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QUANTITATIVE ANALYSIS OF THE EFFECTS OF PROJECT-BASED LEARNING ON VOCABULARY RECALL

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Innovative Pedagogies in English Teaching

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APROVAL PAGE

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RESUMEN

Estudios cualitativos actuales sobre el Aprendizaje Basado en Proyectos sugieren que dicha metodología tendría efectos positivos en la enseñanza del idioma inglés (Golden et al., 2014). El Aprendizaje Basado en Proyectos provee más tiempo de conversación a los estudiantes avanzados (Campbell, 2012), integra los contenidos con las destrezas (Beckett, 2002), y aumenta la motivación (Beneke and Ostrosky, 2009). Desafortunadamente no ha sido posible encontrar estudios cuantitativos rigurosos que permitan validar estas afirmaciones. De acuerdo con Farhady (2006), el diseño experimental es mejor para comprobar la efectividad de nuevas metodologías. Dicho diseño ha sido fundamental para investigar cómo afecta el Aprendizaje Basado en Proyectos al desempeño académico de los estudiantes de inglés mediante el método científico. El vocabulario favorece el desarrollo de otras destrezas como leer y posibilita la fluidez al hablar (Nation & Waring, 1997). Se intenta investigar entonces si el Aprendizaje Basado en Proyectos contribuye a mejorar las habilidades para recordar palabras de vocabulario en Ingles. Algunas prepruebas y pospruebas de vocabulario se usan en este estudio para medir la efectividad del Aprendizaje Basado en Proyectos en la habilidad para recordar palabras de vocabulario para luego comparar los resultados mediante una prueba t. Este diseño requirió seguir los pasos del método experimental, usando muestras de dos grupos de participantes seleccionados de forma aleatoria. Con los resultados, al final se pudo diseñar una guía rápida con sugerencias para utilizar el método del Aprendizaje Basado en Proyectos con el fin de mejorar las habilidades para recordar palabras de vocabulario.

Palabras clave: proyecto, vocabulario, metodología, recordar, conocimiento.

ABSTRACT

Reviews of qualitative studies about Project Based Learning suggest that it positively affects the outcome of English Language Learners (Golden et al., 2014). Project-Based Learning provides high speaking time with English-proficient students (Campbell, 2012), integrates content and skills (Beckett, 2002), and increases motivation (Beneke and Ostrosky, 2009). Unfortunately, it was impossible to locate any rigorous quantitative empirical evidence supporting these claims. According to Farhady (2006), the experimental design is best to measure the effectiveness of new methodologies. Therefore, it was essential to investigate how Project Based Learning affects the academic achievement of English Language Learners by conducting empirical research. Vocabulary provides the necessary input to develop other skills such as reading and writing and making speaking fluency possible (Nation & Waring, 1997). Therefore, we seek to investigate if project-based Learning can contribute to enhancing vocabulary recall. A series of pretests and posttests measure the effectiveness of Project-Based Learning on vocabulary recall using a t-test to compare the results. Such a design required an experimental approach using two groups of participants. Finally, we created a guide of suggestions for using project-based Learning to enhance vocabulary recall.

KEY WORDS: Project, Vocabulary, Methodology, Recall, Knowledge

GENERAL CONTENTS INDEX

INTRODUCTION

Currently, it is not possible to find any rigorous evidence to support the various claims about the effects of Project-Based Learning instruction on vocabulary recall. However, the present study aims to continue investigating the Project-Based Learning method. Currently, reviews of qualitative studies conducted worldwide suggest that the Project-based Learning method could positively affect the outcome of English Language Learners by providing increased speaking time with English-proficient students (Campbell, 2012) and integrating content and skills with technology (Gulbahar Beckett, 2012)

Other lines of research recognize that vocabulary is an essential part of linguistic competence as it provides input for language skills such as speaking and writing (Nation, I., & Hunston, 2013). Education First English Proficiency Index (EF EPI) from November/2020 indicates that Ecuadorian students did not achieve good results in English Language Tests and measurements. Ecuadorian learners subdue a poor set of vocabulary words in a recent study by (Toaquiza, 2018) in a well-known high school in Quito-Ecuador.

Later, the same author realizes from the research data that the teachers from this institution apply techniques from the traditional methodology yet obtain modest results. These findings might suggest a lack of effectiveness in the current method used in the institution. Data from similar research focused on the effects of the Project-based learning method in a local high school might confirm that this may be the case. After implementing the Project-based Learning method in a local high school for six months as part of his research project, (Echeverria, 2000) asserts that 65% of the learners significantly improved their skills.

The authors of the mentioned studies claim that Project-based learning is effective and can represent a shift in current teaching paradigms. Twenty years later, Project-based learning continues to develop as a promising teaching method that could cover

the empty spaces left by traditional methodologies. Vocabulary is crucial to developing productive skills. The current international standards suggest that the conventional methods used to teach English in our country are not producing good vocabulary learning results. Finally, the Project-based learning method improves the process of teaching and learning. Therefore, it can lead to the enhancement of vocabulary knowledge.

After analyzing this context, the following question arises as a research problem: Do English Language Learners learn new English vocabulary through the Project-based Learning method in a better way? Then, a working hypothesis is the following: The Project-based learning method improves the abilities of the students to recall vocabulary words.

General objective

- To investigate the effects of the Project-Based Learning method on the student's ability to recall vocabulary words.

Specific objectives

1. To analyze the core principles of the Project-based Learning method concerning vocabulary recall.
2. To determine the main enhancements in the learners' recall of new vocabulary words due to the effects of the Project-based Learning method.
3. To create a quick guide with suggestions to implement the Project-based Learning method within the EFL class: d) To share the guide within the educational community.

The present research study analyses the performance of two groups of 22 volunteers from a local high school, relying on the experimental method's statistical power. To fully achieve this goal, it was necessary to meet the conditions required by the

individual samples t-test to take advantage of its full power and test the following Hypothesis:

- **Ha =** the Project-based learning method improves the abilities of the students to recall vocabulary words.
- **Ho =** the Project-based learning method does not improve the abilities of the students to recall vocabulary words.

The present study follows an experimental approach using two groups of participants randomly assigned. The study uses a Pre-test and a post-test to measure the effectiveness of the Project-based Learning method on vocabulary recall. The data from a pilot study determines the instruments' accuracy and selects the stimulus vocabulary items to test in the main study.

The research uses the facilities of a local educative institution, with a total of 44 participants enrolled for the main study. We carried out a Piloting study with a group of graduate students. The study's outcome will directly benefit this local institution with a set of guides to improve the current methodology based on their interests.

CHAPTER I. STATE OF ART AND PRACTICE

1.1. Vocabulary recall

It is necessary to start by analyzing vocabulary frequency and size and considering learning factors to situate the current investigation. In this regard, the book by (Nation, I., & Hunston, 2013) suggests that a relatively small number of common words appear in most texts. The research covered in this book elucidates that the most frequent 3000 to 4000 words account for about 95% of everything present in written texts. Regarding vocabulary size, the author distinguishes between “passive” (Used for receptive skills) and “active” (Used for productive skills involved in speaking) vocabulary. The main issue concerning vocabulary recall is the fact that, as human beings, we tend to forget information.

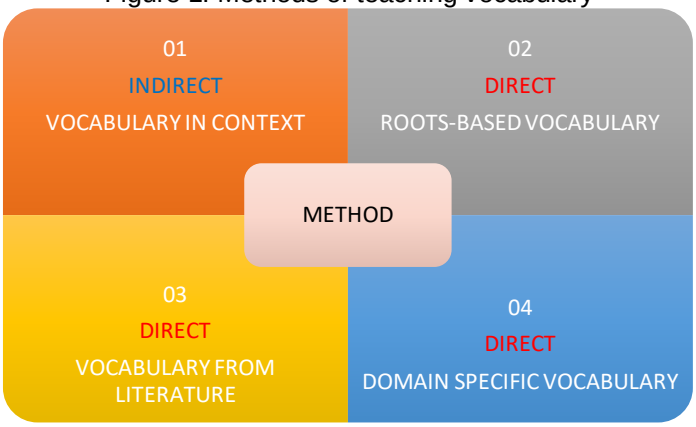
Some data analyzed by the mentioned author reports correlations of .67 and .78 between “passive/receptive” and “active/productive” vocabulary sizes in 16- and 17-year-olds. Another study revealed correlations of .72 and .89 in learners of English as a Second language (ESL) and Learners of English as a Foreign Language (EFL). “Active/productive” vocabulary size is smaller in both cases. Also, a third study added an increased level with 1000 more words using the same conditions. It reported a correlation between vocabulary size increments and “passive/receptive” vocabulary increase but “active/productive” vocabulary decrease compared to the “passive/receptive” vocabulary increment.

The data shows that an eclectic teaching style will be necessary to develop fluency in the desired language area. Vocabulary increases as the learners grow older, and more exposition to language input increases the difference between “passive/receptive” and “active/productive” vocabulary size. We can conclude that the teaching/learning style will depend on the learning objectives, level, context, and conditions for the teaching/learning practice. Regarding vocabulary frequency, the book under analysis also mentions that a learner must consider at least 3000 to 4000

vocabulary words from the most frequent word lists to learn explicitly. However, it is essential to highlight that modern methodology never teaches vocabulary words explicitly.

Research suggests that a beginner would want to spend as much time practicing with the language in authentic contexts. However, students can attempt to improve their "active/productive" vocabulary recall by explicitly memorizing the most frequent words of the target language. For this purpose, tools like frequency lists can be considered very useful. However, the coursework contents must serve as the definitive guide for the learners. Therefore, instructional coordinators need to be selective before designing a course based on a methodology. Again, special attention needs to be be given to the level and objectives to ensure good quality and pertinence in delivering the contents. The following graphic illustrates four methods of teaching vocabulary.

Figure 1. Methods of teaching vocabulary



Source: self-made

A factorial analysis of covariance (ANCOVA) at a significance of .05 with three different groups support the idea that a better learning outcome can derive from explicit learning of vocabulary words followed by practicing sessions using such vocabulary words in authentic contexts (King, 2011). These findings go in line with the suggestions by (Nation, I., & Hunston, 2013). Interestingly, input from authentic language that includes vocabulary words from the explicit learning practices produces the best results, according to this study. These studies demonstrate that learners can

improve vocabulary learning, recall, and retention from carefully traditional structured activities and modern approaches.

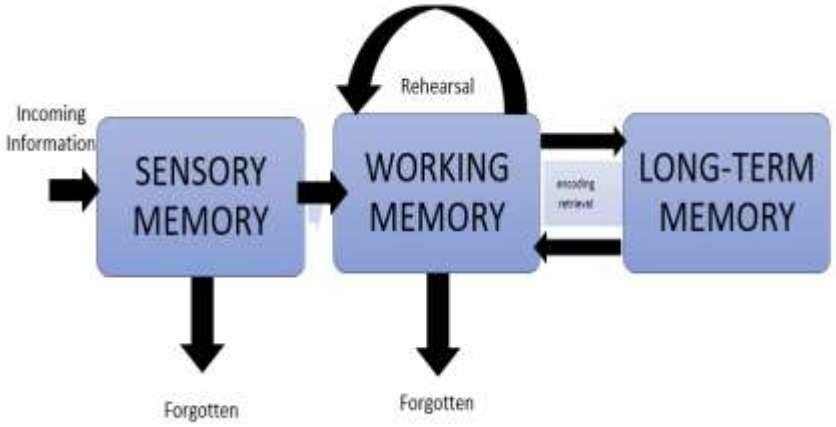
The current research requires two instruments to prepare and collect the data. The focus of this study is the measurement of vocabulary recall. Therefore, learners will need to take a carefully constructed test. Previous studies have used their instruments based on the concepts of recall and recognition. (Webb, 2007) notices that recall requires an individual to retrieve memories without the help of external cues and performs ten dependent measures for his research. The ones that concern our object of study will be the “passive/receptive” vocabulary recall of meaning and form, specifically described as a translation type of test in this study.

The test discussed in the previous paragraph aligns with the research analyzed by (Nation, I., & Hunston, 2013), which specifies that the best method to design a test to measure vocabulary recall will be to translate the stimulus items. This author specifically points out that a precise recall test will require an accurate answer. In this case, the test-taker cannot use any visual or contextual cues. A direct translation of vocabulary items from L1 is recommendable. However, concerning our interest in “Passive/receptive” vocabulary recall, it can be measured using contextual cues and the word itself in the L2 to inquire the test taker to recognize the form and provide the word’s meaning in their native language.

Some researchers analyzed data from other tests and learning methods. Such studies use cloze tests to measure the incidental learning from software like computer programs and video games. Some findings from these studies provide insights into the effects of Computer-Assisted Language Learning (CALL) programs and interactive software on vocabulary recall and retention. Interactive software like videogames and other sources of vocabulary words that use computerized interactivity can be counterproductive due to the cognitive load required for the task. The following graphic illustrates the Information processing model described in the

cognitive load theory, which is relevant for the present study due to our interest in vocabulary recall and retention that involves modern technologies.

