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Gloria Marquez
Institute of Biblical
Translation Barclay College
607 North Kingman Street
Haviland, Kansas, USA

Acquiring spanish through the methods of sun and tpr: Discovering how sun enhances comprehension and retention through vocabulary

Gloria Marquez

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Abstract
This study explores the effectiveness of combining the SUN (See, Use, Name) method and Total Physical Response (TPR) for acquiring Spanish vocabulary. Language acquisition research emphasizes the importance of multimodal learning strategies in enhancing comprehension and retention. The SUN method, which involves visual recognition, practical usage, and verbal reinforcement, aligns closely with natural language learning processes. When paired with TPR, which incorporates physical movement to reinforce meaning, learners engage both cognitive and kinesthetic faculties, leading to deeper memory encoding. This paper examines how these complementary methods facilitate vocabulary acquisition among beginner Spanish learners. Through a series of classroom interventions and learner reflections, the study demonstrates that the integration of SUN and TPR promotes not only better vocabulary recall but also more meaningful engagement with the language. Learners reported increased motivation and confidence, attributing their success to the interactive and dynamic nature of the methods. The findings suggest that language educators should consider combining visual, verbal, and physical learning strategies to optimize vocabulary instruction. The study concludes with pedagogical recommendations and implications for further research in second language acquisition using multimodal techniques.

Keywords: Spanish language acquisition, SUN method, Total Physical Response (TPR), vocabulary learning, multimodal learning, second language instruction, language retention, kinesthetic learning, comprehension strategies, beginner Spanish learners

Introduction
Language acquisition as an adult can be an arduous journey including understanding where to begin. Explicit vocabulary instruction is a method that researchers find unfavorable as well as mundane in this process. Yet, pairing explicit vocabulary instruction with a methodology that plays a role in how brain memory functions could potentially lead to some impactful outcomes.

This study was conducted to gain an understanding of which methodology, Symbolic Universal Notation (SUN) or Total Physical Response (TPR), would improve comprehension and retention while being taught vocabulary of another language, Spanish. In this quasi- experimental study, a total of twenty-eight individuals were included, with fourteen participating in each of the methodologies. After directly teaching vocabulary and performing various assessments, it was concluded that the results supported SUN as the methodology that better enhanced comprehension and retention over short and extended periods of time. These results add more literature to the topic of teaching vocabulary explicitly while also reinforcing the literature base surrounding the new methodology SUN. Our Daily Bread Ministries (ODBM) and the Institute of Biblical Translation at Barclay College partnered to discover more about the effectiveness of each methodology within literacy instruction.

From Exploration to Experimentation
Through the partnership of the Our Daily Bread Ministries Literacy Program and Barclay College, the methodology taught was how SUN had been previously used and initiated the pursuit to see what research was available regarding both SUN and movement. While exploring, I would end up discovering Total Physical Response or TPR. Its effectiveness in using movement to teach language acquisition specifically through vocabulary enticed me to continue to engage in this topic (Castro 2010) [10]. These explorations led me to conduct a

Correspondence Author;
Gloria Marquez
Institute of Biblical
Translation Barclay College
607 North Kingman Street
Haviland, Kansas, USA

study not only involving SUN, but also TPR's direct impact in teaching vocabulary. The study would also focus on the impact it would have on comprehension over a short and extended period of time.

Researching Fluency and Retention in the Process of Language Acquisition

Language acquisition is a fascinating process, especially as an adult. It is often said that it is significantly more difficult to learn a second language once an individual has become an adult (Wang 2015) [21]. Even so, there is a lack of literature to delve into when it comes to understanding the effects on why or how to improve retention and fluency to succeed in second language courses for adults. I searched across nine EBSCOhost databases as well as JSTOR to try and find research, but my search only landed five studies. Rachael Hulme (2018) [8], Erin Isbilen (2018) [9], Karla McGregor (2014) [13], and Diana Pili-Moss (2019) [14] are four authors who have researched the topic of retention in relation to second language acquisition and vocabulary. Of the five studies, only one journal was related to discussing fluency in relation to second language success. As a result, it can be noted in my quest for literature in this field that there seemed to be limited findings. My search uncovered a need to research these areas for ways to enhance both fluency and retention. Throughout this research process, retention will demonstrate the amount of language remembered over time, specifically, over the course of twenty-four hours and several weeks.

Instructor vs. Learner Perspectives

While there are varying aspects to success and failure in acquiring a new language, there are some aspects that come from the learner perspective and some that arise from the teacher perspective. For learners, some instances that can lead to success or failure depending on how they are managed are motivation, dedication/commitment, attendance, methodology in the classroom used to teach, other responsibilities outside of the classroom, and use of language outside the course itself (Rojas-Barreto & Artunduaga-Cuellar 2018; Blackmer 2016) [16, 3]. Therefore, managing each of those in a way that is conducive to successful learning would be key to working through the course to acquire the language. While it seems as though there are many student dependent goals, it is highly important that the student fully desire to want to learn the language. Without the desire, motivation, or perseverance, the teacher is left with little that they are able to do, because there is also responsibility placed on the learner (Soare 2020) [18].

With that being said, the teacher does have responsibilities to the students in their classroom. First and foremost, it is important that they are qualified to teach the course; yet qualifications on paper isn't always everything. While it is important that professors do have their credentials, they should also be able to engage the students, as Stansfield and Hornor describe their opinion that professors need, "...vitality and enthusiasm…for effective teaching" (1980). While this is not always the case, it is a reminder that there is more to engaging students than what a professor knows, but the way they depict their knowledge can lead to further engagement and understanding of the content. With that crucial piece mentioned, here are a few more aspects that are also impactful: engaging the room, sharing the expectations, hearing students' expectations, focusing on explicit vocabulary instruction, interacting with course content that leads to higher-level thinking, and teaching methodology (Larrotta 2011) [10]. Each component builds upon itself to create a classroom atmosphere that will enhance learning and improve the skills of the learner as well (Słowik-Krogulec 2019) [19].

Direct Vocabulary Instruction and Method of Instruction

While both professors and students have responsibilities to be successful, there are two aspects that will be focused on for the purposes of researching this topic in more depth. These two components are mainly focused on professor responsibilities, but it is also important for the student to be active in participating throughout the course as well. The aspects chosen are direct vocabulary instruction and the teacher method of instruction (Cormier 1988; Larrotta 2011) [5, 10]. These aspects were selected for this present study because they have shown significant impact separately but combining the two creates intrigue. The purpose of combining the two would be to analyze the impact vocabulary and the method of teacher instruction have on the learner.

