Review of Word Generation

This paper reviews relevant literature about Word Generation, a "Tier-I discussion-based program for upper elementary and middle school students to improve their academic literacy and language" (Jones et al., 2019). This essay has four main sections, which are strategy background, supports for literacy, supports for classroom learning, and applications. The strategy background section gives an introduction to Word Generation and its origin and its targeted audience. The supports for literacy section reviews evidence showing Word Generation's positive impact on text comprehension and fluency. The supports for classroom learning section discusses how the strategy lessons the Matthew Effects and benefits multilingual learners. The applications section discusses limitations in research and practice.

Strategy Background

Word Generation was developed by Harvard University Professor Catherine Snow. It originated from a partnership between the Strategic Education Research Partnership (SERP) and the Boston Public Schools (BPS). A quasi-experimental study found a small but significant impact on target word learning when it was first implemented in BPS (Snow, Lawrence, & White, 2009, cited in Lawrence, Crosson, Pare´-Blagoev, & Snow, 2015).

Focusing on vocabulary intervention, the Word Generation program aims to familiarize students with unknown vocabulary and cultivate their "word consciousness", a "metacognitive understanding" of word structures. Targeted at middle school students, the intervention engages students in deep reading, comprehension, and critical thinking in four subjects including English Language Arts, Science, Mathematics, and the Social Sciences. (Cox, O' Brien, Walsh, & West, 2015)

Each week, students are explicitly taught five new non-domain-specific academic words that are frequently encountered in the academic texts. During the week in all four subjects, students participate in dilemma-focused discussions, which provide them with authentic situations where they read, talk, and write about the week's topic using the newly acquired words. (Lawrence, Crosson, Pare´-Blagoev, & Snow, 2015)

Previous studies show that Word Generation raises vocabulary levels of all students on average, including those who are qualified for special education and language-minority students, especially for English Language Learners (Kim, Hsin, & Snow, 2018).

Supports for Literacy

Text Comprehension

Higher-order comprehension, which requires applying analysis, synthesis, critique, and problem-solving to develop vocabulary, academic language, perspective-taking, and eventually reading comprehension, is the goal for any reading interventions for post-primary students. Higher-order comprehension, content knowledge, as well as student motivation and engagement are the underlying objectives of the Word Generation intervention. (Jones et al., 2019)

Lawrence et al. conducted a randomized controlled trial with 1,554 middle-grade students in 28 schools. The schools were located in two Northeast large urban districts with a large proportion of students who were eligible for free and reduced lunch. The participant schools were randomly assigned to treatment or control groups. The results showed that classroom discussions of the treatment group were of significantly higher ratings than that of the control group on average. Comparing to programs that focused intensely on vocabulary teaching, Word Generation had larger positive influences on discussion quality than on word acquisition.

However, high-quality academic discussion indeed provided supportive contexts for vocabulary learning. (Lawrence, Crosson, Pare´-Blagoev, & Snow, 2015)

Another randomized controlled trial conducted by Jones et al. had a sample of 7,752 fourth- to seventh-grade students in 25 schools in four districts from two northeastern states. The trial lasted for two years, during which 5,648 students from 25 schools participated in Year 1 of the study, and 5,317 students from 23 schools participated in Year 2. The study found that the Word Generation intervention had consistent effects on the curriculum-based assessment of academic vocabulary across both years of the randomized trial, and for both elementary and middle-school students. The effects were larger for those who were experienced with the program and those who were in classrooms with more exposure to the curriculum.

Fluency

According to Kuhn et al., fluency is a crucial component of reading comprehension, and two essential elements of fluent reading are automaticity and prosody. For the reason that individuals have a limited amount of attention available when conducting reading as a cognitive task, it is essential for students to effortlessly and automatically identify words. Generally, after encountering words three to eight times, students acquire them as sight-words, which take less attention to decode accurately. Prosody includes intonation, stress, tempo, and appropriate phrasing, which contribute to learners' engagement with text and nuance to their reading. Effective literacy programs build learning communities in the classroom to provide scaffolding to students via cooperative learning, and discussion exploring multiple perspectives. (Kuhn, Rasinski, & Young, 2019)

The Word Generation curriculum provides students multiple opportunities to practice their weekly academic vocabulary in both oral and written forms. Students apply the newly learned words in English, math, science, and social studies classes, where they engage in academic classroom discussions exploring different perspectives. During the week, the five explicitly taught academic words are embedded in their memory. More than just memorizing the words, students also uncover deeper meanings of the texts they read. Therefore, Word Generation promotes fluency.