Figure 2. Information processing model



Source: Adapted from Atkinson, R.C. and Shiffrin, R.M. (1968).

Regarding the current line of analysis, we can mention the data discussed by (Nation, I., & Hunston, 2013) and other results from more modern studies that corroborate the initial findings. To analyze the effects of a videogame on the recall and retention of new vocabulary words, a study from 2010 mentioned by (Nation, I., & Hunston, 2013) compares the results of a group of players and watchers in a controlled experiment. Random samples from various participants exposed to the same videogame are collected to compare the amount of incidental vocabulary recall and retention using immediate and delayed post-tests. The data shows an overwhelming difference of 23.27 out of 41 to 7.42 in favor of the watchers on the immediate post-test. The watchers scored 16.03 and the players 5.15 on the delayed post-test.

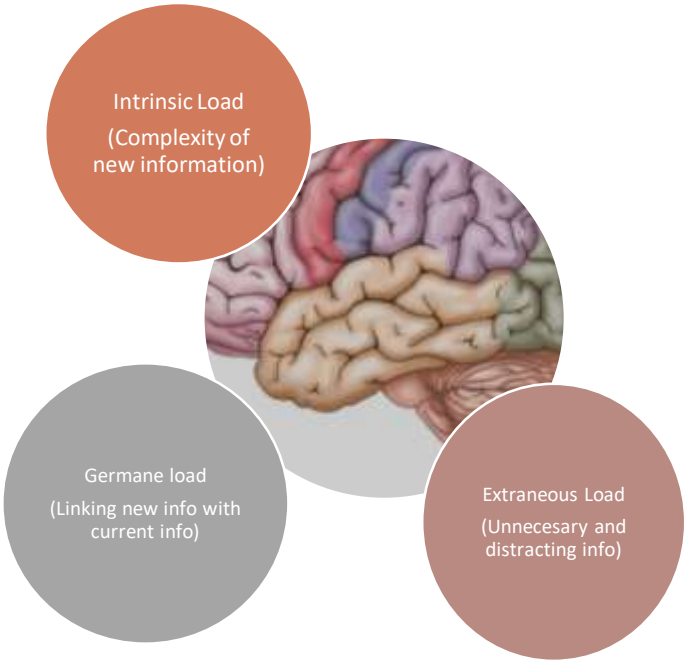
At first sight, the cognitive load imposed by the videogame appears to be the main reason for the differences observed in the tests of recall and retention. However, a closer look at the mechanics of the videogame and the test format might indicate that these results can be attributable to a simple matter of time. (deHaan et al., 2010)

analyzed their results based on a music video game. In their description of the experiment, the authors mention that the videogame called "パラッパラッパー2" (PaRappa the Rapper 2) serves as the source of incidental vocabulary learning. Their primary source of data is a written cloze test. A kind of test that is relevant to our research because it requires the participants to recall the written forms of the vocabulary words.

We can arrange the elements described in the last paragraph to the following analysis: Regardless of the cognitive load imposed by the videogame, a written test requires the test taker to recall the written forms of the words. As the progress of the videogame relies on the ability to press complex sequences of buttons, there is no time for the players to read the lyrics of the songs. These might explain the inability of some of the players to recall any vocabulary words. In this case, the present study finds relevant that the author hypothesizes that more than cognitive load, the gameplay of this videogame could be acting as a distractor ("extraneous cognitive load") for the players.

This study undoubtedly provides some initial insights into the effects of interactive media on vocabulary recall and retention. However, it is necessary to mention that interactive hardware and software are constantly evolving. One of the most noticeable differences is the connectivity present in modern videogame consoles and computers. Current videogame consoles offer online services that allow remote human interactions in various video games and software. These interactions can provide a much more effective source of incidental learning through exposure to authentic language. It is recommendable for curriculum designers participating in our study to consider the cognitive load imposed by some software and other principles of computer-based language learning. The following graphic illustrates the basic concepts described in the cognitive load theory.

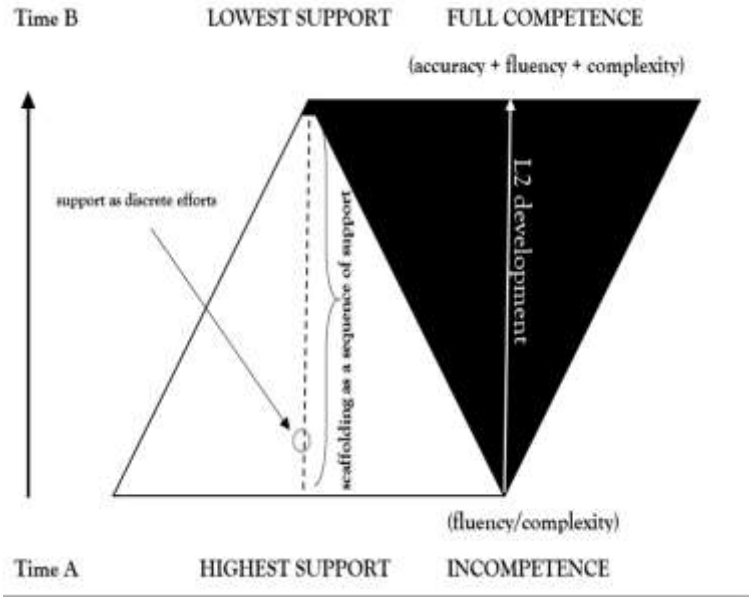
Figure 3. Cognitive Load Theory



Source: Self-made

Research on vocabulary learning reveals that exposure to input produces better results when combined with a designed process for the explicit practice of vocabulary word definitions. For pedagogical purposes, such a process needs to be carefully scaffolded by the instructor. (deHaan et al., 2010) address this point in one section by providing advice for educators. Here they present a similar model to the one proposed by (Herrera et al., 2012) that relies on scaffolding. “Activation, connection, and affirmation” phases suggested when scaffolding Content Language Teaching (CLT)-driven classes for culturally and linguistically diverse (CLD) learners seem to be present in the model proposed to teach vocabulary words using the music videogame. The following graphic illustrates a model of Scaffolding, Support, and Linguistic Competences that is relevant to the curriculum designing of the present research study.

Figure 4. Scaffolding Support and Linguistic Competences



Source: Self-made

(deHaan et al., 2010) provide suggestions based on a pre-task, during-task, and post-task model. These suggestions focus on reducing the cognitive load imposed by the videogame. However, they also include scaffolding techniques that provide explicit vocabulary practice. For instance, in one section, the author recommends using a dictionary to find the meaning of some vocabulary words. Also, the advice from the data analysis coincides at various points with the previously mentioned findings from (King, 2011) and (Nation, I., & Hunston, 2013). Therefore, fostering the belief that learners achieve more effective recall and retention of vocabulary words which is a relevant topic for our study, by connecting the explicit vocabulary practice with input from authentic language.

Regarding the current line of discussion, the following question arises; What amount of exposure to meaningful language produces better recall and retention? The experimental study by (Webb, 2007) aims to answer this specific question. The author applies ten different tests to measure vocabulary learning. Data from the tests called “Receptive recall of meaning and form” (RRM) and “receptive knowledge of meaning and form” (RM) is particularly interesting for the current analysis. Additionally,

“receptive knowledge of orthography” (RO) and the overall results from the analysis of variance and multivariate analysis of variance performed in this study deserve a close look as they provide relevant information about vocabulary learning.

In this study, the author measures improvement in 0 to 10 encounters (E) with the target vocabulary words. The results from the tests reveal a clear increment in all measures. However, “receptive recall of meaning and form” (RRM) achieves the lowest results independently of the number of encounters (E). For instance, at (E10) (mean and σ) from (RRM) is only (2.88 σ=2.40) compared to (8.75 σ=1.03) from (RO). In comparison, at (E1) (mean and σ) from (RO) is (6.70 σ=1.72) while (RM) is (5.78 σ=2.09). In fact. Of the ten dependent measures, (RRM) is the hardest for these learners at any number of encounters, while (RO) is the easiest. The correlations from the one-tailed test also reflect the accuracy of each dependent measure at a .01 level of significance.

In the case of the dependent measures from the current study, the productive ones are more sensitive because of their nature. As previously discussed, measuring recall requires a demanding and exact type of test. Therefore, Receptive Recall of Meaning and Form (RRM=0.43) appears to be accurately assessed by the correlation coefficients in this study. In comparison, Productive Orthography (PO= 0.50) also seems to be very sensitive to the measures, and Receptive Knowledge of Meaning and Form (RM=0.23) is the less sensitive. Finally, the present study finds relevant that the analysis concludes that at least ten repetitions or more are necessary to produce significant gains in incidental vocabulary learning in these participants.

It is possible to say then that the translation test is a sensitive and accurate method for measuring vocabulary recall. Unfortunately, the findings regarding the effects of repetition on vocabulary recall present some limitations. Since the study uses a controlled experiment to obtain data, a lack of ecological validity prevents it from providing conclusive results. This limitation would be the most noticeable because it makes it difficult to verify the validity of the affirmations. Overall, the initial data is a

good starting point. In the case of computer software, a variety of numerous studies offer the opportunity for meta-analyses or systematic reviews. Regarding the instrumentation part of the present research, the measures under analysis contribute to validating the translation test accuracy.

Regarding the study (Nation, I., & Hunston, 2013) about incidental learning from a music videogame. (Klimova & Kacet, 2017) identify other five experimental studies conducted similarly and analyze their results. Four of the studies measure the effectiveness of computer games. One of them uses an online game. The samples from these studies come from diverse groups. Most of them date from 2014. The participants are males and females from USA and Iran. Ages vary from 6 to 40 years old. The number of participants varies from 25 to 57 subjects. These studies conclude that computer games have positive effects on vocabulary acquisition. Therefore, we can conclude that carefully selected software is beneficial for learners, which is relevant to validate the technological component of the methodological design for the current research.

In this line of discussion, we can speculate about the advantages of modern apps designed to promote language learning. It may be accurate to teach new vocabulary through every app or software which do not involve pressing complex sequences of buttons. Nowadays, modern apps allow teachers to reinforce incidental vocabulary while fostering the diverse learning interests of their pupils while opening the door for new lines of research. Examples of music software that do not incorporate complex mechanics include StarMaker for cellphones or SingStar for consoles. Online games that allow multiple interactions include the popular and criticized FreeFire for cellphones or Among Us for consoles and computers, but the most interesting incorporate the modern development of Artificial intelligence (AI) like Replika for Cellphones or Minecraft for consoles and computers. This information is relevant to our research because it can help when selecting the best applications to be used as part of the Project Based learning methodology applied during the intervention phase. Hence, the following adjusted table provides insight into the correct integration of

advanced Computer Assisted Language Learning Technologies and Language Learning contents to develop a model of Scaffolding in Internet-based ELF classes:

Table 1. Model of Scaffolding in Internet-based ELF classes.

Functions	Intentions	Strategies
Cognitive support	Cognitive structuring	Marking critical task features, elaboration prompting, meaning-based negotiation, critical debate, reviewing and repeating of tasks, modeling, writing prompt, providing hints
	Reduction of the degree of freedom	
Linguistic support	Increased exposure	Enhanced input, recast, repetition, prompting for elaboration, exchanging experience in language use, small talk, focus-on-form, post-lesson reflection, model essay/talk, translanguaging.
	Language production assistance	
Affective support	Recruitment	Encouraging, providing constructive feedback, providing reward system, explaining and listening to negative emotions, pre-task activities, and discussions.
	Contingency management/ frustration control	
	Learners' pre-engagement	
Metacognitive support	Direction maintenance	Problematizing and disagreeing with common solutions to tasks, describing how learners think, proving argumentative template, modeling think-aloud process.
Technical support	Ensuring comfort and ease in using the system	Providing visual cues to support technical use, providing communication forms for students to request help from teachers and friends, administering real-time interactive help page, providing task-orientated suggestions with technological tools, giving feedback on how to use tools effectively for group work/presentation, instructing students on how to navigate the software, setting up hypermedia-embedded interactive systems that students can consult.
Content scaffolding	Activating interdisciplinary and translinguistic prior knowledge to promote task completion	Brainstorming, recalling prior schemata, content evaluation prompting, mapping of lessons, collaborative summary of lesson content, adding, elaborating, and correcting information, providing feedback and correction for written and
	Organizing and classifying knowledge	oral articulation of task response, supporting concept transferring between L1 and L2, feeding back and advising on content delivery
	Shaping effective content exchange	

Source: adapted from https://doi.org/10.55593/ej.26101a1

1.2. Gold standard Project Based learning

Contemporary challenges like the necessity to foster independent study time among the learners are forcing the educational system to promote effective distance & remote learning. According to (Filippatou & Kaldi, 2010), Project-Based Learning (PBL) is considered the response to those challenges. It can be particularly effective for indirect and interactive instruction and goes hand in hand with experiential learning and independent study skills. (Roessingh & Chambers, 2011) mentions that Project-Based Learning, which is related to our research, is a relevant instructional approach grounded under the social constructivist paradigm.

