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Acquisition and Retention of Vocabulary Using Simplified Picture Word Inductive Model

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Capstone Project: An Action Research Project

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Abstract

This action research was guided by the researcher's interest in finding ways to use picture word inductive model (PWIM) to encourage more vocabulary retention in preschool. The research was conducted using two versions of a similar PWIM poster. Group A used a simplified PWIM poster with limited items on the poster while Group B was exposed to a typical PWIM poster with more items to identify. Both groups used the words they identified in their posters for the 4-week study. Participants were monitored weekly using assessments such as visual identification and word identification to check for retention. Research was done to determine if a less stimulating poster would yield higher vocabulary identification and retention.

Keywords: preschool, PWIM, vocabulary retention

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The average 18-month-old recognizes about 260 words, whereas preschool-aged children recognize between 1,000–10,000 words (Law et al., 2016). Vocabulary increases dramatically from ages 3–5. Vocabulary knowledge acquired in early childhood can broaden a child's opportunity to communicate with others and convey thoughts and ideas (Masrai, 2018). Those who enter preschool or kindergarten with a smaller vocabulary have been identified as struggling later with reading and school success in general. In their longitudinal study of Australian children, Christensen et al. (2014) stated the strongest predictor of low receptive vocabulary at age 8 was low receptive vocabulary at age 4. Thus, educators have been scrambling to find ways to help these students increase their vocabulary.

There are many methods of teaching vocabulary such as word walls, read-alouds, and games. The problem is many of these strategies have been developed for K–12 and have been developmentally inappropriate for preschool. Because the strategies have been developed without preschool in mind, preschool educators must adjust the strategies to meet the needs of their students (Calhoun, 1999). This current study intended to take a widely used strategy known as the picture word inductive model (PWIM) and simplify it to meet preschool needs. Simplification of the PWIM poster was achieved using a poster about one single item rather than a busy photo including many different things occurring all at once.

The intended outcome of this action research paper was to find out if simplifying a PWIM poster would affect retention of the new vocabulary and if participants could integrate said vocabulary into their long-term lexicon. The information gathered from this study will benefit students to help increase and retain vocabulary. The benefit for teachers is to streamline

PWIM to allow for more PWIM cycles. Therefore, the students will be exposed to more vocabulary with a strategy that will not overstimulate them.

The literature review information was acquired through the DeWitt Library at Northwestern College in Orange City, Iowa, and Google Scholar. Both sites were used to find peer-reviewed articles in academic journals. I focused on peer-reviewed academic journal articles published from 2013-2023. The articles focused on PWIM, preschool language acquisition, and strategies for improving vocabulary in preschool. Research also was done on vocabulary acquisition for English language learners (ELL). This allowed for a bigger research scope, including international articles. I was able to look at language development from many different approaches and strategies for English language acquisition.

Although PWIM promotes language acquisition in both typical and simplified posters, this study showed use of the simplified poster increased retention of identified vocabulary. At the end of this study, students demonstrated using a simplified PWIM poster increased their vocabulary by 10% over students who used a typical PWIM poster. The study consisted of a vigorous assessment of vocabulary completed by the students every other week for 4 weeks. The students were shown the poster without the vocabulary on it and asked individually to identify the vocabulary that was previously identified. Students were also shown two different pictures of each vocabulary word and asked to identify them.

Review of the Literature

The literature review for this paper is organized according to themes using PWIM instruction in several ways. PWIM is used as a language development tool for K–12 ELL students as a secondary language support. PWIM is used for vocabulary development with students with delayed vocabulary for interventions and auditory word recognition. PWIM is used

as a language development tool during the preschool years as a support for vocabulary acquisition. I also looked for articles that included PWIM as a part of language/vocabulary development in any educational setting such as preschool, elementary, middle school, or high school.

International Uses of PWIM

As part of the research for this paper, I wanted to see what was being done in other countries with PWIM. I wanted to know if they PWIM as it is used in the United States. Upon closer inspection, I found yes, PWIM use in other countries was remarkably similar to use in the United States. It has been used to increase vocabulary both in native languages and foreign languages. It has beenused in all grades, lower, middle, and upper levels. Many countries, including the United States, have used PWIM widely as a support in the learning of a second language (Gu & Lornklang, 2021).

Internationally, specifically in Asia, not many studies have explored PWIM in the regular classroom. However, PWIM found a foothold in Asian communities, being used to reinforce English learning from kindergarten to high school. In some schools, it has been used to reinforce English learning and vocabulary, but also to teach cultural awareness. In recent years, Thailand has experienced a huge influx of Chinese tourism. The schools in Thailand have started to handle this situation by introducing Chinese culture through PWIM. The subjects introduced via PWIM to the Thailand students were Chinese New Year, Chinese hot pot, and Chinese dumplings (Zhao & Lornklang, 2019). Vocabularies touched on food, decorations, and festival activities that were typical experiences for those of the Chinese Culture. The development of the vocabulary and knowledge of Chinese Culture was effective and successful (Zhao & Lornklang, 2019). The PWIM photos and videos that the students were exposed to helped to build connections that the

students were able to use to compare and contrast with their own experiences with the Chinese culture to which they were being exposed.

English has been considered lingua franca (Gu & Lornklang, 2021) for most of the world. In 2001, China determined English was a compulsory course starting in Grade 3 (Gu & Lornklang, 2021). This decision made China the largest population of English learners and users; in 2016, approximately 440 million people in China were English-learning and English-using (Jiang, 2016). Since 2008, Thailand students have been required to study English from Grade 1–Grade 12 (Zhao & Lornklang, 2019).

Furthermore, in Malaysia, it is well known that English language acquisition is important. Beginning in 2011, the Malaysian government initiated and implemented education reform regarding English language acquisition and they have been unsuccessful (Lee et al., 2019). Malaysian graduates have been found repeatedly as unemployable due to their inferior proficiency in English. The government has continued to look for a way to improve instruction for Malaysians so that they may have a better command of the English language, thereby making Malaysians more employable (Lee et al., 2019). In all of these countries, the method used to instruct English has not been connecting with the students.