First, in the past, vocabulary was seen as unimportant when learning a language because instructors stated that the focus should not be taken away from grammar and sentence structure (Amiryousefi 2010) [1]. This even led to the idea that it couldn't be taught because vocabulary needed to be experienced. Perhaps, this is why vocabulary is often seen as something that can become mundane or could also become offensive or irrelevant. This then causes learners to drift from that desire of wanting to learn (Madrigal-Hopes 2014) [12]. Therefore, this becomes a critical point for a professor or teacher to dig into the interests of students to make the learning most impactful.

Second, the teacher method of instruction in foreign language courses tends to be teacher centered in a way that does not engage students to truly interact with content in a meaningful way (Samifanni 2020) [17]. Therefore, a teacher with enthusiasm can make all the difference (Cormier 1988) [5]. Cormier actually uses a method created in the 1960s called the Dartmouth method (Stansfield and Hornor 1980) [7]. He used this method in a language and cultureimmersion workshop that showcased the way instructors present themselves is a factor that was impactful for students during the workshop. It is this method that led to the combination of seeking to understand the potential benefits of both vocabulary and teacher methodology. The Dartmouth method is helpful, but another area to investigate is creating an environment of trust that builds relationships between the student and instructor (Samifanni 2020) [7]. This brings a level of confidence that can encourage and allow students to be comfortable in making mistakes and trusting teacher direction and decisions as well. Therefore, combining the aspects of an instructor teaching larger than life as well as making those bonds with their students could potentially show results that encourage these ideas.

Language Acquisition Methods

As described previously, the teacher that instructs the course plays a significant role in learning a new language, but the methods used have an equally significant role. The language

acquisition methods being used to teach vocabulary in this study are TPR and SUN. Both methodologies vary significantly from each other. Therefore, in the following section, both will be defined as to how they will be used in this study.

Defining Total Physical Response
Diving into the research behind the Dartmouth method was fascinating. Understanding the way the teachers were fully immersing themselves and their students into language led me to wonder if there were other methodologies that were just as immersive. This wondering led me to find Total Physical Response.
TPR was crafted by a man named James J. Asher. This method was discovered when experimenting with language acquisition while observing a student internalizing the Japanese language when performing the commands. The student watched and noticed that he was using movement along with the words to make the connection behind their meaning (Asher 1966). In this study, TPR was defined as a method of teaching language or vocabulary concepts by using physical movement to react to verbal or written input. Specific movements for each of the vocabulary words were provided to help make connections with the definitions.

TPR Teaching Vocabulary Through Stories
Knowing how TPR uses motions to make connections with language comprehension and retention, it isn't surprising that creating stories or learning through them would come naturally. In the study, *Incidental Learning and Long-Term Retention of New Word Meanings from Stories: The Effect of Number of Exposures*, Hulme (2018) [8] shares how her finding demonstrated that long term retention was not affected significantly. Participants were able to recall incidental vocabulary learned a week prior through a story shared one time. In another study, Castro, shares his experience of using stories to teach language acquisition through the use of vocabulary. The impact made through TPR storytelling was significant and there was empirical evidence to demonstrate this. The average of incorrect responses during the pretest was an average of thirteen percent while the posttest scored an average of sixty-three percent (Castro 2010) [10]. Even in another study done with seventh grade students, Khakim (2019) [11] does research with explicit vocabulary teaching using TPR and his results were as follows: "The result in the mean score of pre-test in experimental group and control group were 51.54 and 50.46 and the mean score of post-test in experimental group and control group were 76.31 and 63.85." A clear distinction is found between the gain scores showing that TPR helps benefit the direct instruction even more.
Therefore, if stories are being used to teach vocabulary incidentally, then when looking at others' findings how much more valuable would direct instruction be?

Defining Symbolic Universal Notation
SUN "is a symbolic representation of all the words in Scripture. It consists of a small group of universally recognized characters that are then combined or altered to make additional symbols which are called extensions. Between the characters and extensions, all of Scripture can be represented" (Bible in Every Language). In this study, the symbols will be used to directly teach Spanish vocabulary to participants.

Defining Comprehension
For the purposes of this study, comprehension will be defined as understanding how to read a text in the language given and being able to respond to questions in the form of written responses. Comprehension can also be elicited through the creation of a play, presentation of interest, or even a game.

Making an Impact on Memory
Both SUN and TPR are taught with enthusiasm, which lead to connections and engagement with the content (Castro 2010) [10]. When applying the enthusiasm and the unique characteristics of each methodology, it leads to intrigue on whether that increases retention within a short and long term period of time. Since SUN is such a new methodology, there is no research that has been completed to support whether SUN helps learners retain information over the short and long term. On the other hand, TPR has been around for much more time. Yet regardless of how long each of the methodologies have been around, our cognitive abilities must be addressed in order to understand the effect that they are making.
To begin with, there is a process known as lateralization in the brain where information will cross from the left to the right to process in varying ways. This allows for the brain to not only comprehend information but retain it as well (Price 2020) [15]. This switch of interaction between both sides of the brain plays an impact on memory because it is causing the whole brain to work allowing all of the information to process together (Goldie 2015) [6]. When discussing both SUN and TPR, each of them starts with right brain tasks such as intuitive thought, non-verbal action, and even imagination. After their initial encounter with the methodologies, the thinking switches to the left side rather quickly completing tasks where they are required to use analytical thought to discover the meaning of a story and plan their own which again cases the thinking to switch to left side. This time using creativity through writing and art while using their imagination. This process continues throughout the entirety of the study. This is a critical aspect because of the role it plays within the brain and how it will retain information.
Another window of opportunity for TPR and SUN to make an impact on memory as well as comprehension is by incorporating Bloom's Taxonomy of higher-level thinking. This engages the participants in their short and long term memory. As one ascends the levels of taxonomy, the deeper the learner will interact with the content presented to them. The more that participants interact the more the learner will remember the language and be able to engage with the language that is being learned. This is especially true as the language being taught is chunked for the purpose of retention and comprehension. Isbilen (2018) [9] states her findings as "the incoming sensory signal must be processed and encoded as soon as it is encountered, before it is lost or overwritten by new incoming material." The methods that have been created for this study allow time to process before moving on to new information. It even allows time to create and applytheir learning for the day. Again, this reinforces the thinking of the content at various levels by using small chunks of language to achieve both comprehension and retention in the short and long term.

Purpose of the Study
Understanding how each of the methodologies can be

applied to language acquisition to enhance memory and comprehension were the critical pieces in knowing the direction to take for this study. This understanding led me to specifically question how vocabulary would impact both comprehension and retention as expressed in my question for this study: when teaching adult learners another language, which method, Total Physical Response (TPR) or Symbolic Universal Notation (SUN), will show itself to enhance comprehension and retention when they are used to teach vocabulary?