The study by (Takeda, 2016) analyzes the characteristics of Project-Based Learning instruction concerning the new educational standards for a globalized society. Other than tackling the new requirements and fostering the skills discussed in the previous paragraph, the findings of this study suggest that Project-Based Learning may help the students to acquire a foreign language more naturally. (Musa et al., 2012) support these claims affirming that through Project-Based Learning, students genuinely engage in active listening and develop speaking fluency and teamwork skills.

Regarding technology, (Martí, José; Heydrich, Mayra; Rojas, Marcia; Hernández, 2010) mention that Project-Based Learning goes hand in hand with technological tools used to share knowledge and promote collaborative learning. Moreover, the research by (Shadiev et al., 2015) about teaching within an online authentic learning environment with Project-Based Learning instruction suggests that Cross-Cultural experiences promoted by this method foster motivation among the students. Furthermore, the so-called “asynchronous cyber-classroom” used to implement the Cross-Cultural insights can help prepare the students to better deal with the challenges of abroad education.

As previously discussed, modern times require the students to become less dependent on their teachers. It is worth mentioning that computer-assisted learning

and Project-Based Learning instruction promote self-efficacy. (Gai Mali, 2016) findings confirm that this method increases the effective use of social network applications like WhatsApp and Facebook. In this line, ANCOVA statistical analysis performed by (Mahasneh & Alwan, 2018) on their experimental group (N. 37) attributes 24% of the variance (F=24.902) affecting self-efficacy of the participants exclusively to the effect of the Project-Based Learning method.

In contrast to the benefits, (Medina Nicolalde & Tapia Calvopiña, 2017) discussed the challenges that applying such a methodology may impose on the instructor and the learners. The design, planning, execution, and evaluation of the project will be better with the guide and help of the teacher who gives ideas and recommendations to conclude the project. Also (McCarthy, 2010) indicates that the Project-Based Learning instruction can show little or no impact on the learner's motivation if the projects are not guided and combined with adequate resources, and executed in the correct learning environment.

As mentioned by (Rahman et al., 2011), Project-Based Learning instruction can be complex to implement in certain circumstances. However, it is possible to overtake the issues with the clever use of several available resources. Unfortunately, even when Project-Based Learning is correctly applied, there is no conclusive research to endorse it as a suitable method to improve the current teaching practices. According to the compilation of literature made by (Condliffe et al., 2017), literature concerning Project-Based Learning instruction points out that it is a "promising" methodology. Unfortunately, there are not numerous research studies to authenticate its true potential. Therefore, in the present study, the intent will be to demonstrate what makes Project-Based Learning instruction a suitable teaching method.

It is necessary to determine how to integrate Project-Based Learning instruction within the English language class. To enhance the effectiveness of the Project-Based Learning instruction, teachers must consider some elements for the integration of Project-Based Language Learning instruction with technological tools like some form

of Computer-Assisted Language Learning (CALL). It needs to be well-conceived, meaningful, purposeful and aligned with the course goals. According to (Dooly & Sadler, 2016), technology and carefully scaffolded activities help learners develop speaking competencies. Nevertheless, more relevant to this research, this author highlights that the acquisition of lexicon related to the topics can derive from such delivery of contents.

From the numerous advantages discussed in the Project-Based learning instruction features' analysis, one that can be particularly relatable to Project-Based Language Learning is the opportunities for exposition to authentic language contexts. (Lam, 2011) mentions that Project-Based learning instruction allows English learners to practice the language in real contexts. Thus, allowing them to improve their skills more naturally. Interestingly, the same author provides a set of steps to ensure a certain degree of quality that the present study will analyze in the following paragraphs.

The study under analysis mentions that it is necessary to integrate the projects' goals with the curriculum standards. Also, some factors to consider during the implementation of the projects are time, materials, and assessment. Other factors like collaboration and real-world connection are particularly relevant to this analysis because they foster communication and vocabulary development. The real-world connection is the means to let them gain skills in culture and comparisons. In this context, collaboration is the opportunity students need to communicate interpretatively. Also, it helps them to acquire information through sustained inquiry in the target language.

Culture and comparisons are the abilities to spend time thinking about interculturality. Having these abilities help learners to develop the pragmatic skills they will need to navigate their interactions in the target language. For this purpose, they will need skills typically developed in language classrooms. Basic language projects can focus on grammar and vocabulary. Then the projects can be refined by connecting

communicative functions with academic disciplines or career focuses. It is possible to achieve complete meaningful learning by linking these ideas to meaningful cultural contexts outside the classroom. Therefore, giving opportunities for critical thinking within the context of communication.

In addition, (Kalabzová, 2015) recommends going through some steps to prepare and create the projects: Initially, it is necessary to agree with the students on the topic of the project. Both teacher and students will discuss the product and details. Next, this study recommends a phase of preparation and application of data collection techniques, followed by a compilation and analysis phase. Finally, the study presents the details of applying a presentation and assessment phases. The final steps involve the preparation and presentation of the final product. The project culminates with the reflection by the students as a form of assessment.

According to the literature analyzed so far, it is necessary to consider that the instructor can implement the phases of preparation, realization, presentation, evaluation, and the set of steps discussed in the last paragraphs. Some of the information analyzed is not presented equally in all studies. Ergo, the instructor must be able to accurately develop a plan to adjust these phases, steps, technologies, and tools according to the needs of the learners. Educators need a certain degree of experience to plan and conduct a project with their students. Everyone interested in creating a good project must identify the four following phases:

1. Entry event: Organize an entry Event and write a driving Question

2. Organize a session to clarify doubts and build skills to help the learners understand the driving question.

3. The learners start developing and giving feedback about the products.

4. The project must include a presentation phase where the learners present and self-assess their products.

As it is crucial for the sake of this research, we need to integrate technology and content during the implementation of a project to ensure the correct application of the Project Based Learning method. Therefore, the following adjusted chart provides insight into the proper integration of advanced Computer Assisted Language Learning Technologies and Language Learning content to develop a framework for a unit plan based on a project.

The improved version of a Project-Based Learning instruction unit plan shown in the chart features a clever integration of updated theories and technologies. As a brief description of each column, we can point out the integration of recent theories like Gardner's multiple intelligences theory. This unit plan also seeks to teach retention and recall of vocabulary words. The teaching style includes all features of the new learner-centered approaches. In addition, it integrates technology to promote the development of the four language skills.

Table 2. Adapted Unit Plan Framework.

Content	Language	Skills	Technology
Select a topic based on the interests and profiles of the learners. **Finding appropriate content for the selected topic.** **Reviewing contents** **Preparing a presentation.** **Evaluating the presentations.**	Selecting relevant words Definitions of relevant terms Sequencing language Means/end language	Searching the internet Writing Skimming and Scanning Using dictionaries Synthesizing information Paraphrasing Editing/Proofreading Revising Transcribing Listening Note-taking Collaborating Outlining Grouping Creating Bibliographies Choosing and evaluating	World Wide Web Grammarly Google suite Microsoft Teams and office Meta Languages teaching AI

Source: Modified from (Beckett & Slater, 2017)

The learners can develop a project in two or more weeks. The instructor needs to plan the project to guide the process. The Plan must start with the project overview. The instructor includes the general data: The project title, driving question, grade, level, subject, the time frame, and the products. Then the instructor must write a section with the Learning goals, which can include the curriculum standards, a list of the critical vocabulary, a list of the literacy skills for the development of the project, a list of success kills to develop, a list of rubrics or assessment tools.

Finally, the edited unit plan presented previously only illustrates the model of planning that follows all theories discussed throughout the section. According to (Kalabzová, 2015), it is better to create a detailed plan that allows the teacher to adjust various elements according to the characteristics of the learners. In addition, (Dooly & Sadler, 2016) point out that this systematic approach powered by the new technologies can produce outstanding results regarding targeted vocabulary learning. Also (Baş & Beyhan, 2010) indicate that learners enjoy developing the projects by integrating Gardner's multiple intelligences theory.

In 2010, the educational initiative known as the common core set new educational skills for the American k-12 students in English-language arts and mathematics. The project-Based learning method was also adjusted to focus its features on acquiring the skills described in the common core. Teachers started to refer to the new features of the method as gold standards. The discoveries of gold deposits that resulted in the rapid growth of miners and fortune seekers in the 19th century popularized the phenomena known as the gold rush. As a result, the word gold is currently associated with everything considered prolific in many areas of the United States of America. In other words, the new standards featured in the project-based learning method due to the Common Core State Standards Initiative or simply Common Core receive the name of Gold Standard Project-Based Learning.

Nowadays, the practices involving projects must meet the gold standard. Otherwise, they might represent a loss of time. The instructor must specify the milestones for the

project. In other words, the expected achievements for each session. The instructor must create a section to specify the achievements of each milestone, the assessment, and define a flexible calendar according to the needs of the learners. It is a common mistake to confuse group activities with Project-Based learning activities. In contrast, this research study bases its suggestions and treatment application entirely on the standards of a Gold Standard Project-Based learning model. Therefore, it sought to test the new features of this method concerning vocabulary recall. The following graphic illustrates the elements of a Gold Standard Project-Based learning model. This information can help us understand the method before its application phase. Thereupon, it poses a high degree of relevance to the present study.

Figure 5. Elements of a Gold Standard Project-Based Learning model

Source: Self-made

1.3. Project-based learning on vocabulary recall

It is opportune to consider the previously analyzed results to understand the effects of the Project-based Learning method. Thereupon, the previous summary of the different findings concerning vocabulary learning is an informed point of departure for presenting, comparing, and contrasting the new data related to the effects of the Project-based Learning method. It was made clear that the repetition of vocabulary words enhances the learner's ability to recall these vocabulary words. Therefore, a teaching method that fosters productive skills among learners must prioritize dynamic, implicit, and explicit learning of vocabulary words. Such a method uses a model in which the learners construct their knowledge. It is relevant for our research that this model also goes in line with the Project-based learning method approach.

Teachers need to reflect on the needs of their students to provide feedback. For this purpose, they need to pay special attention to the individual characteristics of each learner. Some learners need extra attention to stay motivated during the teaching-learning process. Thus, promoting the right motivation among the learners is necessary for fostering learning. To that end, using meaningful content and relevant materials is recommendable to improve the outcomes. In this regard, promoting independent study time for the learners to build knowledge, allowing the instructor to offer a variety of topics to foster motivation, and the possibility of carefully developing the projects are features of the Project-Based learning method. At this point, it is noticeable that those features have a positive effect on vocabulary recall which is one of our variables.

Data from an experimental study by (Alsamani & Daif-Allah, 2015) reveals that Project-Based Learning instruction fosters the development of new study habits for learners. This study affirms that the students' motivation improved because Project-Based learning instruction enables the instructor to provide a relaxed environment. Using SPSS for Windows Version 10.0, this long-term study of 12 weeks also analyzed the effects of Project-Based Learning instruction on developing target

vocabulary words. The results show a large effect size (d=7.8) and statistically significant differences in favor of the experimental group in the post-tests at a 0.01 level. Therefore, confirming the various positive effects of Project-Based Learning instruction on vocabulary recall.

Oher characteristics of this method seem to align with some of the most recognized modern language-learning theories, according to the authors of this experimental study (Kimsesiz et al., 2017) emphasize the motivational nature of the Project-Based learning method in their analysis. They support these claims by referencing other research studies in the discussion section. Although, the data is still not conclusive. Everything seems to indicate that Project-Based learning instruction naturally produces an active learning process of scaffolding knowledge when applied to English language classes. Regarding vocabulary recall, the level of engagement achieved with this method seems to be the reason for the better results observed in the immediate and delayed post-tests.

The authors of the mentioned studies claim that Project-based learning is effective and can represent a shift in current teaching paradigms. Twenty years later, Project-based learning continues to develop as a promising teaching method that could cover the empty spaces left by traditional methodologies. Vocabulary is crucial to developing productive skills. The current international standards suggest that the conventional methods used to teach English in our country are not producing good vocabulary learning results. The Project-based learning method improves the process of teaching and learning. Therefore, it can lead to the enhancement of vocabulary knowledge. This information is relevant to our study because it attempts to test the effectiveness of The Project-based learning method.

According to the previous findings, the effects of Project-Based Learning instruction on Vocabulary Recall are dependent on two measurable factors. The first one is the implementation of the method. Such a method must foster the motivation of the students. The other involves using the most appropriate resources and including the

correct use of technology. (Shafaei & Rahim, 2015) use teaching and testing as measuring instruments for their experimental study. Then, they analyze the learning process and the final product through descriptive and inferential statistical measurements. Based on the theoretical analysis for their research, these authors recommend teaching and testing a set of 6 vocabulary words per week. Retention of such vocabulary words is measured using delayed post- and delayed-delayed- post-tests.

The research studies mentioned follow a similar process to collect and analyze their data. The results reveal that the Project-based Learning method leads to better results than the traditional methods. However, a close analysis of the discussions made by the authors suggests that the Project-based Learning method improved the outcomes in a slightly different way in each case. While (Kimsesiz et al., 2017) emphasize the involvement provided by the class organization, (Shafaei & Rahim, 2015) attribute the success to the research opportunities derived from using the method. The details of these studies will contribute to understanding the process behind the implementation of the methodology.