Vocabulary is defined as the entire stock of words belonging to a branch of knowledge or known by an individual (Zhao & Lornklang, 2019). Lack of sufficient vocabulary causes difficulty for learners to express, comprehend, and communicate (Zhao & Lornklang, 2019). In a study by Lee et al. (2019), vocabulary was examined by comparing Malaysian students' English vocabulary scores before and after the use of the PWIM. Sixty Malaysian Year 1 students were divided into two groups of 30. The study had a PWIM poster (i.e., a picture extracted and enlarged) for shaking out items in the picture identified and then written out with a line attached

to the word. Using the word list from the Dokumen Standard Kurikulum dan Pentaksiran Bahasa Inggeris (Ramli et al. 2019), a national curriculum for teaching English in lower, middle, and upper school, a list of words was generated to be taught during the study.

Students' vocabulary acquisition was statistically the same at the beginning of the study with a minor difference of .13 between the low and high groups of recognizable vocabulary (Lee et al., 2019). At the end of the study, the difference had changed to a statistically significant difference resulting in a change of 2.56 between the high and low groups in vocabulary knowledge recall (Lee et al., 2019). These scores showed PWIM was effective in improving vocabulary.

Zhao and Lornkland (2019) did a similar study in Thailand using PWIM to increase English vocabulary; however, there was a second part of the study the PWIM posters used in this study depicted things important in Chinese culture (e.g., Chinese New Year, Chinese hot pot, and Chinese dumplings; Zhao & Lornklang, 2019). The subjects of this study were 30 sixth graders who were shown PWIM posters of the topics. In the pretest scores, the highest score was 30 points and the lowest was 14. In the posttest scores, the highest was 40 points while the lowest was 21. By using the PWIM model, language acquisition was increased (Zhao & Lornklang, 2019).

An important part of learning is keeping students engaged. In China, two studies were done in different situations to check to see if students received PWIM well and what their opinions were regarding the use of PWIM in the classroom. Gu and Lornklang (2021) looked at English as a foreign language among fifth-grade students doing readers theater in English. Jiang (2018) used fourth-grade and seventh-grade students in a typical classroom. Both studies used

typical PWIM posters to introduce English words. Neither group had been exposed to PWIM previously and had only used textbooks and flashcards to learn English vocabulary.

In the Gu and Lornklang's (2021) study, 34 Chinese students in the fifth grade were looked at during the 1st semester of the academic year of 2020 to participate in the study. They were given a pretest and a posttest regarding the vocabulary that would be introduced in a typical PWIM cycle. The cycle lasted 6 weeks. Then, a questionnaire was given to each student asking about their thoughts on the PWIM cycle. In the posttest, Gu and Lornklang found that all students significantly improved their vocabulary. In addition, all students agreed that using PWIM effectively improved their English. The students were highly satisfied with the use of the PWIM posters and reported that the use of PWIM was interesting, practical, and effective as opposed to using the previous flashcard system with one picture, one word (Gu & Lornklang, 2021).

The students in Jiang's (2018) study found that the pictures were easy to identify with, while pictures in a textbook were "a little interesting, and boring with the same style" (pp. 72–73). Most of the students found that they learned, memorized, and retrieved previously learned and newly learned words more quickly, easily, conveniently, and efficiently (Jiang, 2018). The students who participated in the study all had their English vocabulary increase. The negatives results students listed were elements that had little to do with the actual PWIM poster, instead they were about the environment in which the PWIM presentation was taking place. The location was in a classroom of 60 students; the environment made it hard to hear clearly as it was a noisy classroom without order. The post was too far to see clearly, and there was unorganized handwriting on the PWIM sheets.

Impact of Low Vocabulary and Srategies for Improvement

Aggression has been defined as a kind of behavior that aims to harm and hurt oneself or another person who does not want to harm anyone or anything (Ersan, 2020). Early childhood is a time when a child's language develops rapidly but has yet to reach a level where it can be easily used to convey most thoughts and emotions. This can result in the form of physical aggression. From a developmental perspective, it is known that human (i.e, physical) aggression increases in the first 3 years of life and tends to decrease during one's fourth year (Ersan, 2020).

When children participate in a preschool environment, they are exposed to many things that may not have been experienced yet. What has been a child's normal for most of their life can suddenly be challenged. Children are being exposed to ideas and thoughts about what a family is, what kinds of behavior are acceptable, different rules, and routines for the first time. This can be a time of great turmoil in a young child's life. During these times, aggressive tendencies emerge in young children. Without the vocabulary to address these changes and communicate their feelings, thoughts, and concerns young children can turn to physical aggression.

Words are used to communicate ideas. The more words one owns, the better they can communicate; the better they are at acquiring words, the more control they have over their own educational (and emotional) progress (Calhoun, 1999). When a child has the vocabulary to address these issues, less physical aggression or physical solutions take place. When a child has a lower vocabulary, they tend to show more aggression.

Frequency of and increased aggression have become a matter of concern. Researchers have emphasized an alarming increase in the number of preschool children who are referred to clinics because they are diagnosed with aggression and parents, teachers, and psychiatrists worry about child aggression as one of the most destructive behaviors (Ersan, 2020). Ersan (2020)

examined the relationships between language development and aggressive behaviors of preschool children. There was a negative and significant difference between receptive (i.e., how language is understood) and expressive language (i.e., use of words to express oneself) regarding physical aggression. On the positive side, it was found that as language skills increased, the likelihood of applying physical aggression decreased (Ersan, 2020).

Development of language skills have also been looked at to see if low vocabulary in the preschool years has long-term consequences. Christensen et al. (2014) did a long-term study to see if low vocabulary in the preschool years had an impact on students later in life. First, participant's language skills were assessed at age 4, then those same participants had their language assessed at age 8. It was found that the strongest predictor of low receptive vocabulary at age 8 was low receptive vocabulary at age 4. Christensen et al. noted those with language impairments were included in the study and these participants were not always identified early enough to have an accurate assessment during it. Not all these children were given proper services long enough to make a difference in their ability to catch up to their peers. However, it should be noted once children start formal schooling, vocabulary does develop; during the primary (elementary) school years, the introduction of learning to read and write becomes a catapult for a vocabulary explosion. Although children's oral language skills from ages 5–8 are similar to an adult, the amount of vocabulary continues to grow throughout a lifetime. If there is a restriction on vocabulary development during these early years, it can delay language abilities for many years unless interventions are used.