Supports for Classroom Learning

Matthew Effects

Longitudinal studies show that the academic achievement gap between less-skilled students and their more skilled peers tend to grow wider if no appropriate interventions are implemented, which is known as the Matthew effect. Though most longitudinal studies focus on younger children, it is reasonable to believe that Matthew Effects may also be apparent in middle grades. Lawrence et al. conducted an unmatched quasi-experiment to see how the Word Generation curriculum affects students of different achievement levels. A sample of five treatment schools and four comparison schools included high achieving students without individualized educational programs (IEP), students with IEPs, and low achieving students with IEPs. The results showed that students with IEPs received as many benefits as students without IEPs from the Word Generation program. Rather than fading away, students' improvement resulted from the program lasted one year after the intervention, even those without IEPs still had advantages over the comparison students at the end of the program. (Lawrence, Rolland, Branum-Martin, & Snow, 2014)

In a quasi-experimental study carried out by Mokhtari and Velten, 72 students participated in the experiment to test if after-school small group intervention improves struggling sixth graders' reading achievement scores. Thirty-six participants were school-identified as needing reading assistance and 36 did not need reading assistance but attended another after-school instructional program. Results showed that the Word Generation curriculum was very effective in improving students' vocabulary knowledge and reading comprehension. Moreover, intervention students scored nearly the same on the post-intervention Group Reading Assessment & Diagnostic Evaluation test as the comparison students, indicating that Word Generation helped to close the gap between skilled and less-skilled readers. (Mokhtari & Velten, 2015)

Lawrence et al. conducted a randomized controlled trial with a sample of 8,382 students in 44 middle schools in three urban districts to investigate how Word Generation impacted the development of taught academic vocabulary. The results showed that the Word Generation intervention, though brief and only modestly supported, induced small but significant improvement on students' reading achievement scores and their word learning levels. Word Generation may improve students' levels more on academic taught words than on general academic vocabulary, however, the curriculum could attenuate the Matthew Effects in reading and vocabulary growth. (Lawrence, Francis, Paré-Blagoev, & Snow, 2017)

Multilingual Learners

There is a gap between English language learners (ELLs) and their non-ELL peers in course grades and standardized test scores. However, most ELLs receive English as a Second Language (ESL) interventions that separate them from their non-ELL peers both in physical locations and future learning opportunities. Therefore, Tier-I universal approaches are needed to

obtain equality between native speakers and ELLs. Word Generation as a Tier-I discussion-based program was found to positively influence both non-ELL and ELL students on taught academic vocabulary and social perspective positioning skills, each group having differential gains. Additionally, Word Generation improved ELLs' social perspective articulation and academic language in the second year of implementation. (Kim, Hsin, & Snow, 2018)

A longitudinal quasi-experimental study examining the subgroup of language-minority learners found Word Generation beneficial for language-minority students. Conducted by Lawrence et al., this study included students from English-speaking homes, proficient English speakers from language-minority homes, and limited English-proficiency students. The results showed that the treatment students had a larger improvement on target word knowledge during the instructional period than the comparison students on average. Word Generation worked best for English-proficient students from language-minority homes, followed by English-proficient students from English-speaking homes, while limited English-proficiency students did not receive as much gain as their peers during the experiment. However, the ineffective treatment results for limited English-proficiency students might have been affected by the other factors, for example, they were far below grade level, so the target words were too difficult for them. (Lawrence, Capotosto, Branum-Martin, White, & Snow, 2012)

Another study by Cox et al. using a mixed approach examined multilingual learners' word consciousness in Sydney schools. Comparing to monolingual students, multilingual students' process of achieving word consciousness is different and more complicated. The study found Word Generation effective in improving average student reading achievement scores by comparing pre-test and post-test results. Teachers reported in questionnaires and interviews that student writing also improved as a result of the intervention. For multilingual learners, Word

Generation may help them improve oral and written English skills. (Cox, O’ Brien, Walsh, & West, 2015)

Applications

There are, of course, limitations to the Word Generation research. Firstly, there is missing data that may influence the results of research. In Lawrence et al. (2015), scheduling problems in the participant schools negatively impacted the number of students taking both pre- and post-tests, and missing data also disabled researchers from controlling for individual demographic variables. Jones et al. (2019) could not represent the impact of Word Generation had it been fully implemented because of missing data resulted from student absences and student mobility in the participating high-poverty, urban schools.

Variations in implementing the program in different schools and other difficulties may also influence the results of research. Jones et al. referred to the unsuccessful program, Success for All, in which there were no positive impacts found, and the program was abandoned. The researchers found large variation in implementation within and across schools along with challenges that influenced implementation, including high-stakes testing, poverty-related risk for school failure among the student body, and high mobility rates among students and teachers, which may influence the effectiveness of the intervention. Other factors may have higher priorities than the Word Generation program, including test preparation and test administration, the simultaneous introduction of other programs, lack of time or venue for teachers to plan the cross-content area activities, which may also put constraints on the implementation of the intervention.

One limitation that may place doubt upon the validity of research results is the format of the assessment. According to Lawrence et al. (2017), multiple-choice questions were used to assess the words taught in the intervention, which examined relatively shallow word knowledge and failed to test students' understandings of the nuances of the words. Though multiple-choice tests are efficient and easy to administer, they may not fully present students' gain in the program. Lawrence et al. (2017) argue that open-ended assessments may better reflect students' learning and accord with the fundamental goal of Word Generation, that is, higher-order comprehension.