The study by (Shafaei & Rahim, 2015) provides insights on determining the main effects of the Project-Based Learning method on recalling new vocabulary words. The study bases its principles on experimental analysis to answer its research question. It also follows the process applied by other researchers. They explain their field intervention clearly, using graphics and schemas. A 5-week treatment with 30 vocabulary words selected to teach takes place. They describe the results using descriptive statistics. Then, they use these results to perform an Independent Samples t-Test to validate the effects of the intervention on the experimental group. This process concerns our study because we intend to replicate the same steps to verify our hypothesis.

The authors of this study selected the vocabulary items following these criteria: The first element into consideration is the student's knowledge. The other is the contents

of the modules used in the institution of the intervention. However, the selection involves different vocabulary categories. The effects of the method are measured later using a t-Test. We can conclude that this simple but effective experiment can be perfectly replicable in the same conditions for our study. The only caveat is the requirements of the test. Random samples and a constructed environment must be present to ensure the full power of the statistical formula. However, a short-time experiment can provide enough data to measure the two variables accurately.

CHAPTER II. METHODOLOGY

2.1. The Pre-test Post-test design

The present research study used the facilities of a local high school to conduct a piloting phase and an experiment. The researcher contacted the high school principal to explain the purpose of the study and asked permission for the students, teachers, and parents to participate in the study. The field observations from a piloting phase provided the information to design the main study and refine the data collection and analysis instruments. The validity of these instruments was also tested during the piloting phase in the same high school by testing and selecting the course topics and the stimulus vocabulary items to be used in the main study. Each participant in the main study received treatment in the form of a free English course after the class hours using two classrooms of the same high school.

The present study seeks to analyze the effects of the Project-Based learning method by comparing two groups of students. For this purpose, we use quantitative data analysis to measure the differences between the two groups. The present study is experimental. The research follows the steps of the scientific method: Observation, research, the formulation of a hypothesis, an experiment, the validation of the hypothesis, conclusions, and the sharing of the results.

The study analyzes the data from 44 participants randomly assigned to experimental and control groups. The instruments are selected and refined using a piloting study. The two main instruments for data collection and analysis are a vocabulary recall pre-test and post-test and the independent samples t-test computed through “The jamovi project Computer software. Version1.6 (2021)”

Research Modality: socio-educational modality.

Research depth level: analytical. It helps to identify a claim and determine whether it is true or false. It also analyses data to confirm a hypothesis (Omair, 2015).

2.2. Effects of project-based learning on vocabulary recall

This study considers methods used in education research like tests, observations, and interventions as data collection methods. Two main instruments served for data collection based upon the conceptual framework of the investigation: a test and an experiment. Previous research studies and the theory to apply these instruments proposed by (Nation, I., & Hunston, 2013). provide the theoretical background for validating such instruments.

Additionally, the instruments were carefully selected and piloted to ensure reliability and validity. Three external professionals in the area analyzed these instruments to verify their validity and reliability. The researcher selected the lexical items used to measure vocabulary recall from the student's English book. One teacher used the English activities from the books to teach the control group. In contrast, the other teacher used a set of activities and technology applications from the Project-Based learning method to teach the experimental group.

The main experimental study consisted of the administration of two tests and treatment by two teachers and the researcher. The treatment was applied using the Project-Based learning method and the traditional method for teaching English in the institution. One teacher applied the Project-Based learning method to teach the experimental group of students, while the other teacher applied the traditional method for teaching the control group**.**

A six sessions coursework was planned and taught based on the contents and planning of the student's English book. The same topics were taught through Project-

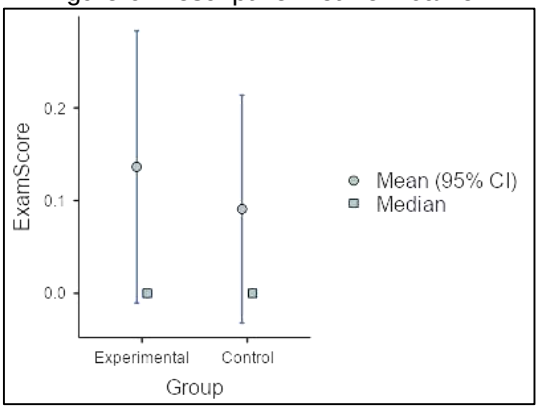
Based Learning but based on the goals of the curriculum for the selected unit. The selection of content does not match the institution's academic calendar. It was selected according to students' intellectual capabilities and interests and presented to the participants in the form of free vocabulary coursework.

After piloting the instruments and adjusting the stimulus vocabulary items, we administered the pre-test to both groups (N. 22) participating in the main study. Before the intervention, the volunteers from the experimental group scored a higher grade on the vocabulary recall pre-test (M=0.136 points, SD= 0.351) than the control group (M=0.091 points, SD= 0.294). The following “Descriptives” table and plot from “jamovi” summarize the results of the two groups:

Table 3. Pre-test means from Jamovi

Group Descriptives						
	Group	N	Mean	Median	**SD**	**SE**
ExamScore	Experimental	22	0.136	0	0.351	0.075
	Control	22	0.091	0	0.294	0.063
Source: Self-made						

Figure 6. Descriptive Plot from Jamovi



Source: Self-made

The experimental group scored slightly better than the control group. However, the homoscedasticity of the sample is not compromised. Levene's test of homogeneity of

variances is (p=.353). Therefore, it is not significant, and there is no reason to assume differences in the variances of the two samples. The following table extracted from "jamovi" summarizes the results:

Table 4. Levene's test from Jamovi

Homogeneity of Variances Test (Levene's)				
	F	df	df2	p
ExamScore	0.881	1	42	0.353

Source: Self-made

After six treatment sessions, an "immediate recall post-test" revealed that the experimental group scored a higher grade than the control group. Any of the methodologies achieved the expected outcomes; this can be attributable to the short time of exposure to the vocabulary words. It is essential to highlight that both teachers involved in the study attempted to focus on teaching the contents and skills from the unit following the techniques of each method.

The instructors performed the assessments required to ensure the quality of the teaching sessions. However, the incidental vocabulary gained from the sessions was measured only by the researcher. This procedure allows the researcher to determine the main effects of each methodology and provides more ecological validity to the study. In this regard, the Project-Based learning method seems to have better effects during the first sessions due to its scaffolding process that recommends the explicit teaching of vocabulary words at the beginning of the project. The process suggested by the (Buck Institute for Education, 2017) appears to incorporate elements that affect the teaching process concerning incidental vocabulary gains, among other features. The following table from "jamovi" summarizes the final scores from both groups:

Table 5.Post-test means from Jamovi

Group Descriptives						
	Group	N	Mean	Median	SD	SE
ExamScore	Experimental	22	1.409	1.5	1.333	0.284
	Control	22	0.182	0	0.664	

Source: Self-made

After comparing the averages from the pre-test and post-test results, both methodologies achieved low results. The following table summarizes the means from the pre-test and post-test:

Table 6. Means from the Pre and Post-test

	Group	**N.**	**Mean**	**SD**
Pre-test	Experimental	22	0.136	0.351
	Control	22	0.091	0.294
Post-test	Experimental	22	1.409	0.284
	Control	22	0.182	0.142

Source: Self-made

The project-Based Learning methodology increased the ability of the participants to recall some vocabulary words after the intervention. However, the effect is low. A mean score of 1.409 out of 10 points makes it difficult to attribute the improvements to the method. The student's t-test helped to investigate if the difference was statistically significant. The student's test (t=3.865) at 99% confidence reveals that the experimental group achieved significant gains attributable to the method.

In this case, an additional calculation of the mean differences can help investigate if these improvements are attributable to the Project-Based learning method. The effect size statistic from Cohen's d at a 95% confidence aids in supporting the power analysis results. In this case, a considerable statistical magnitude (d=1.165) reveals

that the gains of the experimental group are attributable to the effects of the method. The following table from "jamovi" summarizes these results:

Table 7. Effect size and t-test results

Independent Samples T-Test								
							95% Confidence Interval	
		Statistic	df	p		Effect Size	Lower	Upper
ExamScore	Student's t	3.865	42	<.001	Cohen's d	1.165	0.468	1.842

Source: Self-made

2.3. Research Proposal

Introduction

This study seeks to analyze how the students can learn and recall new English vocabulary words. Some methods from the current approach seem to produce limited results in developing productive skills due to vocabulary learning issues (Toaquiza,2018). Historically, language learners have struggled to use new vocabulary words, especially in conversation. Therefore, new methods from approaches based on the recent findings from the linguistics field emerged and replaced the more traditional ones.

Since old and new approaches already analyze from different perspectives aspects like the grammar of a vocabulary word, usage, scope, and ultimately if the vocabulary word can be recognized and used in context. For the sake of this study, it is not considered of particular benefit to analyze those aspects. Instead, it assumes that a learner gradually acquires vocabulary words. Therefore, it assumes the validity of the main theories of Communicative Language Teaching (CLT). This study focuses on determining those words from lessons that a student does not know. Then, using that

data to develop a set of statistics to accurately measure the efficacy of the methods under analysis to promote vocabulary recall skills within the language learners.

Objective

This project aims to investigate the effects of the Project-Based Learning method on the student's ability to recall vocabulary words. These results allow us to create a quick guide with suggestions to implement the Project-based Learning method within the EFL class. Finally, sharing the guide within the local educational community will be possible.

Problem statement

It is possible to identify the main issue concerning vocabulary recall as the fact that, as human beings, we tend to forget information. Forgetting has been historically considered a big issue in language learning. Therefore, vocabulary learning issues have been the subject of numerous analyses, including descriptive, pedagogical, methodological, and others. A careful review of the literature regarding the topic revealed that the theory of language acquisition from a considerable amount of exposure to authentic language by Stephen Krashen cuts through many of the issues generated by this various analysis.

Unfortunately, a close look at the dynamics of the current educational institutions reveals that they do not enable enough time for exposure to authentic language. Then, the present study aims to determine the effects of a learner-centered method that emphasizes autonomous learning like the Project-based learning method. Previous research studies by (Condliffe et al., 2017) on the effects of the Project-based learning method on various areas of knowledge reveal that it is only one experimental study regarding vocabulary recall and retention. Therefore, locally duplicating this study can provide more quantitative data to support previous findings

on vocabulary recall skills among language learners and create a consistent guide for applying this methodology.

The gold standard project-based learning: quick guide to design a project

Phases of a project

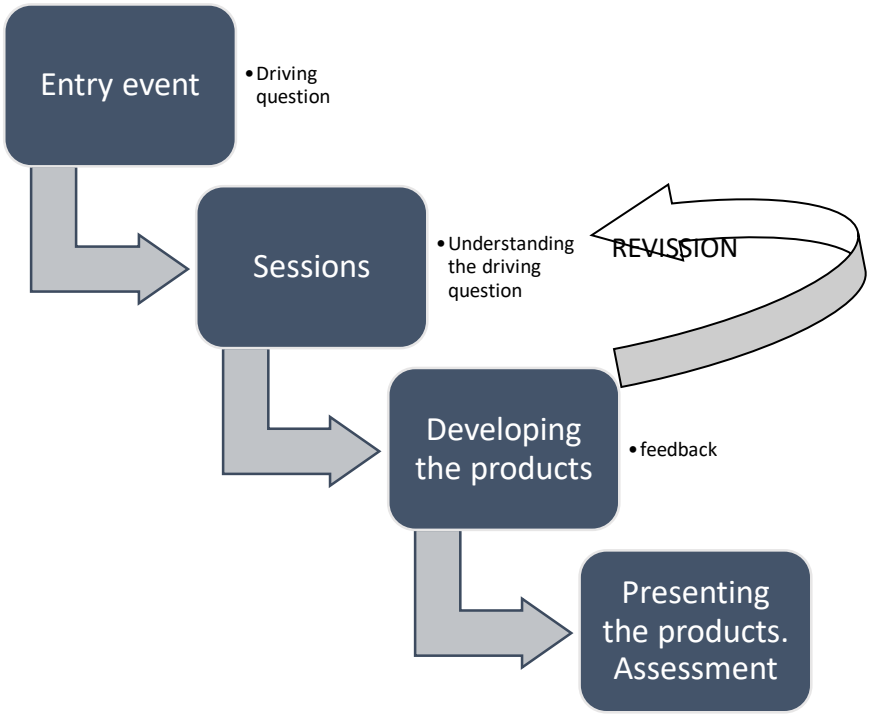
Teachers interested in creating projects need to familiarize themselves with the Project-Based Learning method. Therefore, educators need a certain degree of experience to plan and conduct a project with their students. Projects must be carefully designed by following a process. Teachers and instructors decide the elements of a project prioritizing the characteristics of the learner, resources, and time. However, it is necessary to meet certain standards to avoid mistakes during the implementation of the projects.