Another factor that should be considered is peer interactions in language development. Washington-Nortey et al. (2020) focused on this concept in their study. ELLs usually enter school with a low English vocabulary, making them at risk for the same issues seen among

English students with a low vocabulary. Classrooms with English students who have high vocabulary can result in ELLs with low vocabulary making huge gains during the school year. Peer interactions are more common than child–adult interactions in the classroom (Washington-Nortey et al., 2020). Using the AbstrackR program, all participants in Washington-Nortey et al.'s study were screened on academic readiness, English language learning, English and Spanish language outcomes, reading aloud to peers, English vocabulary, and English letter word skills. It was found that in classrooms with a bigger percentage of English speakers, the ELL students were put in a position to make stronger gains than children in settings with equally skilled same language peers (Washington-Nortey et al., 2020).

Although putting ELL students in the same classroom as students whose native language is English can increase vocabulary, vocabularry still needs to be taught to these students in school. Many learners who are ELL students are attending schools where the language of learning and teaching is English. In addition to the challenge that the regular curriculum provides, the opportunity to listen and have relaxed conversation in English with their peers is a benefit that cannot be provided by the curriculum. By having social interaction with their peers in conversational English, the confidence of ELL students increases. Social interaction can be an important support in learning a new language. Teachers need to employ different strategies to ensure these learners become literate in the language and learning of their schools.

In their paper "Exploring Strategies Teachers Use to Develop Literacy Skills among English First Additional Language Learners in the Foundational Phase," Venketsamy and Sibanda (2021) explored different strategies as ways to improve ELL vocabulary. Some of the strategies discussed to increase vocabulary were using play as a method of teaching new vocabulary, thematic units, and problem-based learning. By using different methods of teaching,

the same information or cross-subject teaching vocabulary is reinforced without it being a "lesson" and is more likely to become a part of a child's lexicon. Another way that is readily introduced into the typical classroom is the reading of child-appropriate storybooks. Although this strategy fits easily into the classroom routine, it is also easily done within the home and can be an ongoing shared responsibility between home and school. This approach alleviated the entire responsibility on home or school and allowing for home involvement. By using both home and school, the cost is cut for families to continually provide new material and the school can monitor improvement made by the extra work done in the home. Although this approach is not an ideal situation for some due to different home situations, it allows for a large amount of time to be used in the introduction and continued usage of new vocabulary.

Vocabulary Development

In Hilbert and Eis's (2013) study, they stated that academic success includes many factors; one of those factors is emergent literacy skills which include phonological awareness, vocabulary, letter naming, and word manipulation. Children who begin their kindergarten year with a delay in emergent literacy skills are likely to continue to be delayed as compared to typically developing peers. Kelley et al. (2020) agreed with this finding in their study. Some of their findings showed children with limited language skills who enter preschool and kindergarten are at a higher risk of later learning failure and diagnosis with reading disability and children with limited vocabulary knowledge are likely to have comprehension deficits.

The recognition of early intervention in language development is important. If educators can implement successful early interventions, it can make an enormous difference in a student's ability for comprehension, and oral language skills. In Vuattoux et al.'s (2013) study, two groups of preschoolers were observed in the classroom setting. One group read a book to students

without soliciting participation. In the second group, educators stimulated children's participation and interest by asking them questions about the story and encouraging them to also ask questions. Participation was found to be key and was associated with greater vocabulary gains. The results of the study suggested participation is necessary but not sufficient to ensure learning. By engaging children in a PWIM cycle, the children participate to "shake" out words and identifying what words to use. Having this engagement is a way to not only increase vocabulary but also reinforce the use of it in the classroom by always making the words available to the students.

In Vygotsky's zone of proximal development, the space between what a child has mastered and can do without help and what a child can do with support or scaffolding from others, including adults and peers, supports the idea that children being around others with a larger, more robust vocabulary can increase the lower vocabulary child's vocabulary (Simple Psychology,2024). Keeping this fact in mind, the opportunity to participate in PWIM with children of varying abilities is a positive intervention for increasing vocabulary. Schmitt et al. (2022) found that children who demonstrated poor language skills and ELL children benefitted from learning in classrooms composed of children with stronger language abilities. Schmitt et al. also found during interventions by speech-language pathologists, having children of mixed language abilities participate together in activities had a greater impact than those who only did solo interventions or with peers of the same abilities.

Early Childhood Language Development

Language plays a vital role in children's sociobehavioral and school development. As children attend and progress through school, it is important to focus on children's early education environment. The time spent in an educational environment can identify weaknesses and

strengths in the development of language, allowing for early intervention. It is an opportunity to improve language development as it can have a lasting effect on future internal and external problems as well as academic problems (Spilt et al., 2015).

Something that can influence the developing language during this early time is relationships, specifically, student–teacher relationships. Close relationships between students and teachers promote language skills but also increase young students' receptive language skills. In the early grade school years, this has a snowball effect. Developing receptive language skills is needed to engage in more sophisticated and extended conversations with teachers, which in turn appears to contribute to the development of a close and affectionate relationship. Which then has a positive effect on subsequent growth in receptive language (Spilt et al., 2015). This provides a positive experience between children and teachers that can have an upward momentum that continues through school. Not only does this relationship provide positive language experiences, but as a side effect, it can increase a child's positive overall feelings for school that can follow them through their entire academic career.

Early interventions in the preschool years can have lasting effects on a child throughout their entire life. Johanson et al. (2015) looked at the connection between preschool and kindergarten regarding language development. Providing a boost in language and literacy skills during this time can alter the language trajectory of children. Some of the "boosts" that are seen in the preschool classroom are linguistically rich conversations where teachers model vocabulary and diverse types of linguistic forms (i.e., meaningful parts of speech such as sentences, words, and phrases), interactive read-alouds, and vocabulary games (Baker et al., 2016).

