reading, grammar drills, and literal translation, which limit students' engagement with meaning-making processes (Grabe & Stoller, 2011, pp. 10-12). As a result, students often develop passive reading habits and lack the strategic tools needed to actively decode and interpret texts (Brown, 2001, pp. 299-300). This combination of outdated teaching strategies and limited student autonomy in reading contributes significantly to low reading comprehension outcomes. Therefore, it is important to explore the use of more structured and strategy-based approaches to develop students' reading comprehension. The use of top-down and bottom-up models, according to Goodman (1967, p. 127) and Amini et al. (2020, p. 18), can facilitate students' understanding of English texts.

One of the most possible strategies is the use of top-down and bottom-up strategies. A study by Lase et al. (2024) highlights the effectiveness of the top-down approach, where readers utilize their prior knowledge and experiences to interpret texts. This strategy enables readers to predict content, infer meanings, and comprehend the overall message, even when encountering unfamiliar vocabulary (Brown, 2001, p. 306). Such an approach is particularly beneficial in enhancing reading speed and overall comprehension, as it encourages readers to focus on meaning rather than decoding each word individually.

On the other hand, the bottom-up strategy focuses on recognizing things like sounds, word parts, grammar, and sentence structure to make sense of the text (Haniff & Heriyawati, 2024, p. 195). This strategy often includes exercises like recognizing sentence patterns, sounding out words, repeating readings, and answering questions based directly on the text (Amini et al., 2020, p. 18). The bottom-up strategy benefits learners by improving their attention to linguistic details, aiding beginners in decoding words, and building a strong foundation for understanding complex texts. This gradual process helps readers accurately recognize and interpret language elements, which is essential for effective reading comprehension.

In fact, studies on the use of top-down and bottom-up approaches have been explored previously by many researchers. One of them is Kakvand et al. (2022), who explored how combining top-down and bottom-up methods might enhance vocabulary learning and retention. Oliver and Young (2016) discovered that whereas top-down, context-based training improved reading fluency, it had no effect on students' understanding of the meaning of the text. Likewise, Lee and Yoon (2019) pointed out that although bottom-up approaches can help expand one's vocabulary, it is unknown how they affect more complex comprehension abilities like identifying key ideas, formulating conclusions, and comprehending paragraph coherence.

It is clear that studies above fully explored top-down and bottom-up in vocabulary. In other words, there is no study yet about the use of top-down and bottom-up specifically for comprehensive reading comprehension among vocational students.

Therefore, this study will specifically examine the impact of top-down and bottom-up strategies on comprehensive reading comprehension skills among vocational students at SMK Negeri 7 Pekanbaru. This study will employ a quasi-experimental design conducted in real classroom settings, providing practical and generalizable evidence of the strategies' effectiveness. It is expected to reflect actual classroom conditions at the SMK level, offering more reliable evidence of the impact of top-down and bottom-up reading strategies.

2. METHOD

This study employed a quasi-experimental design with a pre-test and post-test non-equivalent group design. The participants were 68 eleventh-grade students of SMKN 7 Pekanbaru, divided into a Top-Down group (35 students) and a Bottom-Up group (33 students). The instrument was a 30-item multiple-choice reading comprehension test. The validity was confirmed using Pearson Product Moment, and the reliability coefficient was 0.804, indicating high reliability. Both groups were given a pre-test, followed by eight treatment sessions using different strategies, and a post-test at the end of the study. Data were analyzed using descriptive statistics and the Mann-Whitney U test due to non-normal data distribution, with a significance level of 0.05.

3. RESULTS AND DISCUSSION

3.1 Research Finding

The research findings reveal the impact of top-down and bottom-up strategies on reading comprehension among Grade XI students at SMK Negeri 7 Pekanbaru. Data from pre-test and post-test scores (30-item multiple-choice test) were analyzed using descriptive statistics and Mann-Whitney U test due to non-normal distribution.

3.2 Descriptive Statistics

Pre-test results showed top-down group (n=35) had mean score 90.43 (SD=7.24), while bottom-up group (n=33) scored 62.58 (SD=21.96). Post-test means improved for both: top-down 92.54 (SD=5.77) and bottom-up 77.64 (SD=17.64).

Table 1. Descriptive statistics of pre-test and post-test scores

Group	N	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD
Top-down	35	90.43	7.24	92.54	5.77
Bottom-up	33	62.58	21.96	77.64	17.64

Both groups showed improvement, with bottom-up gaining more points (+15.06) from lower baseline, while top-down maintained high performance with reduced variability.