It is a common mistake to confuse group activities with Project-Based learning activities. To avoid such mistakes, the instructor must create a section to specify the achievements of each milestone, the assessment, and define a flexible calendar according to the needs of the learners. It was previously mentioned that the practices involving projects must meet the gold standard. Otherwise, they might represent a loss of time. Everyone interested in creating a good project must identify the four following phases:

- Entry event: Organize an entry Event and write a driving Question
- Organize a session to clarify doubts and build skills to help the learners understand the driving question.
- The learners start developing and giving feedback about the products.
- The project must include a presentation phase where the learners present and self-assess their products.

- The following graphic represents the phases involved in the process of conducting a project:

Figure 7. Steps of PBL



Source: Self-made (Ortega,2022)

The most effective form of project-Based learning instruction meets the gold standard criteria. The following elements must be present in the projects to improve the effectiveness of the method:

- The projects must be connected to the reality of the learners and must aim to solve a real problem.
- Every project must attempt to promote success skills, including critical thinking/problem solving, collaboration, and self-management among the learners.

- The instructors must start by formulating an open-ended question to be answered by carrying out the project.
- The process must be an active exercise of inquiry that requires the learners to formulate and answer questions, use different learning tools, and collaborate to solve problems.
- The projects must allow the learners to make certain decisions, create their schedules and choose the amount of time for developing the project.
- The projects' goals must reflect the academic goals from the current curriculum.
- The teachers must assess their students' progress and learning and not only the products of the groups.

Difficulties in implementing the projects

The implementation of the projects poses some difficulties. However, novel teachers unfamiliar with the method can use guides currently available on the internet. For instance, the (Buck Institute for Education, 2019) provides a rubric for teachers that highlights these difficulties. Novel teachers must try to observe the following guidelines:

- The project only includes some essential elements, but it needs to include everything present in the rubric designed to grade the final product.
- The project can fail if the planning developed for assessing scaffolding activities is not detailed. The teacher is not using a detailed calendar of events to conduct the project.
- All of the resources needed to conduct the projects must be detailed and obtained in advance.
- The instructor needs to plan the activities so the project calendar does not allow too much or too little time or does not respond to student needs.
- The scaffoldings and techniques used during the session design must answer the project's students' questions.

- The student's input must be taken into account to create the project's goals.
- The instructor must present the driving question at the project launch and generate this question to guide inquiry or product development.

Scaffolding

The Project-Based Learning method offers the possibility of scaffolding the contents for English as a Foreign Language (EFL) learners. The scaffolds for the Project-Based Learning method are the main characteristic that significantly improves vocabulary recall. The following relevant strategies from the (Buck Institute for Education, 2019) are suggested for the implementation of the Project-Based Learning method in the English as a Foreign Language (EFL) classes:

At the entry event

- Explicitly teach and define content-related vocabulary during the discussion of the entry event.
- Create and maintain a vocabulary wall for academic language associated with the project.
- Use entry events to introduce students to different types of texts and discuss the conventions and purposes of text types.
- To provide more opportunities for low-stakes speaking and listening practice, have students discuss the entry event and need to know in pairs or small groups before engaging in a whole-class discussion.
- Avoid (or explicitly teach) colloquialisms and idioms in project-related resources (e.g., entry events, driving questions, rubrics).
- Use photos, videos, physical objects, or other visual aids to help build context for learners at all levels of language proficiency.
- If the entry event is an "experience" (e.g., field trip, hands-on activity), have students use graphic organizers to organize their thoughts or write

keywords that can serve as memory triggers. A scavenger hunt is a good strategy for a field trip.

- Use a camera, if possible, for students to capture experiences during the entry event or allow students to create visuals that they can later use to recall information and develop connections.

During the sessions

- Use observations and written tasks such as reflective journals to assess student progress on language development targets.
- Have students develop personalized illustrated dictionaries to keep track of essential vocabulary.
- Provide texts adapted to the level of the learners during work time.
  Use various grouping strategies (heterogeneous, language level, pairs, self-selected) strategically throughout a project.

Preparation for the presentation of the final products

- Co-create rubrics for final products and success skills with students. Both teachers and students must use the rubrics for assessment and reflection, and the same rubrics will serve for formative and summative assessment.
- When appropriate, provide students with writing samples and text frames to teach them about text and language conventions.

Presenting the final products

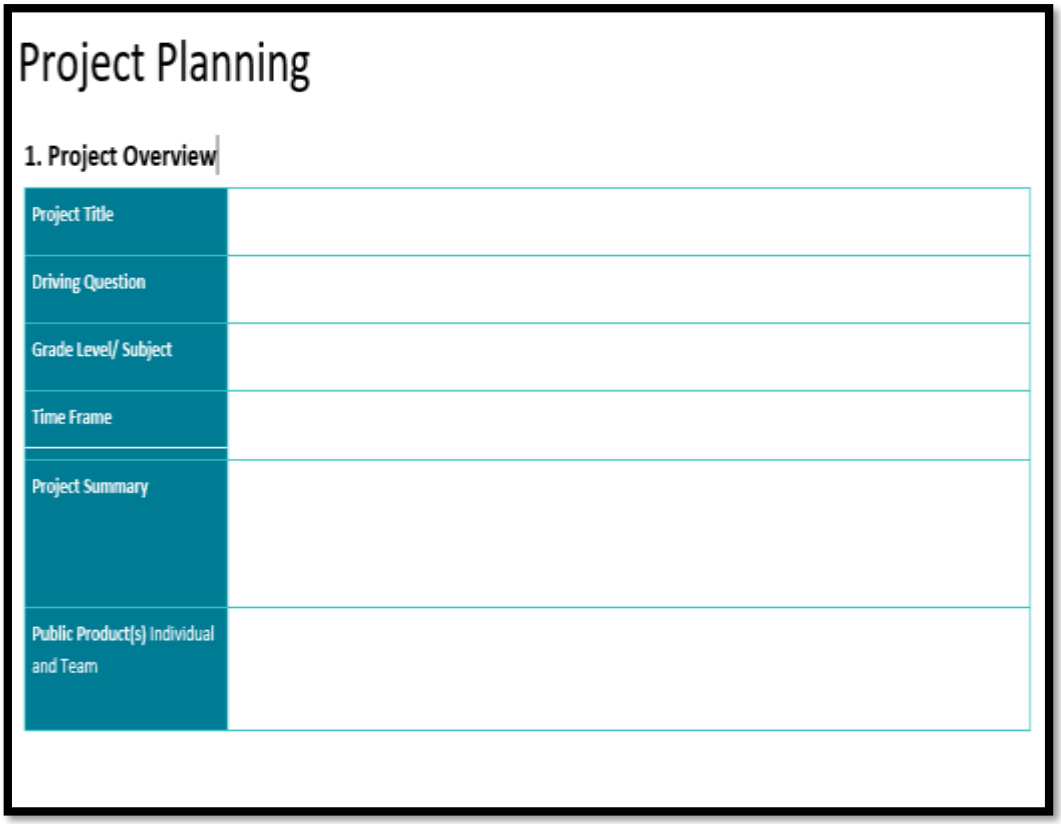
- Provide multiple opportunities for students to practice their presentations and receive feedback.
- Provide graphic organizers to help students organize their learning when observing one another's presentations.

- Help the students to identify the tone and level of formality most appropriate for the presentation audience and context. Provide models to help students understand the appropriate "register."
- Provide question frames to support audience members in asking questions.

Project-based learning plan

The learners can develop a project in two or more weeks. The instructor needs to plan the project to guide the process. The following guidelines seek to aid the instructors in creating a project unit plan. The Plan must start with the project overview. The instructor includes the general data: The project title, driving question, grade, level, subject, the time frame, and the products. The following examples shows a model of planning from the (Buck Institute for Education, 2019):

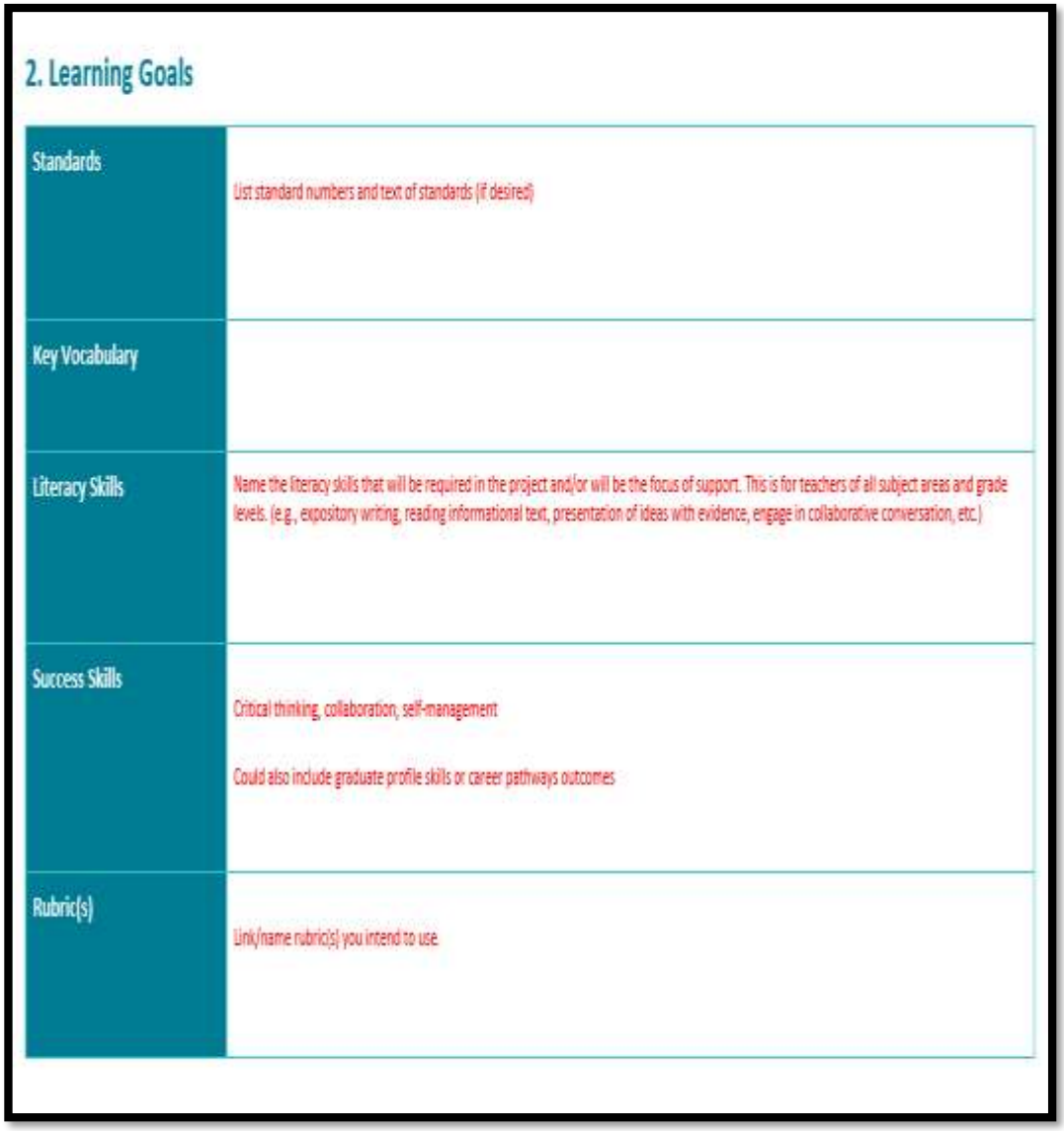
Figure 8. Project Overview



Source a Adapted from Buck Institute for Education, 2019 Self-made

Then the instructor must write a section with the Learning goals, which can include the curriculum standards, a list of the critical vocabulary, a list of the literacy skills for the development of the project, a list of success kills to develop, a list of rubrics or assessment tools.