Although teachers in later grades use PWIM to increase vocabulary, it is also used to support community learning and writing in both upper and lower grades. Using community

learning in early childhood supports those whose vocabulary development is lower than is typically seen in the preschool classroom. PWIM brings beginning reading, writing, phonetic analysis, and spelling to the forefront of the classroom. During their regular day-to-day experience, children are exposed to specific vocabularies that their peers in their experience to which they may or may not have been exposed. This brings a huge amount of vocabulary that can be shared through the PWIM experience. By having the physical poster in the room, it empowers young students to take their learning into their own hands through this visual representation the students can refer to the shared vocabulary.

PWIM assists in furthering language due to the simple focus on vocabulary and writing. Pionera et al. (2020) discussed how PWIM could help students learn together in a group and share what they have learned to achieve success for the group. As emergent writing appears in the preschool classroom, PWIM is an excellent tool to help the child to feel confident in his/her writing and can give meaning to their writing. It also allows ownership of the writing. This prompts children to find their letters in the everyday print that they see around them. When a child sees a letter in their name and then makes the association that the letter also appears in other words, they can begin to make connections from letters to words. Pionera et al. said a student's writing skills should be considered in achieving fluency because the correct writing certainly contains the correct vocabulary so the meaning of the choice of words can be understood.

Researchers have agreed that increasing vocabulary, especially for ELL students or students with an unusually low vocabulary, is beneficial. Vocabulary not only affects their immediate educational careers but also impacts their entire education and lives. Vocabulary not only affects childrens their lives but also the lives of those around them. For example, as ELL

students' vocabulary increases, their families can have similar exposure by hearing their students use the language when they are having conversations with others around them or even translating for their families.

Methodology

Research Question

In a typical PWIM cycle, a picture or poster with many identifiable items is presented to a group, and the participants of the group then identify items in the poster. Participants then become more familiar with the words by using them in the classroom through word and picture identification, guided writing, and independent writing. One may wonder if a simplified poster (i.e., a poster with fewer items to identify) would help participants focus more fully on a few items so they could add those words more successfully to their long-term lexicon rather than being distracted by the many items in the poster. By using both a control and an experimental group to check vocabulary retention on different PWIM posters, the results would show if there is an obvious difference between the two groups.

Research Site

This research took place at Davis County Community Schools in southeastern Iowa. The school district covered most of Davis County, specifically the towns of Bloomfield, Drakesville, Floris, and the surrounding rural area. The school had 1,293 students in preK–12 (Data USA, n.d.). The school had a lower socioeconomic status with 42.9% of the students receiving free or reduced lunch (Niche, n.d.). The preK program at Davis County Community Schools during the 2023–2024 school year had three general education classrooms. Each classroom had an average of 14 students.

Participants

The participants all came from the same preK classroom. Initially, 15 students (all members of the classroom) were extended an invitation to participate in the study. Thirteen participated in the study, and one moved away during that time. All students were enrolled in the statewide voluntary preschool program for 4-year-old children. They were aged 4–5 in the 2023–2024 school year. The study consisted of four girls and eight boys.

The participants' families were sent questionnaires regarding education and household income. They reported 30% of families had a parent with higher education (i.e/, associate, bachelor, or master's degree) and 25% of families reported having a parent who did not complete high school. Reported household income showed 10% of families made below $20,000 per year and 30% of families made above $50,000 (see Appendix A, B, C).

Intervention and Timeline

In the first week, the separate groups looked at different posters. At that time, they identified items they knew in the picture. For the next 3 weeks, students were exposed to the poster daily through activities such as writing the words on a blank poster that was identical to the poster they originally had labeled and hearing the words in the classroom read classroom read-aloud. They were also shown pictures of a variety of items of the same name. For example, they identified a steering wheel and then they were shown several types of steering wheels that were easily identified as steering wheels but of a different shape or color. The vocabulary words were also put on word strips and placed in an area that the students had continual access to so they could write the words when they wanted. In addition to these opportunities, the students interacted with the vocabulary during weekly assessments of flashcards and picture–word identification.

Variables

Students were placed in groups by randomly drawing names to determine placement. There were two groups—Groups A and B—and both groups had six participants in each. Group A (independent variable) had a simplified poster that focused on one child swinging on a swing, while Group B (dependent variable) had a poster of several students playing on a playground. Students were shown these posters in their groups and asked to identify what they saw. For example, they shared, “I see a slide.” The poster was then labeled and displayed with the vocabulary that the children identified. Both groups did the same interventions with their group’s identified vocabulary.

Measurement Tools

The initial data were collected in a simple point system. Both groups used the same point system. One person collected all the data for consistency. Data collection took place over 3 weeks. In the first week of data collection, participants were given a printout of their respective posters and a word bank. When participants correctly placed a word, they were given a point. During the second week of data collection, participants were shown flashcards with different pictures of the items identified on the posters (e.g., a yellow slide or a blue twisty slide). The third week of data collection used the same flashcard. The reliability of this type of data collection was easy to reproduce with a simple point system. The validity of one point per correct word identification was also easy to reproduce. All the personal data collected and the data collected from the assessments, which consisted of blank PWIM posters with word banks and flashcards, were kept in a locked file cabinet.

Anticipated Statistical Analysis

I anticipated the statistical analysis would show that by using a simplified PWIM poster, participants would be able to retain and incorporate more vocabulary words than the typical PWIM poster participants. During the blank poster fill-in worksheet, I anticipated that participants would have similar scores. As the period of the data collection continued using the flashcard portion of data collection, I anticipated that the simplified poster participants would be able to make larger gains in vocabulary retention.

Institutional Review Board

For this action research study, I submitted and was approved for an institutional review board for human subjects research exemption from Northwestern College, Orange City, Iowa. This action research study examined whether simplifying a PWIM poster would affect retention of the new vocabulary and if participants would be able to integrate said vocabulary into their long-term lexicon. To make sure all anonymity were kept, all information and data concerning this study were kept confidential by only referring to the subjects by number. The hardcopy information was kept in a locked file cabinet.

Data Collection

The data collection for this paper was quantitative. A point system was used for both the blank PWIM posters the participants completed and the flashcards. One point for each correct answer was given. The data were collected during the actual assessments for each group. During the collection, the data points were marked on a tally sheet immediately as the one-on-one assessments were taking place.