Hypothesis
Based on previous experiences with SUN, I believe that this methodology will not only build vocabulary depth but provide a conceptual understanding of how language flows. Due to the lack of research for the new methodology of SUN, studies that can be used to support this idea are limited. Even so, SUN is designed and taught in way that does tap in to how the brain functions. It works through the process of brain lateralization. This naturally occurs when teaching SUN because it moves quickly from task to task to support memory through application, by incorporating simple to complex tasks that shifts thinking from the brain from left to right. Hence, through each of these aspects and its visual connections, I think it will allow adult learners to retain and comprehend more of the Spanish language. While TPR will also make connections, I do not think that it will be as successful in the comprehension aspect. With that being said, the results will only account for ten hours' worth of Spanish taught throughout each week.

Methods
Now having insight into where this study commenced, the purpose of it, and the definition behind TPR and SUN, next is grasping how the research question was carried out.
This aspect is a critical piece in yielding results that can be utilized and added to the literature.

Research Design
The quantitative research design chosen for this study was the quasi-experimental. The reason was because there was potential for there not to be randomness in groupings to occur. It was truly dependent on the number of the participants available as well as their background knowledge of the Spanish language. These participants were broken up within two categories: limited exposure to language and minimal exposure to language. Limited exposure referred to participants who knew less than seventy-five words, could not form complete sentences, and could not read a text and comprehend it. Minimal exposure referred to the participant either knowing nothing about the language or only a handful of words.

Separating participants based on their level allowed randomness to occur within the groups but did not allow randomness to occur entirely due to specific placement of certain individuals to be able to address the treatment of the participants properly. The quasi- experimental design chosen also incorporated a pretest and posttest which was most beneficial in answering the research question for this study. This allowed for me to see what participants already knew, then allowed me to proceed sorting the groups, as well as learn how much was learned based on the method taught.

A total of twenty-eight participants were used who had either no experience with the Spanish language or very limited exposure to the language. Participants were ages fourteen and older. Each of the participants were gathered through churches or seminaries in the United States, Nigeria, and Ethiopia.

A teacher was chosen for this study. The same person was used throughout each setting so that there would be no interference between weeks with things such as personality and consistency. The instructor chosen already knew SUN and TPR so there was no need to reteach the methods. This person was given time to go over the procedures, ask questions, and met with me in order to best carryout the plan. This person also had a background in teaching.

Setting
The setting took place in either classroom-like rooms or in a home. Each method conducted had an equal number of trials that took place at each of the locations. The atmosphere provided an environment that was conducive to learning. All sessions took place in the evening.

Variables
The independent variables are the methodologies (SUN and TPR) used because they will impact the results. Each will have an effect on the dependent variables. The dependent variables are comprehension and retention. Based on the methodologies taught, the dependent variables will be affected and evidenced through the use of activities, observations, and assessments. The teaching methods of SUN and TPR will not be mixed. Neither methodology will be reflected in combination. Each method will be placed in a container of its own so that both can be tested for their own effectiveness and in comparison to each other.

Procedures
It is important to describe that the structure of each week was very similar. The constants between both weeks included the amount of time spent learning the Spanish language, similar environments, the same instructor, the same assessments, and the same activities (e.g. Spanish stories, creating stories, etc.). The only difference was the methodology taught. The methods used were not intertwined in any way. Each of them were used separately and according to the procedures given below. The methods taught were tested through the participants ability to retain and comprehend each day as well as after the week had ended.

Selection of Participants
Participants were selected by asking church groups and seminaries if they had attendees that would be interested in learning the Spanish language who had no experience in it or limited exposure. If a person was interested, they filled out a survey. If selected, participants were given key details about meeting dates and times.

Teacher Selection
The selection of the instructor took place by conducting interviews by phone. Notes were taken to decide upon which person would fit best. The person was not required to know both SUN and TPR because each of those could be taught. Regardless, the person selected did already know both methodologies.

Teaching Spanish Through SUN Methodology

During the week of SUN, the first thing that participants were given was the pretest. Immediately following that, participants began the first SUN lesson. All SUN lessons were conducted the same way. Five cards were shared and reviewed before the next five were shared.

This continued until all twenty cards for the day had been shared and reviewed by the participants. After completing the SUN cards, the group was shown a chart that showed examples of words with different conjugations. Immediately after, every person received a short story quiz. Everyone was given time to complete it alone and then they worked together to fill in any blanks. Times where participants worked together were noted with a different color pen. Once this step was complete, participants worked in groups to create their own story. When groups were done, each group shared their story while the groups watching wrote down what they thought it meant. Then, they were able to hear what the story meant in English to see if they understood. Groups would then rotate until all groups took a turn. Once this was completed, the remainder of the time consisted of time for questions.

The remainder of the days were the same as the first. The only differences consisted of there being no pretest being conducted during the last four days, a vocabulary quiz being given at the start of class on days two to five, and a posttest on the final day. Everything else was done in the same order as day one.

Teaching Spanish Through TPR Methodology

During the week of TPR, the first thing that participants were given was the pretest. Immediately following that, participants began the first TPR lesson. All TPR lessons were conducted the same way. Five cards were shared and reviewed before the next five were shared. This continued until all twenty cards for the day had been shared and reviewed by the participants. After completing the TPR cards, the group was shown a chart that showed examples of words with different conjugations. Immediately after, every person received a short story quiz. Everyone was given time to complete it alone and then they worked together to fill in anyblanks. Times where participants worked together were noted with a different color pen. Once this step was complete, participants worked in groups to create their own story. When groups were done, each group shared their story while the groups watching wrote down what they thought it meant. Then, they were able to hear what the story meant in English to see if they understood. Groups would then rotate until all groups took a turn. Once this was completed, the remainder of the time consisted of time for questions.

The remainder of the days were the same as the first. The only differences consisted of there being no pretest being conducted during the last four days, a vocabulary quiz being given at the start of class on days two to five, and a posttest on the final day. Everything else was done in the same order as day one.

Weeks After Each Study Conducted

Participants received a Short Spanish Story for them to work through each week for four weeks. The participants were told to complete it without help and then they were to send it back when complete. These were completed for both groups to see how much was retained from each method.

Results

In this section, the results will show how the data collected supported the exploration of this study. The goal was to find whether TPR or SUN was able to enhance comprehension and retention when teaching vocabulary. You will find discussion regarding the research question prior to finding the charts demonstrating the mean of each section to clarify any discrepancies that would be unclear in the visuals (to find all data points look at appendix A).

Data Collection Method

To assess whether these methodologies aid in the process of learning another language, two components were monitored. They were the areas of comprehension and retention of language over time. The assessments used included a pretest, posttest, daily quizzes, a short story quiz, and a Forms Microsoft Quiz. All assessment tools were collected from participants and then graded by me. Grading occurred by checking the accuracy of the words translated from English to Spanish and at times from Spanish to English. Following this, all data were inputted into tables for a clear depiction of what was completed by each participant daily and weekly.