Figure 9. Learning Goals



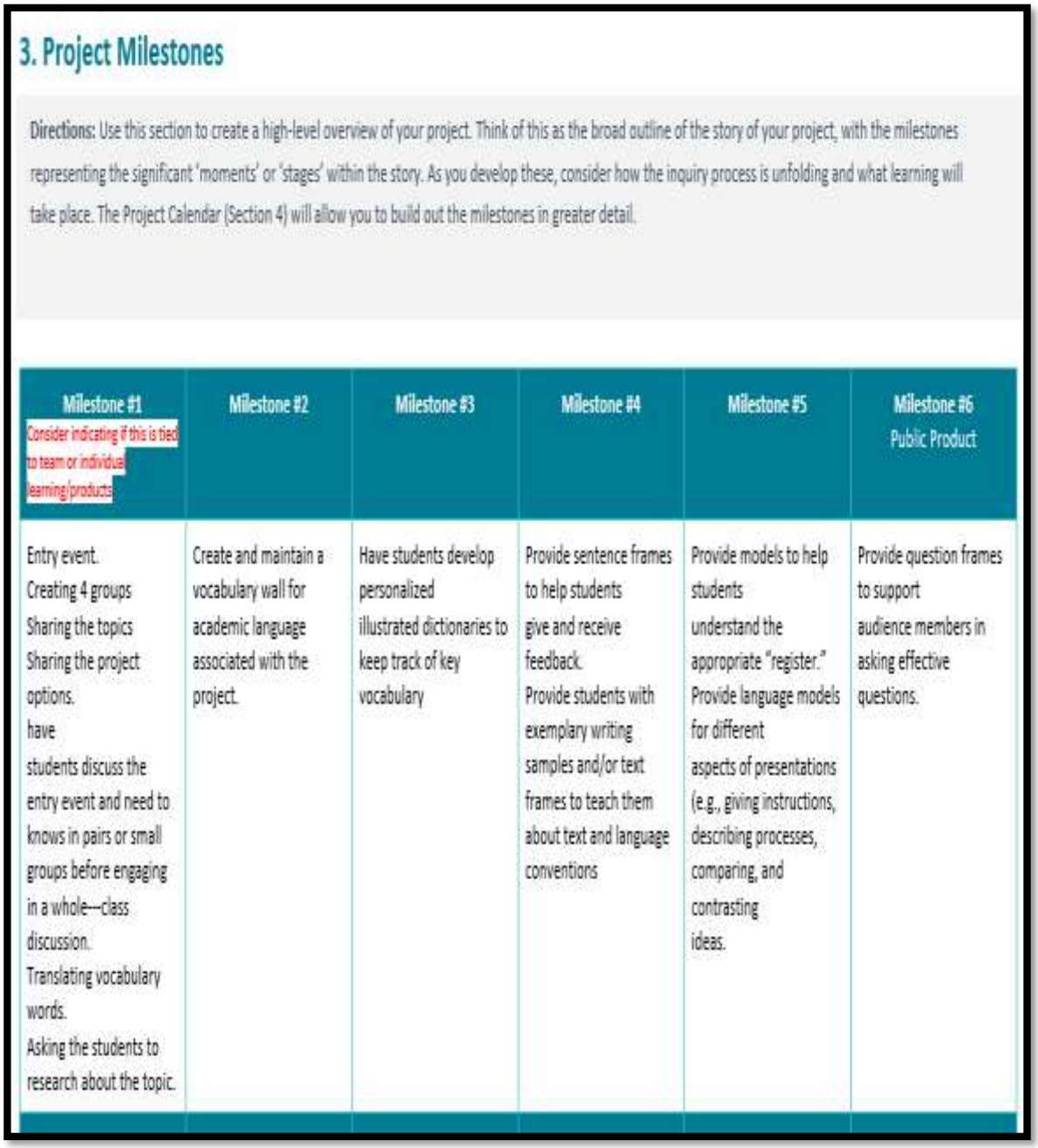
2. Learning Goals

Standards	List standard numbers and text of standards (if desired)
Key Vocabulary	
Literacy Skills	Name the literacy skills that will be required in the project and/or will be the focus of support. This is for teachers of all subject areas and grade levels. (e.g., expository writing, reading informational text, presentation of ideas with evidence, engage in collaborative conversation, etc.)
Success Skills	Critical thinking, collaboration, self-management Could also include graduate profile skills or career pathways outcomes
Rubric(s)	Link/name rubric(s) you intend to use

Source b Adapted from Buck Institute for Education, 2019 Self-made

Next, the instructor must specify the milestones for the project. In other words, the expected achievements for each session.

Figure 10. Project Milestones



3. Project Milestones

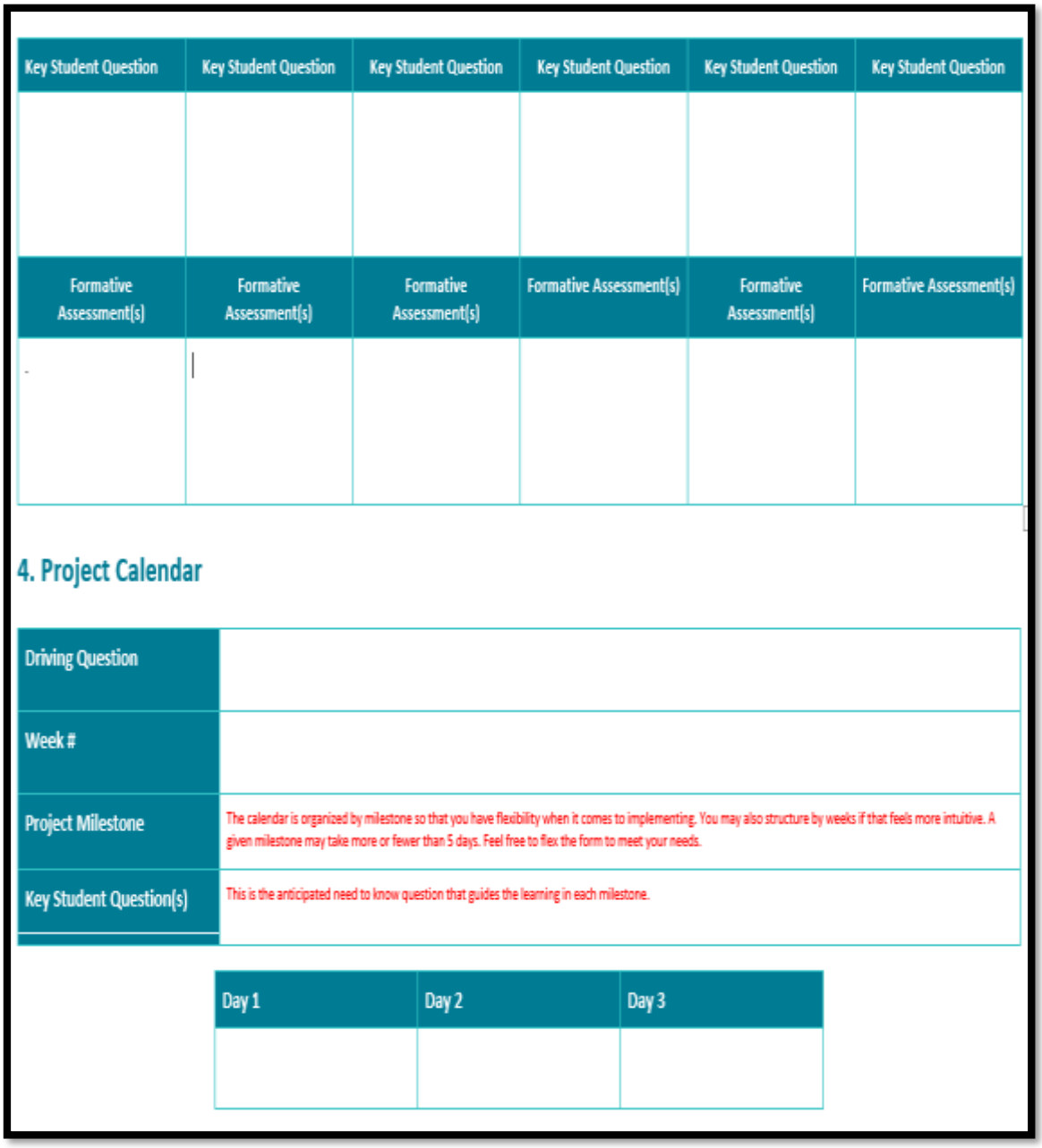
Directions: Use this section to create a high-level overview of your project. Think of this as the broad outline of the story of your project, with the milestones representing the significant 'moments' or 'stages' within the story. As you develop these, consider how the inquiry process is unfolding and what learning will take place. The Project Calendar (Section 4) will allow you to build out the milestones in greater detail.

Milestone #1 Consider indicating if this is tied to team or individual learning/products	Milestone #2	Milestone #3	Milestone #4	Milestone #5	Milestone #6 Public Product
Entry event. Creating 4 groups Sharing the topics Sharing the project options. have students discuss the entry event and need to knows in pairs or small groups before engaging in a whole—class discussion. Translating vocabulary words. Asking the students to research about the topic.	Create and maintain a vocabulary wall for academic language associated with the project.	Have students develop personalized illustrated dictionaries to keep track of key vocabulary	Provide sentence frames to help students give and receive feedback. Provide students with exemplary writing samples and/or text frames to teach them about text and language conventions	Provide models to help students understand the appropriate "register." Provide language models for different aspects of presentations (e.g., giving instructions, describing processes, comparing, and contrasting ideas.	Provide question frames to support audience members in asking effective questions.

Source c Adapted from Buck Institute for Education, 2019 Self-made

The instructor must create a section to specify the achievements of each milestone, the assessment, and define a flexible calendar according to the needs of the learners:

Figure 11. Assessment and Calendar



Key Student Question	Key Student Question	Key Student Question	Key Student Question	Key Student Question	Key Student Question
Formative Assessment(s)	Formative Assessment(s)	Formative Assessment(s)	Formative Assessment(s)	Formative Assessment(s)	Formative Assessment(s)

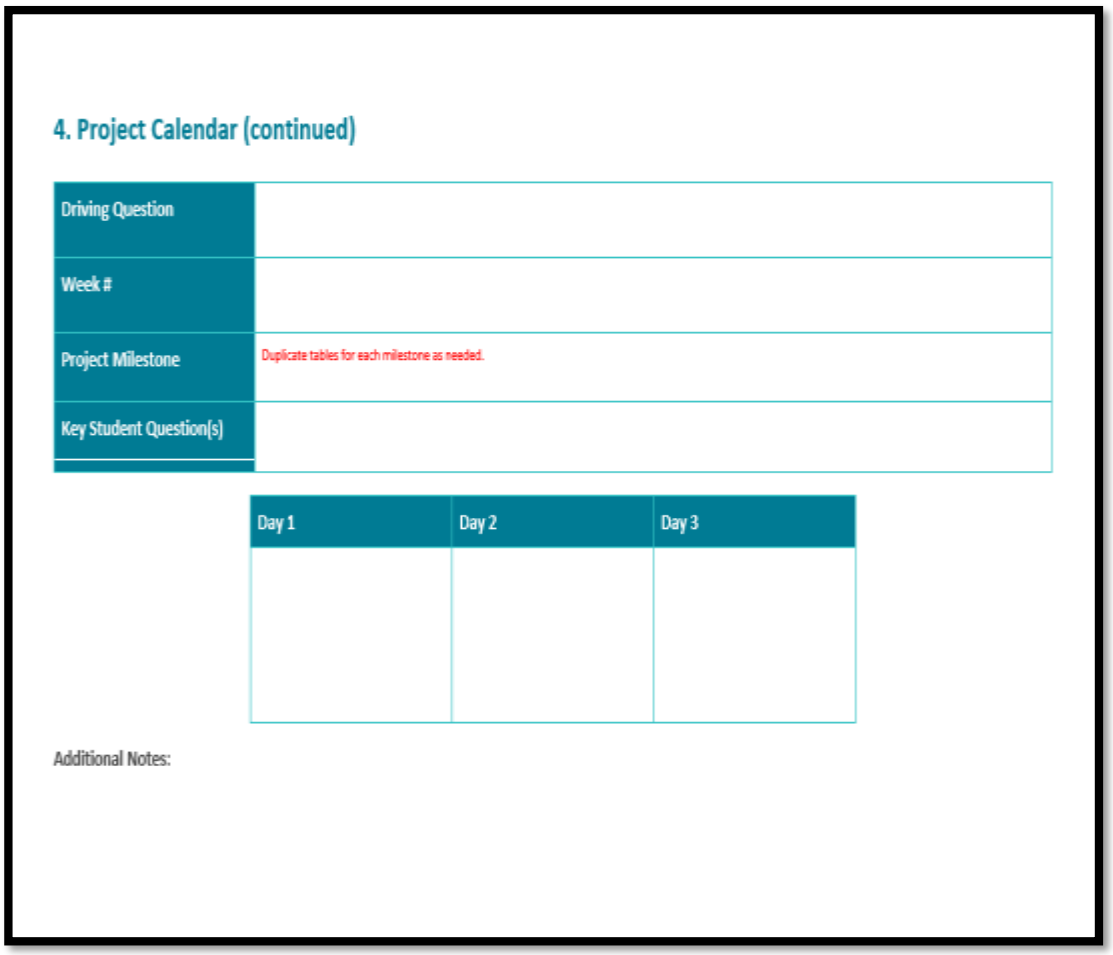
4. Project Calendar

Driving Question	
Week #	
Project Milestone	The calendar is organized by milestone so that you have flexibility when it comes to implementing. You may also structure by weeks if that feels more intuitive. A given milestone may take more or fewer than 5 days. Feel free to flex the form to meet your needs.
Key Student Question(s)	This is the anticipated need to know question that guides the learning in each milestone.