3.3 Tests Before Mann-Whitney U

Shapiro-Wilk test confirmed non-normal distribution: top-down (Sig.=0.000), bottom-up (Sig.=0.001). Levene's test showed homogeneity of variance (Sig.=0.056).

Table 2. Normality and homogeneity tests

Test	Group	Statistic	Df	Sig.
Shapiro-Wilk (Post)	Top-down	0.268	35	0.000
	Bottom-up	0.219	33	0.001
Levene's (Post-test)	Combined	3.784	66	0.056

3.4 Hypothesis Testing

Mann-Whitney U test results: $U=240.500$, $Z=-4.197$, $\text{Sig.}(2\text{-tailed})=0.000 < 0.05$, rejecting null hypothesis.

Table 3. Mann-Whitney U test results

Test Statistic	Value
Mann-Whitney U	240.500
Wilcoxon W	801.500
Z	-4.197
Asymp. Sig. (2-tailed)	0.000

Mean ranks: top-down (44.13) significantly higher than bottom-up (24.29).

3.5 Effectiveness of top-down strategy

Top-down group improved from pre-test mean 90.43 to post-test 92.54, demonstrating effectiveness in enhancing reading comprehension through prior knowledge activation and context prediction.

3.6 Effectiveness of bottom-up strategy

Bottom-up group showed substantial gain from 62.58 to 77.64, indicating the strategy's value for students with lower initial proficiency through systematic decoding.

3.7 Discussion

The findings of this study provide important insights into the effectiveness of top-down and bottom-up strategies in enhancing students' reading comprehension. Although both strategies contributed to improvement, the top-down strategy demonstrated greater effectiveness. This indicates that activating students' prior knowledge and encouraging them to interpret meaning from context plays a crucial role in comprehension.

The greater effectiveness of the top-down strategy can be explained by its focus on meaning-making rather than word-by-word decoding. When students connect the text with their background knowledge, they are able to understand the overall message more efficiently. This supports Goodman's (1967) view of reading as a "psycholinguistic guessing game," where readers actively construct meaning using prior knowledge and contextual clues. Therefore, this approach is particularly suitable for recount texts, which require understanding sequences of events and context.

These findings are also consistent with previous studies. Navaz and Hana (2025) reported that top-down strategies were more effective in improving reading comprehension and were positively received by students. Similarly, Nadea et al. (2021) found that top-down strategies were more effective for EFL learners when dealing with longer texts, while Aritonang (2018) confirmed their significant impact on students' reading achievement. The consistency of these findings suggests that the effectiveness of top-down strategies is not limited to a specific context but can be applied more broadly.

On the other hand, the bottom-up strategy also showed improvement, particularly for students with lower initial ability. This indicates that bottom-up processes remain important for developing basic reading skills such as vocabulary recognition and sentence structure understanding. Therefore, both strategies play complementary roles in reading instruction.

This study provides the insight that while both strategies are beneficial, the top-down strategy is more effective for improving overall reading comprehension, especially in vocational school contexts where students need to focus on meaning rather than only linguistic forms.

4. CONCLUSION

This quasi-experimental study examined the impact of top-down versus bottom-up reading strategies on Grade XI students' reading comprehension at SMK Negeri 7 Pekanbaru using recount texts.

Key findings directly answer the research questions:

1. Top-down strategy enhanced comprehension (pre-test $M=90.43 \rightarrow$ post-test $M=92.54$) [Research Question 1]
2. Bottom-up strategy improved scores (pre-test $M=62.58 \rightarrow$ post-test $M=77.64$) [Research Question 2]
3. Significant difference favoring top-down (Mann-Whitney $U=240.500$, $p=0.000$) [Research Question 3]

These results fill the literature gap identified in the introduction—no prior studies specifically compared these strategies for comprehensive SMK reading comprehension using recount texts.

Theoretical validation: Confirms Goodman (1967) top-down processing effectiveness through context and prior knowledge utilization, particularly suitable for vocational recount texts requiring event sequence comprehension.

Practical recommendations for SMK English teachers:

1. Prioritize top-down strategies (prediction, inference) for recount text instruction
2. Use bottom-up techniques as supplementary decoding support for lower-proficiency students
3. Integrate both approaches based on student needs and text complexity

Limitations: Non-equivalent intact classes and focus on single genre (recount texts).

Suggestions for future research: Examine strategy effectiveness across other vocational text genres and larger SMK samples.

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