The mean will be expressed throughout each assessment to show the averages of participants and to help balance any irregularities that may be found in either group. This will also help identify the amount of growth and retention found with each participant. Overall, it will be noted how SUN enhanced comprehension and retention more than TPR throughout each of the sections.

Comprehension (Daily)

This section will present the data collected on short story daily quizzes. These quizzes were given the same day the vocabulary was taught. Therefore, this portion of the data only tested comprehension of the vocabulary that had been learned by the participant in less than twenty-four hours.

When looking at the results, it can be quickly identified that day five showed the highest success rates while day four showed the least amount of comprehension (see appendix A). Each piece of evidence for this section shows a clear indication as to which method enhanced comprehension more so than the other. When looking at the mean, the final average shows that SUN performed better than TPR. This demonstrated that SUN was the method that better enhanced comprehension for this section.

Short Story Quizzes Chart

Chart 1: Short Story Quiz Results: SUN vs TPR Methods

Short Story Quizzes	SUN Daily Mean	TPR Daily Mean
Short Story Quiz 1	21 / 39	20 / 39
Short Story Quiz 2	21 / 30	21 / 30
Short Story Quiz 3	27 / 37	27 / 37
Short Story Quiz 4	30 / 35	29 / 35
Short Story Quiz 5	28 / 52	28 / 52
Weekly Mean	111 / 193 = 58%	108 / 193 = 56%

Comprehension and Retention (Short-Term)

Throughout this component, the goal is to showcase what was remembered and understood within a twenty-four hour period. This data will be used to compare the results with the long-term data to see if there are any similarities or differences between the short and long term.

When looking at the raw data, it may appear difficult to grasp which group performed better than the other each day as well as collectively. First, it can be clearly seen that the daily quiz 4 had the lowest results for the entire week whether it was SUN or TPR. Also, when looking at the lines in the graph (see appendix A), it can be seen how the daily quiz one and two, were where participants scored higher. Towards the end of the week both daily quiz three and four are significantly below its counterparts. To verify these points, the mean was taken for each of the days and then for the week as well. The means are represented in the chart below. Based on the data, one can conclude that SUN performed better with daily retention and comprehension.

SUN and TPR Daily Quizzes Chart

Chart 2: Daily Quiz Results: SUN vs TPR Methods

Daily Quizzes	SUN Daily Mean	TPR Daily Mean
Daily Quiz 1	16 / 20	16 / 20
Daily Quiz 2	17 / 20	16 / 20
Daily Quiz 3	16 / 20	14 / 20
Daily Quiz 4	14 / 20	12 / 20
Weekly Mean	**63 / 80 = 80%**	**58 / 80 = 75%**

Pretest and Posttest

When looking at the raw data of the pretest and posttest, it can be clearly and quickly seen that everyone in the group knew less than a third of what would be learned throughout the week. Both groups had very similar pretest scores. Both groups had participants who scored a single digit, nine participants who scored between the ten to twenty-nine range, and then four participants who scored higher than that range. Both of the highest scores were in the seventies and there was one located in each group. This indicates how the playing field was leveled when comparing results between the groups.

Chart 3: Assessment Results: SUN vs TPR Methods

Assessment	SUN Mean	TPR Mean
Pretest	27 / 295 = 9%	29 / 295 = 10%
Posttest	127 / 295 = 43%	144 / 295 = 49%
Growth Shown	100 / 295 = 34%	115 / 295 = 39%

The mean was taken to show growth between the pretest and posttest. It can be seen in the chart below, SUN, began with nine percent and TPR with a ten percent understanding of the passage. Both methodologies again, performed similarly, but this time it can be concluded that TPR had the higher scores overall with five percent more growth shown by the end of the week. SUN and TPR Chart of Gain Scores

Chart 4: Assessment Results: SUN vs TPR Methods

Assessment	SUN Mean	TPR Mean
Pretest	27 / 295 = 9%	29 / 295 = 10%
Posttest	127 / 295 = 43%	144 / 295 = 49%
Growth Shown	100 / 295 = 34%	115 / 295 = 39%

In this section, the goal of the data is to represent which methodology performed best in comprehension and retention over a four-week period of time. This section achieves that by having sent out weekly quizzes to participants related to the specific vocabulary learned. When completed, the scores were inputted into the tables (see appendix A).

Immediately when looking at the charts, it can be clearly seen that not all participants contributed to the results of this section (see appendix A). There were about five participants within each group that did not complete most or any of the quizzes sent out weekly. Even so, the remaining of the participants' data were analyzed.

When looking at the amount of language retained and understood, it can be stated that it was relatively consistent between both groups. To verify this, the table below shows the mean over the course of each week and the entirety of the four weeks. Overall, the data shows a steady diminishing of language retention over the course of each week with the exception of week two.

Week two was the highest scoring section for both groups. Through the means presented in this chart, it is clear that SUN showed a higher comprehension and retention rate over an extended period.

Weekly Quizzes Chart

Chart 5: Weekly Quiz Results: SUN vs TPR Methods

Weekly Quizzes	SUN Mean	TPR Mean
Week 1	25 / 39 = 65%	22 / 39 = 56%
Week 2	22 / 30 = 73%	20 / 30 = 66%
Week 3	24 / 36 = 66%	23 / 36 = 64%
Week 4	21 / 33 = 64%	18 / 33 = 56%
Mean of all 4 weeks	92 / 138 = 67%	83 / 138 = 60%

t-Test Analysis

In order to understand if the methodology the group participated in had an effect on the individuals, it was necessary to conduct a t-test. The specific test used for this analysis was the t test: paired two sample for means. It was chosen because the study aimed to compare two separate treatments and identify if there was a difference based on the results. The importance of running the t-test was to show that there was a significance in the difference between the methodologies used to teach vocabulary during the language acquisition process.

These statistical tests were conducted by utilizing the results from each of the assessments given throughout the study (see appendix B). Two of the four times the t-test was conducted the t-scores were significantly above the critical t-score. Therefore, the two

assessments: Daily Quizzes and Weekly Quizzes were above the critical score. This signaled that there was a substantial difference between the groups.

The method that represented the considerable difference was SUN. This signifies how SUN's impact on the participants in relation to comprehension and retention benefitted the group in a sizable and recognizable way compared to the TPR group. It can be captured as follows: the fourteen participants who received the SUN intervention (M = 15.4, SD = 1.68) compared to the fourteen participants who received the TPR intervention (M = 13.7, SD = 2.04) demonstrated significantly better peak flow scores when comparing daily quiz results, t (2) = 7.4, p = .01. This was again true when comparing the weekly quizzes conducted after the study. The participants who received the SUN intervention (M = 22.2, SD = 1.32) compared to the participants who received the TPR intervention (M = 20.3, SD = 2.17) demonstrated significantly better peak flow scores, t (2) = 7.4, p = .06. Meanwhile, in the assessments of short story quizzes and pretest and posttest there was no sizable effect on the participants. Identifying that both

methods had similar effects on their individuals.