Day 1	Day 2	Day 3

Source d Adapted from Buck Institute for Education, 2019 Self-made

Figure 12. Project Calendar



4. Project Calendar (continued)

Driving Question	
Week #	
Project Milestone	Duplicate tables for each milestone as needed.
Key Student Question(s)	

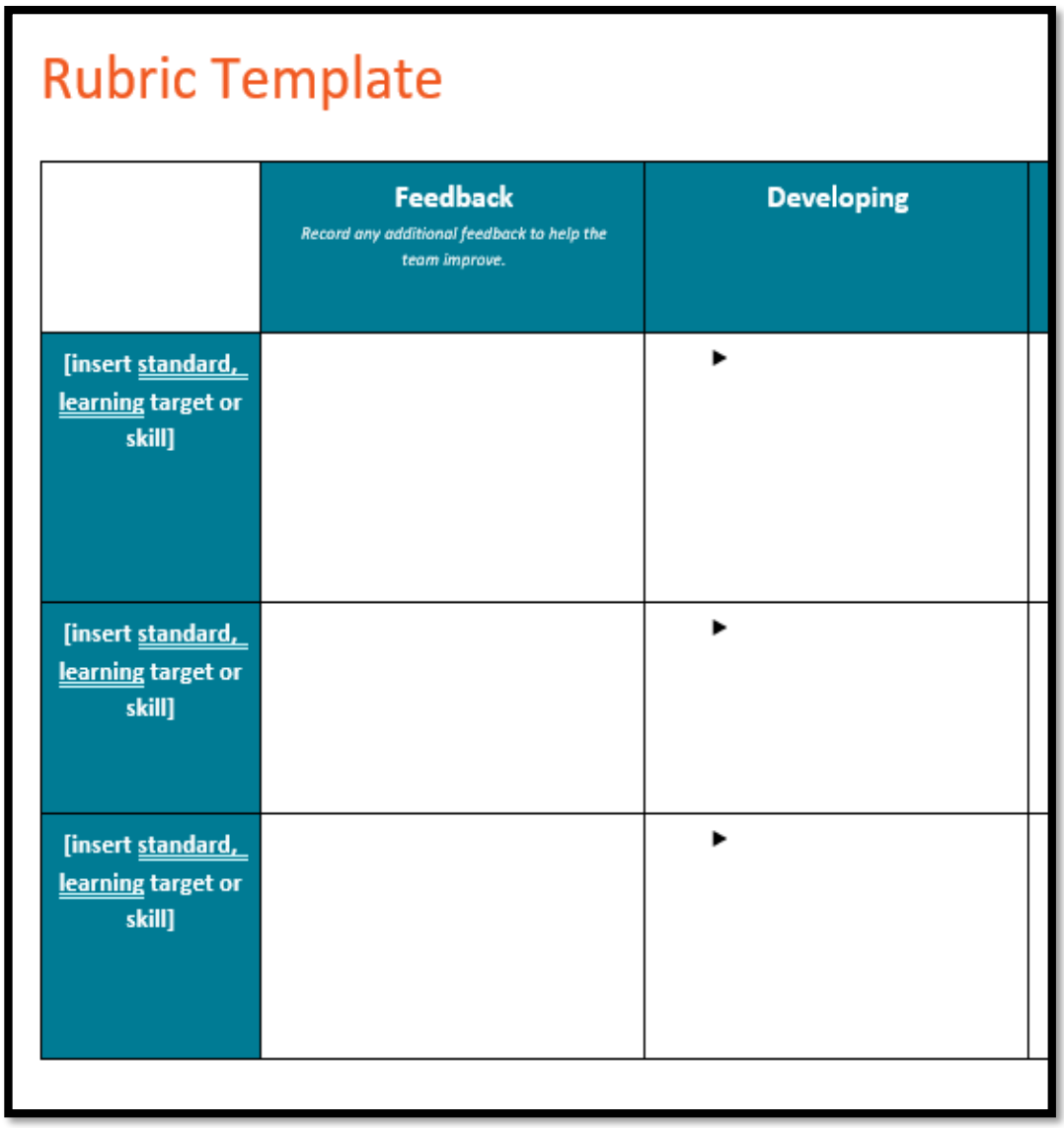
Day 1	Day 2	Day 3

Additional Notes:

Source e Adapted from Buck Institute for Education, 2019 Self-made

Finally, the following model of a rubric facilitates the assessment of the quality of the implementation of the projects:

Figure 13. Rubric Template Basic Project



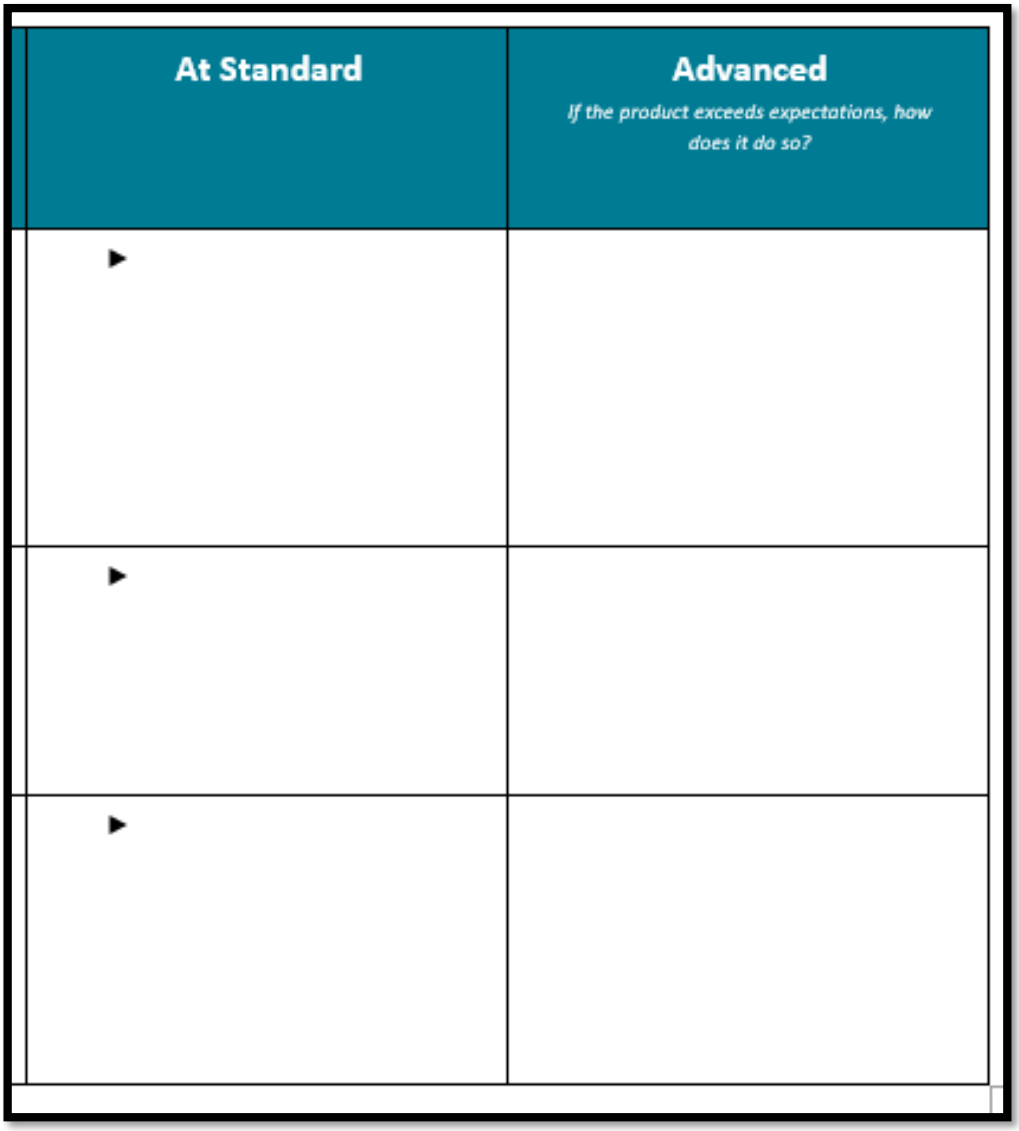
Rubric Template

	Feedback *Record any additional feedback to help the team improve.*	Developing	
[insert standard, learning target or skill]			
[insert standard, learning target or skill]			
[insert standard, learning target or skill]			

Source Adapted from Buck Institute for Education, 2019 Self-made

Two more columns can be added to create an assessment rubric for advanced projects.

Figure 14. Rubric Template for Advanced Projects



At Standard	Advanced *If the product exceeds expectations, how does it do so?*
▶	
▶	
▶	

Source Adapted from Buck Institute for Education, 2019 Self-made

Instructors can find additional guides and planning models on the Buck Institute for Education's official web page or other Gold Standard Project-Based Learning websites. However, a project will always require practice and experience to become a gold standard. This Quick guide intends to present the most important aspects before designing a project. Also, the focus of this guide is to help instructors focus their lessons on the improvement of vocabulary recall.

More complex projects and tools for planning might be required to promote other skills through the Project based Learning instruction methodology. To conclude, it is essential to mention that our learners can develop the skills that will allow them to be successful in the current times through implementing methodologies like Project-Based Learning Instruction. It depends on our teachers to take the first steps to guide the new generations and open our student's minds, equipping them with the tools to overcome the new challenges.

CHAPTER III. ANALYSIS OF THE RESULTS

Two groups of students from a local high school participated in a free English vocabulary course. The researcher randomly assigned the participants to experimental and control groups. The experimental group received a treatment using the Project-Based Learning method. The control group used the current traditional methodology to teach the same unit. The scores of a vocabulary test estimated their incidental vocabulary gains.

3.1. Descriptive statistics

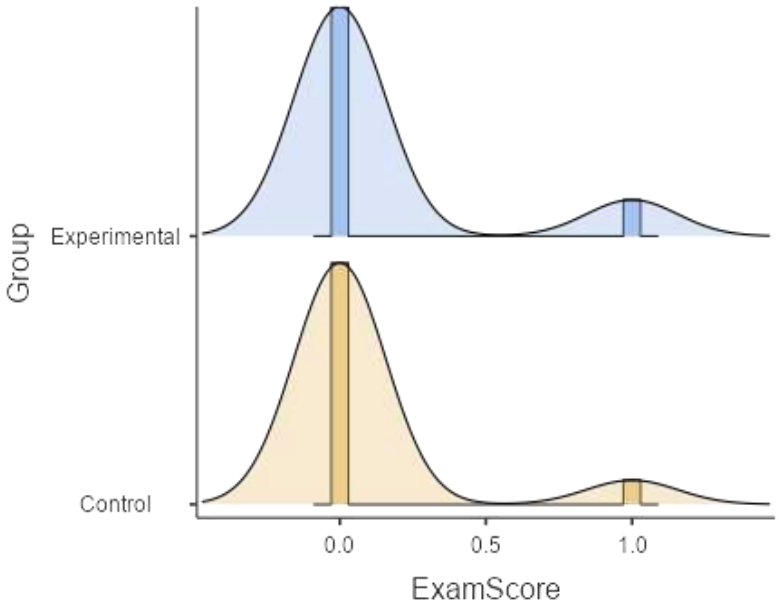
The researcher used a pre-test to verify the normal distribution of the two samples before applying the treatment since one of the main objectives was to determine the size effect of the Project-Based learning methodology on the experimental group. The following table summarizes the descriptive statistics of the pre-test results; additional graphics are included to present the information graphically:

Table 8.Descriptive Statistics from Jamovi

Descriptives		
	Group	ExamScore
N	Experimental	22
	Control	22
Missing	Experimental	0
	Control	0
Mean	Experimental	0.136
	Control	0.091
Standard deviation	Experimental	0.351
	Control	0.294
Minimum	Experimental	0
	Control	0
Maximum	Experimental	1
	Control	1
Skewness	Experimental	2.278
	Control	3.059
Std. error skewness	Experimental	0.491
	Control	0.491

Source: Self-made

Figure 15. Curve of data from Jamovi



Source: Self-made

Descriptive statistics analysis

The descriptive statistics presented above from table N.1 serve to assess the shape of the data. This way, the researcher ensured the correct assessment of the effects. Basic statistics presented include the mean (Experimental= 0.136, Control= 0.091), which is the mathematical average of the samples. Standard deviation (Experimental=0.351, Control=0.294) indicates the dispersion of the samples. Skewness (Experimental=2.278, Control=3.059) indicates if the curve of the data is symmetrical or not. The Plot represents this last statistic graphically.

3.2. Inferential statistics

The researcher used a t-test to compare the post-test results from the experimental and control groups after the treatment. The results from this test will be essential for achieving the study's objectives and testing the hypothesis formulated to conduct the study. The following table summarizes the results of the t-test:

Independent Samples T-Test

Table 9. T-test results to validate Ha from Jamovi

Independent Samples T-Test							
		Statistic		**df**	**p**		**Effect Size**
ExamScore	**Student's t**	3.865	[a]	42.00	< .001	Cohen's d	1.165
Note. H_a Experimental > Control							

Source: Self-made

Hypothesis testing

Ha = The Project-based learning method improves the abilities of the students to recall vocabulary words.

Ho = The Project-based learning method does not improve the abilities of the students to recall vocabulary words.