Consent forms were sent to the homes of all 15 students in the classroom, asking for consent for their children to participate in the study. Thirteen students' families responded

positively and signed the consent form. During the time of the study, one student moved awa, which resulted in data collection for 12 participants. After consent was received, a questionnaire was sent to the families of the participants asking for background information on the families. The questionnaire covered family size, parental/guardian opinion on the level of the participants' vocabulary ability, access to literature, the frequency that participants were exposed to literature in the home, parental educational levels, and household income. This background information helped give a fuller view of the participants. The answers from the questionnaire did not have a bearing on the results of the PWIM data collected.

Data Analysis

Initially, all participants in the preK classroom were given the opportunity to participate in the study. Permission letters were sent home to all students. All students participated in the classroom PWIM posters; however, data for this study were collected on only the participants who returned the signed permission forms. When the data collection was completed and all of the questionnaires was returned, the data were compiled. Then, data were sorted into appropriate charts and graphs for the best understanding of the question: will simplifying a PWIM poster affect retention of the new vocabulary, and will participants be able to integrate said vocabulary into their long-term lexicon?

An independent *t*-test was used to analyze the data for this action research paper. The independent *t*-test was used to test the difference between two independent population means and assumed (a) the two population means consisted of different test subjects and (b) the dependent variable was measured on a continuous scale. Population $\mu 1$ represented students who initially studied a simplified PWIM chart. Population $\mu 2$ represented students who initially studied a typical PWIM chart. The null hypothesis was there is no significant statistical difference between

the two populations (H0: **μ**1 = **μ**2). The alternative hypothesis was there is a significant statistical difference between the two populations (H1: **μ**1 ≠ **μ**2). For each population, I calculated the sample size (n), mean (M), variance (S), and the calculated t-value (t; see Figure 1).

Figure 1

Two-Tailed T-Table Statistical Variance Equation

$$t = \frac{M_1 - M_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

Note. A two-tailed test, in statistics, is a method in which the critical area of a distribution is two-sided and tests whether a sample is greater than or less than a certain range of values. It is used in null hypothesis testing and testing for statistical significance. If the sample being tested falls into either of the critical areas, the alternative hypothesis is accepted instead of the null hypothesis (Hayes, 2024).

In this study's case, both populations **μ**1 and **μ**2 had sample size of six. Tables 1 and 2 lists the sample data as well as the means, variances, and *t*-values. The calculated *t*-values all fell between 0.29 and 1.05. The initial number of words identified by Group A had a mean of three and Group B had a mean of two, reflecting a 50% increase. These collected data appeared consistent with classroom observations and anecdotal evidence that had been the initial cause for the H1 hypothesis which stated a simplified PWIM poster will improve retention of new

vocabulary and the participants will be able to transfer the vocabulary into their long-term lexicon.

Table 1

Data Collection of Vocabulary Growth Data Group A (Total Seven Words)

Participants	Words identified	Percentage	Follow up 1	Percentage	Follow up 2	Percentage
Participant 1	4	57.14	5	71.43	6	85.71
Participant 2	2	28.57	5	71.43	5	71.43
Participant 3	5	71.43	7	100.00	7	100.00
Participant 4	0	0.00	3	42.86	4	57.14
Participant 5	1	14.29	3	42.86	3	42.86
Participant 6	6	85.71	7	100.00	7	100.00
Mean	3	42.86	5	71.43	5.33	76.19
Variance	4.67	0.10	2.67	0.05	2.22	0.50
Independent *t*-test	0.68	1.05	0.68	1.05	0.30	0.70

Note. Degrees of Freedom: 6+6-2 = 10. Proportion: 0.05. Critical *t*-value (from table based on *df* and *p*). If *t*-value is greater than critical *t*-value than reject null hypothesis. It was not for any cases; therefore, except null hypothesis (i.e. the difference of results between the two), groups were not statistically significant.

Table 2

Data Collection of Vocabulary Growth Data Group B (Total Nine Words)

Group B Participants	Words identified	Percentage	Follow up 1	Percentage	Follow up 2	Percentage
Participant 7	0	0.00	0	0.00	0	0.00
Participant 8	3	33.33	5	55.56	7	77.78
Participant 9	1	11.11	3	33.33	6	66.67
Participant 10	4	44.44	6	66.67	6	66.67
Participant 11	1	11.11	2	22.22	3	33.33
Participant 12	3	33.33	4	44.44	5	55.56
Mean	2	22.22	3.33	37.04	4.5	50.00
Variance	2.000	0.025	3.889	0.048	5.583	0.069
Independent *t*-test	0.68	1.047	0.68	1.05	0.29	0.70

Note. Degrees of freedom: 6+6-2 = 10, Proportion: 0.05, Critical *t*-value (from table based on *df* and *p*). If *t*-value is greater than critical *t*-value then reject null hypothesis. It was not for any cases. Therefore, except null hypothesis (i.e. the difference of results between the two), groups were not statistically significant.

Upon collecting further data, I observed that follow-up analysis for retention scores showed either vocabulary growth or was constant for all students, independent of group placement. No participant in either group saw vocabulary retention decrease at any point during follow-up data collection. Total vocabulary growth was observed to be higher in Group A, with final data collection indicating Group A's vocabulary increased at 5.333 words compared to Group B's 4.5 increase in words. In contrast, the rate of growth for Group B was noted to be higher, increasing from an initial mean of two words to a second follow-up result of a mean 4.5 words regarding vocabulary increase, indicating a 250% increase from initial testing to the time of the second follow-up.

Group A's rate of growth from the initial mean of 3 for vocabulary words identified to the final 5.333 words indicated only a 77.78% increase over the course of the experiment and data collection. This result showed higher total growth in Group A, but higher rate of growth in Group B, with diminished differences in the final results. This result could indicate a converging of results where both groups become normalized at the same final results, or could be indicative of a trend where rate of growth would eventually cause Group B to surpass Group A. Future results beyond the second follow-up have not been measured and further data collection for retention would be needed to establish long-term effects for higher learning and retention.