Overall Conclusion of Results
SUN performed better than TPR in three of the four areas: the short story quizzes, daily quizzes, and the weekly quizzes conducted after the study (see figure 1). This testifies to how SUN better enhanced the comprehension and retention of a learner acquiring Spanish as a second language. The evidence demonstrates how SUN not only benefited learners in the short-term, but in the long-term as well. TPR was a close competitor. Its results did show that it enhanced the participants comprehension and retention, but not as well as SUN. The results were supported through the findings of t-scores sharing the impact that the SUN methodology had in seventy five percent of the assessments given.
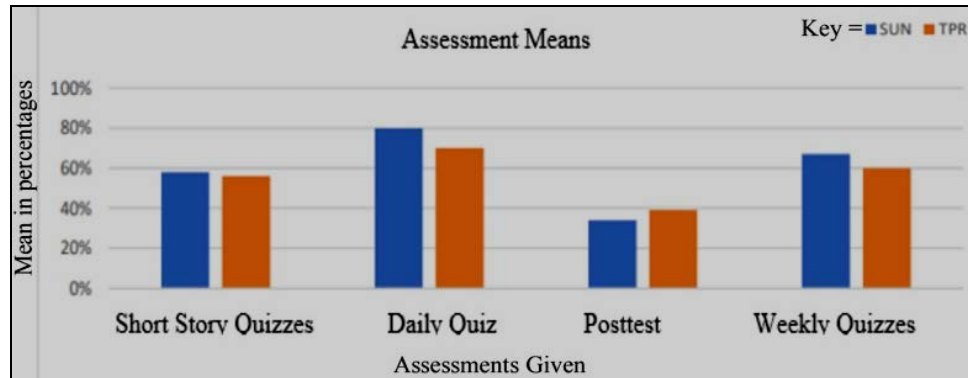

Fig 1: Comparison of SUN and TPR Assessment Means Across Quiz Types

Discussion
Several outcomes were made evident as it relates to teaching vocabulary to enhance comprehension and retention using the methodologies SUN and TPR. SUN was identified as being more effective than TPR in both comprehension and retention over short and extended periods of time. Specifically, regarding this information, there were four major findings regarding comprehension and retention as it relates to the methodologies used while teachingvocabulary. The second, third, and fourth results are all connected to the comprehension and retention of vocabulary over varying periods of time.

Major Findings
Initial Comprehension of the Vocabulary
Immediate comprehension of the vocabulary taught by both methodologies was over fifty percent a hundred percent of the time. Immediate comprehension referred to the short stories that would follow the SUN or TPR lesson and practice. This section provided information regarding how the method was able to be captured by learners in that present moment. While these were some of the highest percentages, the method that had a better performance was SUN. It performed better by two percent. While it is not much, when learning language over the course of time that two percent can become much more.

Comprehension and Retention (Short-Term)
Comprehension and retention over a twenty-four hour period were over seventy percent about eighty-eight percent of the time. This component from the data revolved around the daily quizzes. These were given exactly twenty-four hours after learning the vocabulary and interacting with them the previous day. Therefore, there were only four daily quizzers because twenty-fours would have needed to pass prior to having been given this assessment. This was another area where the participants performed well a majority of the time. Yet, SUN outperformed TPR again by five percent.

Comprehension and Retention (Long-Term)
After a five-day period, comprehension and retention through a pretest/posttest assessment was over thirty percent. This meant that at least one hundred words were gained and retained after five days. Again, the pretest and posttest were identical, and the words used within the assessment were words that were studied throughout the week. It was here where TPR surpassed SUN's percentages by five percent. This demonstrated how TPR supported its learners over the long term. This section was one where the average of the scores were lowest. This assessment is also the longest. It contains the most words as well as conjugations which requires extra focus to accurately account for what the text is attempting to say.

Comprehension and Retention After the Study (Long Term)
The last major finding was how after the study comprehension and retention results were almost always greater than sixty percent. These after the study assessments were short stories, between three to four sentences, that participants were required to translate without aide or practice after the conclusion of the study. This section was where not all participants

contributed. There were an equal amount of people who did not take part from each method. The number of people who did not respond back were four, two from SUN and two from TPR. The number of nonparticipants was not significant and balanced therefore not completely invalidating the data presented as a majority from both methods contributed. In this section, SUN also performed better than TPR by seven percent. This showed how over the course of a total of four weeks, SUN aided its participants memory in the long term.

Based on these conclusions, it can be stated that overall, SUN benefitted the participants in both the short term and long term while TPR benefitted its participants only in the long term. Even then, TPR's long term was reflective of a week long assessment while SUN's long term reflected

weekly assessments after the completion of the study. All in all, SUN enhanced comprehension and retention of language acquisition through vocabulary better than TPR.