Qualitative research results in Cox et al. (2015) showed that students may feel frustrated and bored when repeating and revisiting vocabulary and topic areas in different subjects. Teachers also reported that some words were too difficult for struggling students (Cox, O' Brien, Walsh, & West, 2015). This calls for more local adaptions of the intervention curriculum.

Conclusion

Word Generation as an instructional strategy has been proved to be effective by many experimental and quasi-experimental studies. Rooted in academic vocabulary acquisition, this discussion-based curriculum aims to improve students' reading comprehension. Overall, Word Generation can significantly improve participants' text comprehension and fluency. It also helps to narrow the achievement gap between skilled and less-skilled readers to reduce Matthew Effects. Word Generation intervention is also especially beneficial for language-minority students and English language learners because it provides them opportunities to learn and make progress together with their non-language-minority peers.

Multiple constraints might influence the feasibility of the Word Generation curriculum, including scheduling issues, lack of time, and high mobility rates among students and teachers. However, after-school small group intervention appears to be effective (Mokhtari & Velten, 2015), suggesting that flexible and adapted Word Generation curriculums may still be effective in implementation.

References

Cox, R., O'Brien, K., Walsh, M., & West, H. (2015). Working with Multilingual Learners and Vocabulary Knowledge for Secondary Schools: Developing Word Consciousness. *English in Australia, 50*(1), 77-84. Retrieved from http://web.b.ebscohost.com.ezp-prod1.hul.harvard.edu/ehost/detail/detail?vid=0&sid=8b0c9c46-5e38-43f4-ac4f-8839f7255f0f%40pdc-v-sessmgr02&bdata=JnNpdGU9ZWhvc3QtbGl2ZSZzY29wZT1zaXRl#AN=103281797&db=eue

Jones, S. M., LaRusso, M., Kim, J., Kim, H., Selman, R., Uccelli, P., . . . Snow, C. (2019). Experimental Effects of Word Generation on Vocabulary, Academic Language, Perspective Taking, and Reading Comprehension in High-Poverty Schools. *Journal of Research on Educational Effectiveness, 12*(3), 448-483. Retrieved from https://www-tandfonline-com.ezp-prod1.hul.harvard.edu/doi/full/10.1080/19345747.2019.1615155

Kim, H., Hsin, L. B., & Snow, C. E. (2018). Reducing Academic Inequalities for English Language Learners: Variation in Experimental Effects of Word Generation in High-Poverty Schools. *International Journal of Bilingual Education and Bilingualism*, 1747-7522. Retrieved from https://www-tandfonline-com.ezp-prod1.hul.harvard.edu/doi/full/10.1080/13670050.2018.1535574

Kuhn, M., Rasinski, T. & Young, C. (2019). Best practices in fluency instruction. In L. M. Morrow & L. B. Gambrell (Eds.), Best practices in literacy instruction (6th ed., pp. 271-288). The Guilford Press.

Lawrence, J. F., Capotosto, L., Branum-Martin, L., White, C., & Snow, C. E. (2012). Language Proficiency, Home-Language Status, and English Vocabulary Development: A Longitudinal Follow-up of the Word Generation Program. *Bilingualism: Language and Cognition, 15*(3), 437–451. Retrieved from https://www-cambridge-org.ezp-prod1.hul.harvard.edu/core/journals/bilingualism-language-and-cognition/article/language-proficiency-homelanguage-status-and-english-vocabulary-development-a-longitudinal-followup-of-the-word-generation-program/10468384B2316B

Lawrence, J. F., Crosson, A. C., Pare´-Blagoev, E. J., & Snow, C. E. (2015). Word Generation Randomized Trial: Discussion Mediates the Impact of Program Treatment on Academic Word Learning. *American Educational Research Journal, 52*(4), 750–786. Retrieved from https://journals-sagepub-com.ezp-prod1.hul.harvard.edu/doi/full/10.3102/0002831215579485

Lawrence, J. F., Francis, D., Paré-Blagoev, J., & Snow, C. E. (2017). The Poor Get Richer: Heterogeneity in the Efficacy of a School-Level Intervention for Academic Language. *Journal of Research on Educational Effectiveness, 10*(4), 767-793. Retrieved from https://www-tandfonline-com.ezp-prod1.hul.harvard.edu/doi/full/10.1080/19345747.2016.1237596

Lawrence, J. F., Rolland, R. G., Branum-Martin, L., & Snow, C. E. (2014). Generating Vocabulary Knowledge for At-Risk Middle School Readers: Contrasting Program Effects and Growth Trajectories. *Journal of Education for Students Placed at Risk, 19*(2), 76-97. Retrieved from https://www-tandfonline-com.ezp-prod1.hul.harvard.edu/doi/full/10.1080/10824669.2014.958836

Mokhtari, K., & Velten, J. (2015). Strengthening Academic Vocabulary With Word Generation Helps Sixth-Grade Students Improve Reading Comprehension. *Middle Grades Research Journal, 10*(3), 23–42. Retrieved from https://search-proquest-com.ezp-prod1.hul.harvard.edu/docview/1786450341?accountid=11311&pq-origsite=primo