Student 7's testing showed null results across all testing and data collection both initially and in follow-ups. This level of participation was inconsistent with all other participants regardless of whether they participated in Group A or Group B. To rule out the possibility of outlier data as an anomaly that would skew the results of the data collection, Group B's data mean and variance were reexamined in consideration as a group with a sample size of five. Student 7's results were eliminated and Group B's statistics were recalculated using the data collected only from Students 8–12.

If Group B were recalculated with a sample size of five and the contributions of Participant 7 were removed as an outlier, final mean retention rate in Group B was factored at 5.4, indicating that Group B actually observed higher learning and retention than Group A, although by an amount negligible enough that it fell below the critical t-value, yielding the same H0 null hypothesis confirmation observed previously when factoring the inclusion of student seven. Having ruled out the possibility that Participant 7's level of participation would skew the data toward inappropriate findings, the decision was made to retain Participant 7's participation in the data collection and results so the final testing represented the most accurate participant sample across all learning levels.

To test the hypothesis, these calculated t-values had to be compared to critical t-values. To determine these, I calculated the degrees of freedom (*df*) in this experiment and selected an appropriate alpha level (α). The degrees of freedom were calculated using the following equations:

- $df = n1 + n2 - 2$
- $df = 6 + 6 - 2 = 10$

For α, I selected the standard 0.05 for statistical tests, although it is noteworthy to share the results would not be different even for values as high as 0.30. It is important to note that even if the value did increase liberally (i.e, .30), there was not a good enough connection between any of the numbers to show a statistical connection. Table 3 shows the degrees of freedom and alpha levels to find the critical *t*-value for this two-tailed test was 2.228.

Table 3

T Score Table

Cum. prob	t .50	t .75	t .80	t .85	t .90	t .95	t .975	t .99	t .995	t .999	t .9995
One-tail	0.50	0.25	0.20	.015	0.10	0.05	0.025	0.01	0.005	0.001	0.0005
Two-tail	1.00	0.50	0.40	0.30	0.20	0.10	0.05	0.02	0.01	0.002	0.001
df											
1	0.000	1.000	1.376	1.963	3.078	6.314	12.71	31.82	63.66	318.31	636.62
2	0.000	0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	22.327	31.599
3	0.000	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	10.215	12.924
4	0.000	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	7.173	8.610
5	0.000	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	5.893	6.869
6	0.000	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.208	5.959
7	0.000	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	4.785	5.408
8	0.000	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	4.501	5.041
9	0.000	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.297	4.781
10	0.000	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.144	4.587
11	0.000	0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106	4.025	4.437
12	0.000	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	3.930	4.318
13	0.000	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	3.852	4.221
14	0.000	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	3.787	4.140
15	0.000	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	3.733	4.073
16	0.000	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	3.686	4.015
17	0.000	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.646	3.965
18	0.000	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.610	3.922
19	0.000	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.579	3.883
20	0.000	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.552	3.850

Therefore, because all of the calculated *t*-values fell below the critical *t*-value, two populations were not statistically significantly different. Therefore, H1 was rejected: there was a significant increase in vocabulary and retention in use of a simplified PWIM poster. And Hypothesis H0 was accepted: there was no significant difference in vocabulary learning and

retention between the traditional PWIM poster and a simplified poster. The initial use of a simplified PWIM did not change results compared to the use of a typical PWM to a statistically significant degree.

Discussion

Jim Rohn said, “Vocabulary enables us to interpret and to express. If you have a limited vocabulary, you will also have a limited vision and a limited future” (A-Z Quotes, n.d.). The purpose of this action research paper was to determine if vocabulary would increase more with a simplified or a typical PWIM poster cycle. In the early childhood classroom and in life, increasing vocabulary is extremely important because it helps students to be able to express their feelings and navigate life and disagreements through words rather than solving issues physically.

Findings

During this study, Group A (simplified PWIM) increased their vocabulary by an average of 2.3 words while Group B (typical PWIM) increased by 2.5 words. Thus, vocabulary increase was very similar between groups. Initially, I hypothesized that by using a simplified poster, there would be fewer items to identify so there would be fewer words to focus on giving the simplified. I hypothesized using the typical poster would present many opportunities for vocabulary identification and the participants would be overstimulated with the variety of objects to choose from, having a more difficult time recalling the identified vocabulary due to the many items. This, however, proved to be untrue. The participants of Group A identified seven words while the participants of Group B identified nine words. Because similar numbers were identified, participants were on equal footing to remember vocabulary during interventions.

These findings were contrary to what I hypothesized. During the time frame of 4 weeks, both groups of participants made similar gains in vocabulary retention. However, the data were

collected with frequent exposure to the vocabulary every week throughout the entire study. It is unclear if long-term (i.e., 6 months +) lexicon gains would be seen. A long-term study would need to be conducted to see if the retention is short term or long term.

Impact on Teaching and Learning

Because there was no significant advantage in using a simplified PWIM poster, it would be recommended in most situations to use the typical PWIM poster type. However, some situations could benefit from using a simplified poster. In situations where children have vision difficulties (e.g., glaucoma), having less to focus on while identifying vocabulary would be beneficial. In addition, younger children aged 2–3 years of age with limited exposure to vocabulary may see benefits in using simplified posters of items with which they are more familiar.

Alignment to Research

Children are expected to understand and express the verbal language of their culture in relation to their language development. Language skills are based on two categories: receptive language and expressive language. The more children gain control over production of sounds and words, the more they develop their expressive language skills (Ersan, 2020). By developing these skills, a child's ability to communicate thoughts, feelings, and ideas is greatly enhanced. The current study showed both Group A and Group B received the same benefits from the PWIM posters they were exposed to with neither of the groups having large gains over the other. This finding supports the idea that exposure to opportunities to increase vocabulary is beneficial to children; therefore, either poster is of value in increasing vocabulary.

The PWIM is an appropriate approach to teaching young learners' vocabulary. Using pictures could attract the students' curiosity in learning new vocabulary. Teaching vocabulary by

using pictures is advantageous over other audio-visual aids for young learners and the colorful pictures help learners, especially lower learners, acquire the vocabulary memorably (Gu & Lornklang, 2021). By using colorful pictures that were familiar to the participants, it was easy for them to identify vocabulary. Due to familiarity of the pictures, it was simple for them to be able to recall the vocabulary by pairing the established vocabulary words with new visuals. This process allowed for them to recognize vocabulary in new situations, making the vocabulary even more accessible to the participants.