Meeting Needs within the Field of Language Acquisition
Each of these outcomes met a need that can be useful to the field of language acquisition. One of those needs involved the debate on whether or not to explicitly teach vocabulary. It was stated that teaching vocabulary was not beneficial, how grammar and sentence structure
were more important, and that vocabulary was something that should be experienced (Madrigal- Hopes 2014) [12]. While I do agree that grammar and sentence structure are important, I do not see it as being more important than the others. They go hand in hand. At the same time, I do agree that experiencing language is critical. Both methodologies allow vocabulary to be experienced. SUN is experienced through visuals and TPR through movement. I do find it necessary that vocabulary is learned in order to effectively interact with the language. It is a part of how the learner is able to continue to interact and engage in the language more naturally. It is through understanding the meaning behind the words that people are able to comprehend conversations or passages as was done in this study. By teaching vocabulary explicitly, it allowed participants to engage in language in a way that didn't feel pressured, allowed them to seek out complete thoughts, and build upon the observations they made. It is through these opportunities that it can be seen from the data how vocabulary allowed for participants to grow over the study. This can specifically be seen through the posttest as was identified in major finding number three.
At the same time, if vocabulary isn't remembered then it isn't effective in communicating or applying the language. Therefore, comprehension and retention of vocabulary was the vital point of observation. That is exactly why each of the assessments were focused in on these components and were where the major findings of this study were acquired. This brings us to another need met that is useful to the field of language acquisition. The need would be to decide which methodology would teach vocabulary most effectively. It was critical to understand which methodology would teach the vocabulary in a way that would impact both comprehension and retention in order to better enhance the process of language acquisition. Through the data provided previously, and the figures shown below, it was demonstrated how each of the methodologies performed well in both areas. Yet only one, SUN, performed better in three of
the four assessments. SUN was able to show higher performance in comprehension and retention consistently over the course of the entire length of time the study was conducted (figure 1). SUN was not only able to cross cultures (figure 2), living environments, and the setting of where the lesson took place, but it even crossed age differences as well (figure 3). This was done through the process of teaching vocabulary only and systematically using each methodology to engage the learners. There was not any emphasis on grammar nor sentence structure, yet participants were still engaged and motivated to continue to learn.
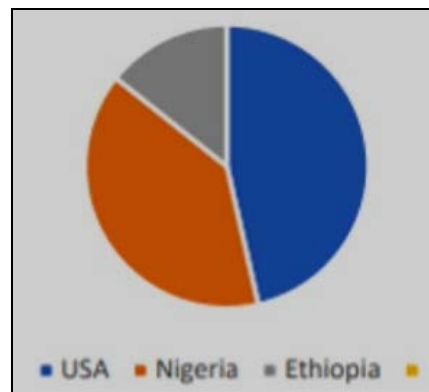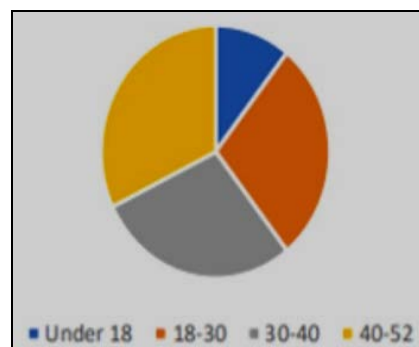

Fig 2: Countries Represented

Fig 3: Ages Represented

Limitations of the Study
Bias
Having worked with SUN in a variety of ways is a process that has shown me evidence of its strength and impact. Therefore, if not careful, that connection of work done previously with the methodology could impact how the data are interpreted. It is for this reason that the methods
for each of these processes were as similar as possible. It is also for this reason that when grading assignments there was not a gray area. All was clear in what was determined as correct. Summary
The SUN methodology used to teach vocabulary was more effective in enhancing comprehension and retention when acquiring another language than TPR. This finding was determined by analyzing the outcomes of four varying assessments that were conducted from daily periods to weekly periods of time. TPR and SUN's results were consistently very close in averages throughout the entirety of the study. TPR only performed better during the posttest given at the end of the week. Therefore, TPR had a better overall comprehension and retention of the vocabulary words over the course of the week. Meanwhile, SUN had a better overall comprehension and retention of the vocabulary words over immediate, daily, and weekly assessments given.
The research, supported by the Institute of Biblical Translation at Barclay College helps the Our Daily Bread Ministries Literacy Program (ODBMLP) by examining the retention of vocabulary. This system of teaching called Symbolic Universal Notation (SUN), which is also woven into Barclay curriculum within the Master of Arts in Literacy Methodology and Master of Arts in Biblical Translation is key to the foundation of early stages of literacy. From the use of Spanish vocabulary teaching through SUN, the measured comprehension of words and

length of retention shown evidences a base of vocabulary teaching that is accelerated in the ODBMLP.

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Appendix
Appendix A
Comprehension (Daily) SUN Table

Comprehension	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14
Short Story Day 1 (out of 39)	27	21	23	17	16	26	30	28	21	30	24	26	18	14
Short Story Day 2 (out of 30)	24	18	19	15	14	26	27	26	25	27	21	25	17	15
Short Story Day 3 (out of 37)	26	20	20	18	17	28	27	29	27	30	22	27	15	13
Short Story Day 4 (out of 35)	24	22	20	18	17	27	23	27	23	29	24	25	15	13
Short Story Day 5 (out of 52)	26	25	26	24	14	33	42	48	29	43	26	42	18	15

TPR Table

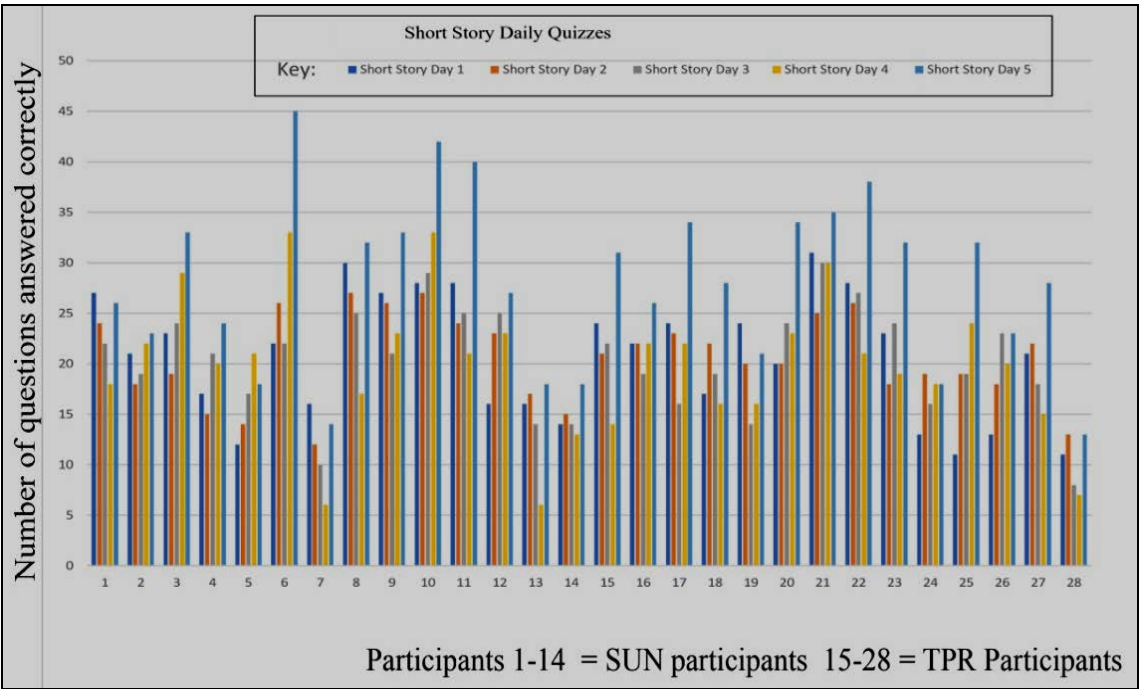| Comprehension	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14
Short Story Day 1 (out of 39)	27	21	23	17	12	22	16	30	27	28	28	16	16	14
Short Story Day 2 (out of 30)	24	18	19	15	14	26	12	27	26	27	23	24	17	15
Short Story Day 3 (out of 37)	22	19	24	21	17	22	10	25	21	29	25	14	16	14
Short Story Day 4 (out of 35)	18	22	29	20	21	33	6	17	23	33	21	23	6	14
Short Story Day 5 (out of 52)	26	23	33	24	18	45	14	32	33	42	40	27	18	18

Fig 1: Short Story Quizzes Results: Bar Graph

Comprehension and Retention (Shorter Period of Time)
Daily Quizzes SUN Table

Quiz	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14
SUN Daily Quiz 1	17	17	18	15	12	19	6	19	17	20	18	20	15	10
SUN Daily Quiz 2	20	20	18	16	16	16	8	15	19	20	18	15	13	13
SUN Daily Quiz 3	19	20	20	17	16	20	3	17	19	14	17	19	7	7
SUN Daily Quiz 4	6	18	17	18	18	20	4	12	14	14	17	15	10	8

Quiz	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24	P25	P26	P27	P28
TPR Daily Quiz 1	15	17	20	18	16	17	19	19	16	10	16	19	10	14
TPR Daily Quiz 2	14	17	17	20	19	20	16	14	14	11	17	16	20	11
TPR Daily Quiz 3	9	13	18	16	10	13	17	8	15	12	20	20	11	11
TPR Daily Quiz 4	13	16	13	8	12	7	17	9	8	11	20	17	6	8
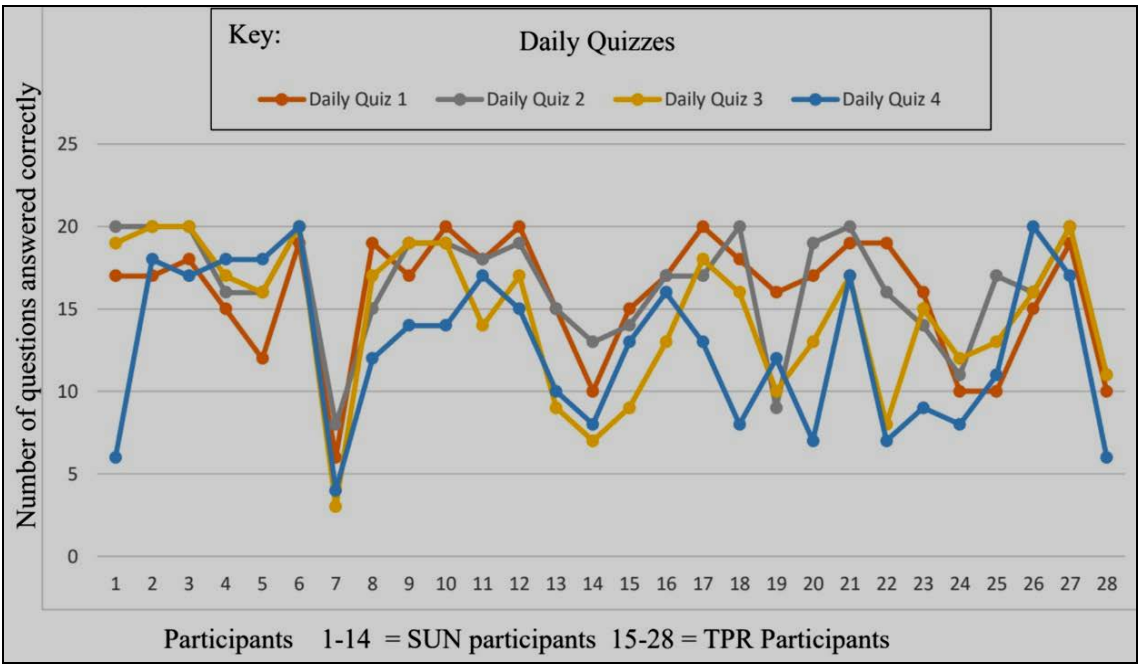
Fig 2: Line Graph Results

Pretest and Posttest SUN Table

Participant	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14
Pre-Test	35	21	29	16	10	26	16	62	75	74	17	37	22	14
Post-Test	60	114	156	108	52	193	56	185	150	227	177	153	88	65

Participant	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24	P25	P26	P27	P28
Pre-Test	16	52	26	20	18	67	71	28	7	12	2	23	17	31
Post-Test	133	176	188	157	106	165	250	149	123	91	165	165	142	60
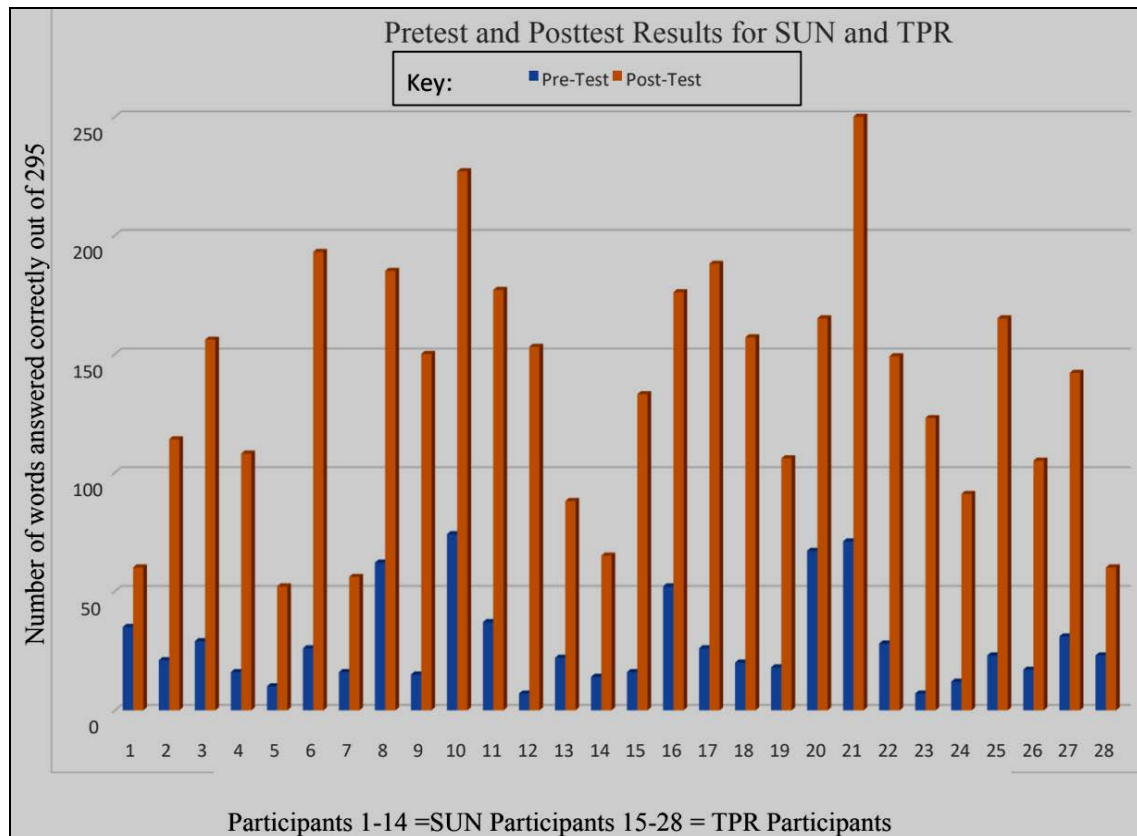
Fig 3: Bar Graph Results