Limitations

The classroom where the study took place had 15 students, and there was little diversity as the participants' families all reported being Caucasian. The number of participants in the study was limited due to the study taking place in the small school district of Davis County Community School District. Because there were only three preK classrooms in the district and the enrollment of the program for the 2023–2024 school year was 45 students, the overall program was very small. The time frame for the implementation of the material and collection of data was only 4 weeks, making for a very quick turnaround time.

Future Research

Due to the time allotted for this study (i.e., 4 weeks), the participants were exposed daily to the vocabulary. Although this intense exposure was done to accommodate the time frame, one of the limitations of the study was checking for retention when exposure is more natural was not done. To check for true retention, checks should be made at later times (i.e., 6 months and 1 year). A longer time frame during the study would have been beneficial for making sure that the vocabulary had indeed made it into the permanent lexicon of the participants. A study that would have intense exposure for a month and then periodic checks would be a great follow-up to this

study, similar to a study of Australian children's receptive vocabulary (Christensen et al., 2014) In Christensen et al.'s (2014) study, students' vocabulary was assessed multiple times from age 4 to age 8 showing growth and permanent addition to their lexicon.

This study would easily lend itself to different demographics by varying the age, socioeconomic status, background, language, time spent in review, and parental involvement. The different groups that could be examined using typical versus simplified PWIM are numerous. Because this study only looked at preschool participants aged 4, it would be worth examining how other students responded. A particular group that would be interesting to look at would be middle and high school students, especially considering middle and high school students have had more exposure to handheld electronics; thus, one could look at students' attention spans. It would be interesting to see if attention span was a factor in identifying and retaining vocabulary words from the PWIM posters both typical and simplified. Research has shown social media and handheld electronic exposure, in some cases, had a positive effect on student's academic performance (Kennedy, 2020).

Looking at adult learners, especially illiterate participants, the use of PWIM would be an interesting demographic to study. A researcher could explore whether using a typical verse simplified PWIM poster to determine if the visual discrimination between the two posters would any yield on results. Or a researcher could explore if just using a PWIM poster to stimulate vocabulary would show an increase in the ability to visually identify and write the vocabulary to make a difference for adult learners. Furthermore, vocabulary learning strategies offer opportunities for adult English second language learners to learn vocabulary based on real world situations in the classroom. PWIM lends itself to this type of learning. PWIM supports the contributions of vocabulary learning strategies in English language teaching, which involves

several factors including: language proficiency level, gender, age, and motivation. Generally, vocabulary learning strategies offers opportunities for ESL or English as a foreign language learners and teachers to teach and learn vocabulary based on the real-world situation in the classroom (Indriyani & Sugirin, 2019).

Conclusion

PWIM is an inquiry-oriented language arts strategy that uses pictures containing familiar objects and actions to elicit words from children's listening and speaking vocabularies (Calhoun, 1999). This strategy has been used throughout classrooms across the world since 1976 (Calhoun, 1999). However, it was designed for readers and students who can identify the pictures and then transfer that knowledge to the written word. PreK students are just beginning to understand that letters make sounds that can be combined to make words. Many strategies developed for K–12 are developmentally inappropriate for preschool. Thus, PWIM is not developmentally designed with preK in mind.

So one may wonder why one should use PWIM in the preK classroom. The purpose of PWIM in the PreK classroom is to develop vocabulary. In this study, vocabulary development was looked at using two different types of PWIM posters—typical and simplified. My thought process behind comparing the different posters was I thought the simplified poster would provide fewer items to look at, enabling the participants to focus more on a few items rather than be distracted or overwhelmed by many items to choose from. The intended outcome of this action research paper is to find out if simplifying a PWIM poster will affect retention of the new vocabulary and will participants be able to integrate said vocabulary into their long-term lexicon.

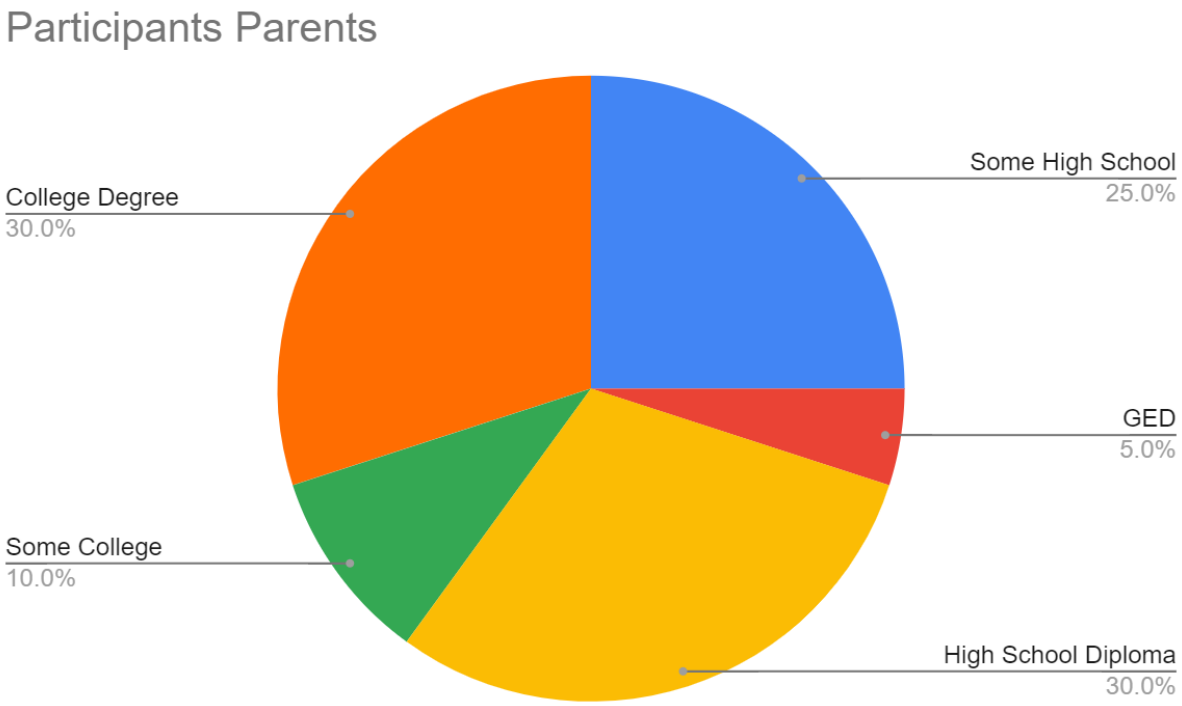
It was anticipated that the group using the simplified poster would see more gains in vocabulary retention versus the group that used a typical poster. It was surprising to find that the