Comprehension and Retention (Extended Period of Time) SUN Weekly Quizzes Chart

Week	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14
Week 1 (out of 39)	10	30	36	—	36	36	31	30	31	22	20	24	—	—
Week 2 (out of 39)	28	—	30	25	30	9	21	26	18	25	26	27	—	—
Week 3 (out of 36)	26	25	35	—	35	26	26	16	32	19	17	—	—	—
Week 4 (out of 33)	22	—	32	—	32	4	21	14	33	19	13	—	—	—

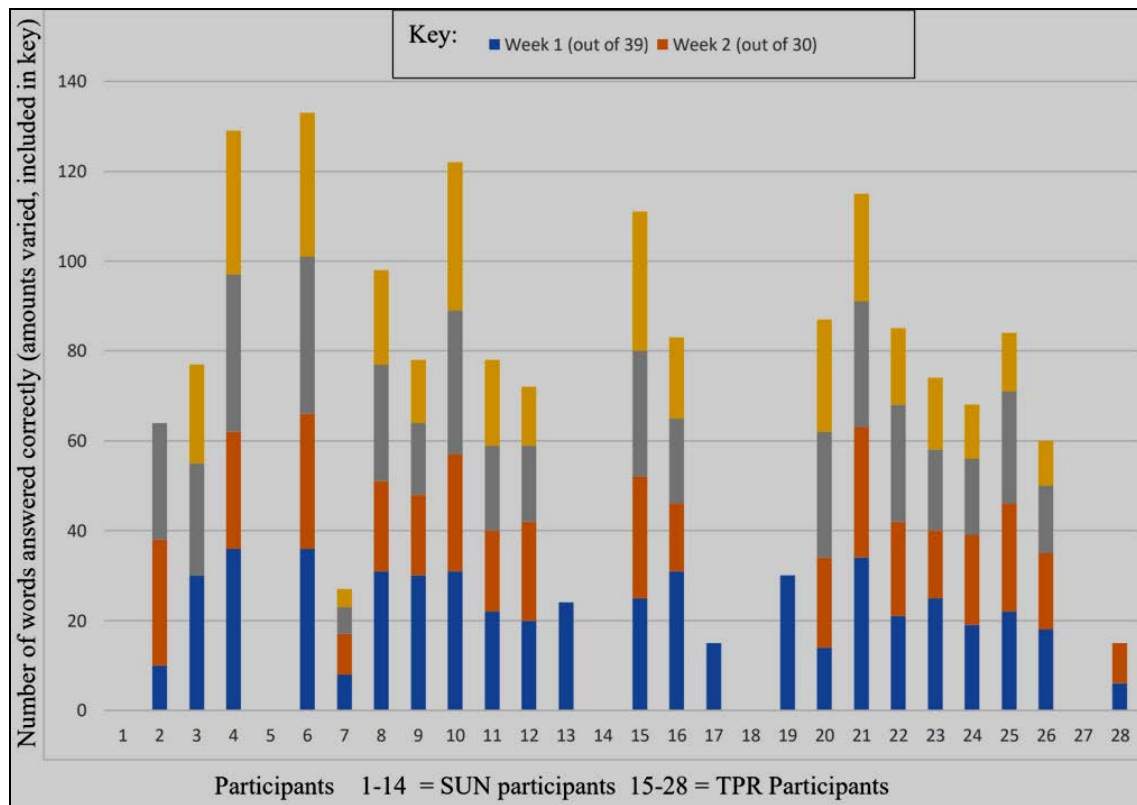| Week	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24	P25	P26	P27	P28
Week 1 (out of 39)	25	31	15	—	30	14	34	21	25	19	22	18	6	—
Week 2 (out of 39)	27	15	—	—	20	20	29	21	15	20	24	17	9	—
Week 3 (out of 36)	26	18	—	—	28	28	25	20	16	25	15	15	—	—
Week 4 (out of 33)	31	18	—	—	25	24	17	16	12	13	12	10	—	—

Fig 4: Weekly Quizzes Stacked Bar Graph

Appendix B T - Scores

Table 1: Pretest and Posttest - t-Test: Paired Two Sample for Means

Statistic	SUN	TPR
Mean	79	89.07
Variance	4475.08	4613.07
Observations	27	27
Pearson Correlation	-	0.626035
Hypothesized Mean Difference	-	0
Degrees of Freedom (df)	-	26
t Stat	-	-0.89783
P(T ≤ t) one-tail	-	0.188579
t Critical one-tail	-	1.705618
P(T ≤ t) two-tail	-	0.377518
t Critical two-tail	-	2.055529

Table 2: Short Story Quizzes - t-Test: Paired Two Sample for Means

Statistic	SUN	TPR
Mean	22.375	21.91
Variance	14.43	17.25
Observations	4	4
Pearson Correlation	-	0.9912
Hypothesized Mean Difference	-	0
Degrees of Freedom (df)	-	3
t Stat	-	1.4626
P(T ≤ t) one-tail	-	0.1199
t Critical one-tail	-	2.3534
P(T ≤ t) two-tail	-	0.2398
t Critical two-tail	-	3.1824

Table 3: Daily Quizzes - t-Test: Paired Two Sample for Means

Statistic	SUN	TPR
Mean	15.38	13.71
Variance	2.83	4.15
Observations	3	3
Pearson Correlation	-	0.996
Hypothesized Mean Difference	-	0
Degrees of Freedom (df)	-	2
t Stat	-	7.34
P(T ≤ t) one-tail	-	0.0009
t Critical one-tail	-	2.92
P(T ≤ t) two-tail	-	0.0018
t Critical two-tail	-	4.30

Table 4: Weekly Post Quizzes - t-Test: Paired Two Sample for Means

Statistic	SUN	TPR
Mean	22.22	20.27
Variance	1.76	4.70
Observations	3	3
Pearson Correlation	-	1.00
Hypothesized Mean Difference	-	0
Degrees of Freedom (df)	-	2
t Stat	-	4.05
P(T ≤ t) one-tail	-	0.02797
t Critical one-tail	-	2.92
P(T ≤ t) two-tail	-	0.05595
t Critical two-tail	-	4.30