groups identified similar numbers: Group A (simplified poster) identified seven words while Group B (typical poster) identified nine words. Both groups, except for one student who scored a zero on all interventions and did not see an increase in vocabulary at all, saw an increase in vocabulary from the posters. All students, except for the aforementioned student, saw an increase in vocabulary during the interventions that followed initial exposure to the posters. In the end, the findings of the study showed it was not statistically significantly different enough between the two posters to determine that one was better than the other. Either poster yielded about the same amount of vocabulary identification. The participants showed about the same vocabulary retention regardless of which poster they used. Moving forward with PWIM in the preK classroom, the results from this study showed there is no advantage to using a simplified poster. Therefore, it is recommended that a typical poster is best for use in the classroom due to the results from this study.

Words are used to communicate ideas. The more words one owns, the better they can communicate; the better they are at acquiring words, the more control they have over their own education (Calhoun, 1999). PWIM is a successful strategy in acquiring vocabulary in a way that is both engaging and relevant for participants of all ages. Although simplified verse typical PWIM posters have been found to yield similar results, it is a straightforward simple strategy for an educator to use in the classroom and is proven to yield results.

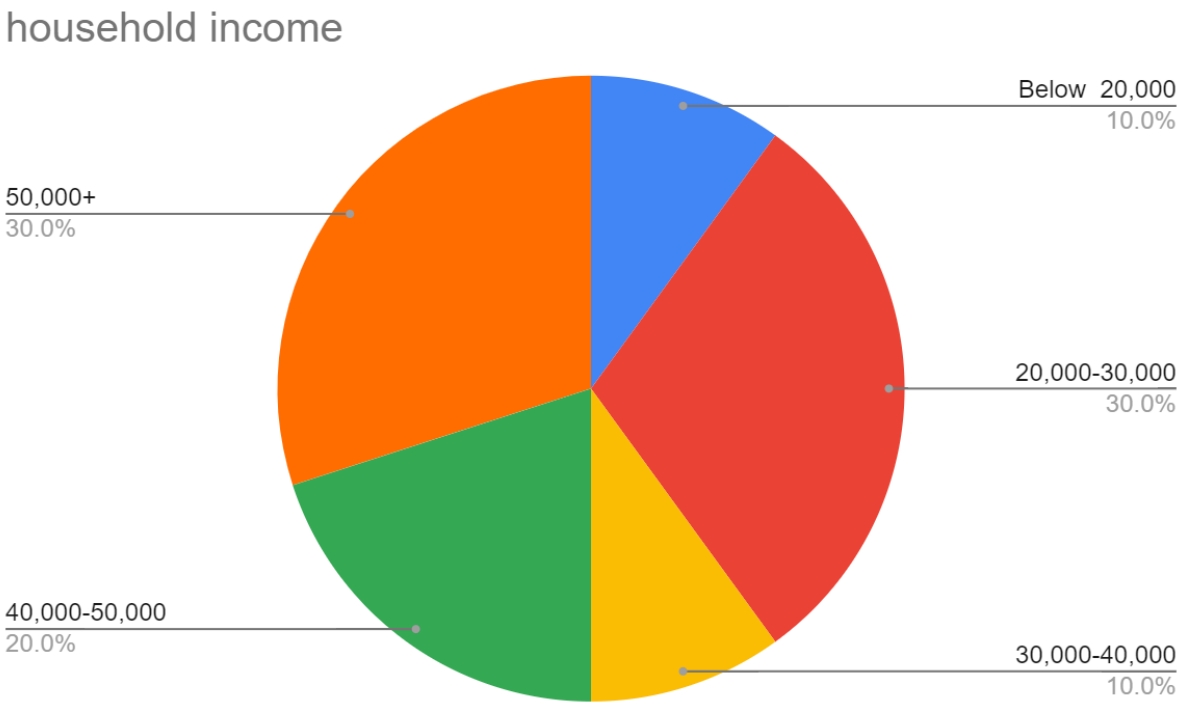
Appendix A

Education of Participants Parents Pie Chart



Appendix B

Household Income Pie Chart



Appendix C

Questionnaire and Results

1. Do you have any concerns about your child's developing speech?

   Yes- 1 No- 9

2. Your child's vocabulary is:

   a) Very low-0
   b) Low-1
   c) Average-6
   d) High-2
   e) Very High-1

3. Does your child have easy access to books at home?

   Yes-10 No-0

   Do you go to the Public Library?

   Yes- 2 No-7 Sometimes- 1

4. Does your child look at books independently?

   Yes- 9 No-1

5. Do you read to your child at home?

   Yes-10 No-1

   About how often?

   a) Daily-3
   b) 1x/week 1
   c) 2-3x/week-3
   d) 4x/week 2
   e) Once in a while 1

6. Who regularly reads to your child?

   Mom/Dad-9 Siblings-1

7. Does your child ask questions about the books he/she is being read?

   Yes-9 No-1

8. Father's Highest Education

Some High School	High School Diploma	Some College	College Degree
3	4	1	2

9. Mother's Highest Education

Some High School	High School Diploma	Some College	College Degree
2	2	2	4

10. Residence is:

    a) Single-family house 9
    b) Apartment-1
    c) Other-0

11. Household Annual Income:

    a) Below 20,000- 1
    b) 20,000-30,000- 5
    c) 30,000-40,000-0
    d) 40,000-50,000-2
    e) 50,000 +- 3

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