The analysis reveals superior gains for the experimental group (***t (22) = 3.865, p<.001), (Cohen's d effect size of 1.165).*** Indicating that the effects of Project-based learning improved the vocabulary recall abilities of the experimental group. Data presented in table N.1 allows the researcher to support the Ha Hypothesis, which says that “The Project-based learning method improves the students' abilities to recall vocabulary words”.

3.3. Results

The researcher estimated the different effects of each methodology on the students' abilities to recall new vocabulary words. The participants from the experimental group were found to improve their abilities to recall new vocabulary words (M= 1.409, SD= 1.333) more than the control group (M= 0.182, SD=0.664) ***t (22) = 3.865, p<.001***, Mdiff = 1.227, 95% CI [0.586, 1.868]. With a Cohen's d effect size of 1.165, this effect was large.

A brief discussion of these results can provide even more insights into the undisputable effect of the Project-Based learning method. Both groups achieved limited progress due to the amount of time to develop the methodologies and other difficulties discussed throughout the research chapters. However, the experimental group shows better results in the post-tests. The ***t*** value presented above indicates that, indeed, the Project-based learning method improves the abilities of the students to recall vocabulary words with only a 1 in a thousand chance of mistake. Cohen's d effect size corroborates that the effects of Project-based learning improved the

vocabulary recall abilities of the experimental group. Both statistics are high, reducing the probability of error to the minimum. Therefore, allowing the researcher to reject the null hypothesis and present valid results.

CONCLUSIONS

- This research study has proposed a hypothesis that argues that the Project-Based Learning method improves the abilities of the students to recall vocabulary words. The literature revealed that the inability to recall vocabulary words negatively affects the learner's speaking fluency. Nonetheless, current learners can use modern methodologies to improve their abilities. This improvement of the recall abilities results from combining the features of any modern learner-centered approach with the scaffolding process of Project-based Learning instruction. The researcher expects to have presented convincing arguments about using the features present in the Gold Standard Project-Based Learning method to improve vocabulary recall abilities.

- Based on quantitative analysis of pre-tests and post-test scores, it can be concluded that Project-based learning features related to vocabulary teaching effectively increase the learners' abilities regarding vocabulary recall. This study offered a reliable method to test these assumptions even when some data appeared challenging to analyze. The present study also contributes to generating more empirical data about the effects of the Project-Based learning method on vocabulary recall.

- The findings can help to improve the current teaching methods in our country. Some findings also challenge the belief that vocabulary definitions or translation must be avoided at all costs. Finally, the findings confirmed at 99% confidence that scaffolded, collaborative, self-directed learning, present in the Project-Based Learning method, increases the vocabulary recall ability of the English as a Foreign Language (EFL) learners.

RECOMMENDATIONS

- This research study clearly illustrates that the project-based learning method significantly affects vocabulary learning. However, the final score results raise two critical questions. First, the expected gains by the students did not match the final achievements regardless of the method, and several factors might be causing this phenomenon.

- Other lines of research might be interested in finding out what other factors interfere with vocabulary learning. As for now, it is noticeable that our learners require time to cover the contents of a study unit and achieve its learning goals. Therefore, based on the findings of this study, practitioners need to consider the possibility of modifying the time frames of some study units. Moreover, since vocabulary is crucial in achieving fluency, teaching the meanings of key vocabulary words of a study unit in advance is recommended.

- Second, the present study did not measure the gains from an extended exposure period due to time limitations. Time is required to add more units and determine the effects on retaining previously acquired vocabulary words. Also, the Project-Based Learning method produces better effects with more crafted projects that require time and might not fit within the politics of current educational institutions, making it difficult to conduct long-term studies to test its benefits. A long-term study can measure the benefits of the Project-Based Learning method applied during a long period and measure the retention rate of vocabulary words.

BIBLIOGRAPHY

Alsamani, A.-A. S., & Daif-Allah, A. S. (2015). *Introducing Project-based Instruction in the Saudi ESP Classroom: A Study in Qassim University*. English Language Teaching, 9(1), 51. https://doi.org/10.5539/elt.v9n1p51

Baş, G., & Beyhan, Ö. (2010). *Effects of multiple intelligences supported project-based learning on students' achievement levels and attitudes towards english lesson*. International Electronic Journal of Elementary Education, 2(3), 365–385.

Buck Institute for Education. (2017). *English learner scaffolds for PBL*. 7–9. www.bie.org

Campbell, A. S. (2012). *The phenomenological study of ESL students in a project-based learning environment*. Int J Interdiscip Soc Sci. 139–152.

Condliffe, B., Quint, J., Visher, M. G., Bangser, M. R., Drohojowska, S., Saco, L., & Nelson, E. (2017). *Project-Based Learning A Literature Review Working Paper* Prepublication copy: Release. October, 84.

deHaan, J., Michael Reed, W. M., & Kuwada, K. (2010). *The effect of interactivity with a music video game on second language vocabulary recall*. Language Learning and Technology, 14(2), 74–94.

Dooly, M., & Sadler, R. (2016). *Becoming little scientists: Technologically-enhanced project-based language learning. Language Learning and Technology*, 20(1), 54–78.

Echeverria, S. E. F. (2000). *Implementation of a Project Based Learning Approach for the Sénior Year and Fourth Course of Secondary from Henri Becquerel Experimental High Schoo*l. Pontificia Universidad Catolica del Ecuador Sede Ambato, 2020.

Filippatou, D., & Kaldi, S. (2010). *The effectiveness of project based learning on pupils with learning difficulties regarding academic performance, group work and motivation*. International Journal of Special Education, 25(1), 17–26.

Gai Mali, Y. C. (2016). *Project-Based Learning in Indonesian EFL Classrooms: from Theory to Practice. IJEE (Indonesian Journal of English Education)*, 3(1), 89–105. https://doi.org/10.15408/ijee.v3i1.2651

Gulbahar Beckett, A. H. (2012). *CincySTEM Urban Initiative: Project-based Science Learning with Digital Backpack. Teaching English with Technology*, 37–52.

Herrera, S. G., Holmes, M. A., & Kavimandan, S. K. (2012). *Bringing theory to Life: Strategies that make culturally responsive pedagogy a reality in diverse secondary classrooms.* International Journal of Multicultural Education, 14(3), 1–19. https://doi.org/10.18251/ijme.v14i3.608

Kalabzová, M. (2015). *The Application Of Project Based Learning In The English Classrooms*. (Doctoral Dissetation, The University of West Bohemia Faculty of Education Department of English Thesis).

Kimsesiz, F., Dolgunzos, E., & Konca, M. Y. (2017). *International Journal of Languages ' Education and Teaching statistical and inferential analyses on the non-english. International* Journal of Languages' Education and Teaching, 5(4), 426–439. http://files.eric.ed.gov/fulltext/ED581572.pdf

King, M. O. (2011). *Effects of Teaching Vocabulary Using Various Forms of Rich Instruction in Thematically Versus Randomly Grouped Sets* by Michael O . King A dissertation submitted to the Graduate Faculty of Auburn University in partial fulfillment of the requirements for th. 75.

Klimova, B., & Kacet, J. (2017). *Efficacy of computer games on language learning.* Turkish Online Journal of Educational Technology, 16(4), 19–26.

Lam, N. T. Van. (2011). *Project-based learning in teaching English as a foreign*

language. VNU Journal of Science, 27, 140–146. http://repository.vnu.edu.vn/bitstream/VNU_123/58517/1/27.2.8.pdf

Mahasneh, A. M., & Alwan, A. F. (2018). The effect of project-based learning on student teacher self-efficacy and achievement. International Journal of Instruction, 11(3), 511–524. https://doi.org/10.12973/iji.2018.11335a

Martí, José; Heydrich, Mayra; Rojas, Marcia; Hernández, A. (2010). *Aprendizaje basado en proyectos: una experiencia de innovación docente*. Universidad de Alicante, 46, 11–21.

McCarthy, T. (2010). *Integrating project-based learning into a traditional skills-based curriculum to foster learner autonomy: An action research*. The Journal of Kanda University of International Studies, 22, 221–244.

Medina Nicolalde, M., & Tapia Calvopiña, M. (2017). *El aprendizaje basado en proyectos una oportunidad para trabajar interdisciplinariamente.* Olimpia: Publicación Científica de La Facultad de Cultura Física de La Universidad de Granma, 14(46), 236–246.

Musa, F., Mufti, N., Latiff, R. A., & Amin, M. M. (2012). *Project-based Learning (PjBL): Inculcating Soft Skills in 21st Century Workplace*. Procedia - Social and Behavioral Sciences, 59(2006), 565–573. https:/ /doi.or g/10. /j.sbsp ro.201

2.09.3 15

Nation, I., & Hunston, S. (2013). *Learning Vocabulary in Another Language*. I.S.P. Nation (2nd ed., C). Cambridge: Cambridge University Press. http s://d oi.or g/10 .1093/elt/56.1.91

Rahman, S., Yasin, R. M., & Mohd Yassin, S. F. (2011). *The implementation of project-based approach at preschool education program*. Procedia - Social and Behavioral Sciences, 18, 476–480. https://doi.o rg/10.1016/ j.sbspro.20 11.05.070

Roessingh, H., & Chambers, W. (2011). *Project-Based Learning and Pedagogy in Teacher Preparation: Staking Out the Theoretical Mid-Ground.* International Journal of Teaching and Learning in Higher Education, 23(1), 60–71. http://www.isetl.org/ijtlhe/

Shafaei, A., & Rahim, H. A. (2015). *Does project-based learning enhance Iranian EFL learners' vocabulary recall and retention?* Iranian Journal of Language Teaching Research, 3(2), 83–100.

Slater, T., & Beckett, G. (2019). *Integrating language, content, technology, and skills development through project-based language learning*: *Blending frameworks for successful unit planning*. Mextesol Journal, 43(1), 1–14.

Takeda, I. (2016). Report: *Project-based learning with 21st century skills for the Japanese language classroom*. Journal of Integrated Creative Studies, 1–7. http://www2.yukawa.kyoto-u.ac.jp/~future/wp-content/uploads/2017/12/2016-020 f

Toaquiza, M. R. (2018). *El cuento corto en el aprendizaje de vocabulario del idioma ingles en los estudiantes de octavo año de la Unidad Educativa Fiscal Mixta "Gran Bretaña" de la ciudad de Quito año lectivo 2017-2018*. Figura 1, 2–3.

Webb, S. (2007). *The effects of repetition on vocabulary knowledge*. Applied Linguistics, *28*(1), 46–65. https://doi.org/10.1093/applin/aml048

APPENDIXES

Appendix 1. Pre-tests and Post-tests (Samples)

TEST DE MEDICION DE LA HABILIDAD PARA RECORDAR PALABRAS EN INGLES

Indicaciones:

Asegúrese que el número de caracteres de la palabra que desea escribir es correcto y escriba únicamente una letra en cada casillero.

Ejemplo de respuesta no valida:

~~UP~~	M	O	S	T

Responda únicamente usando mayúscula imprenta. El siguiente cuadro incluye todos los caracteres aceptados para esta prueba:

A	B	C	D
E	F	G	H
I	J	K	L
M	N	O	P
Q	R	S	T
U	V	W	X
Y	Z		

Ejemplo de respuesta no valida:

4	m	O	s	T

Escriba cada ítem solamente una vez y continúe con el siguiente hasta finalizar la prueba, incluso si contiene alguno de los errores mencionados, no debe efectuar revisiones o correcciones en ninguno de los ítems incorrectos.

Traduzca los siguientes ítems al inglés:

1 Sonrisa

2 Estado de animo

3 Pequeño

4 Más allá de

5 Hacer/Fabricar

6 Salud

7 Cerebro

8 Poliglota

9 Asunto

10 Cuerpo

11 Mente

12 Habito

13 Ayuda

14 Beneficio

15 Disminuir

16 Incrementar

17 Dolor

18 Mejorar

19	Etapa	
20	Aumentar	
21	Mundo	
22	Onda	
23	Profundo	
24	Conciencia	
25	Debajo	
26	Propio/de uno mismo	
27	Deseo	
28	Enfermedad	
29	Movimiento	
30	Energía	

RECALL PRE-TEST

Indicaciones:

Asegúrese que el número de caracteres de la palabra que desea escribir es correcto y escriba únicamente una letra en cada casillero.

~~UP~~	M	O	S	T

Ejemplo de respuesta no valida:

Responda únicamente usando mayúscula imprenta. El siguiente cuadro incluye todos los caracteres aceptados para esta prueba:

A	B	C	D
E	F	G	H
I	J	K	L
M	N	O	P
Q	R	S	T
U	V	W	X
Y	Z		

Ejemplo de respuesta no | 4 | m | O | s | T | **valida:**

Escriba cada ítem solamente una vez y continúe con el siguiente hasta finalizar la prueba, incluso si contiene alguno de los errores mencionados, no debe efectuar revisiones o correcciones en ninguno de los ítems incorrectos.

Traduzca los siguientes ítems al inglés:

1 Seguridad

2 Lengua

3 Idioma

4 Relacionado

5 Carta

6 Reina

7 Cerebro

8 Pais

9 Algunos/as

10 Todos/as

11 Caracteristicas

12 Divertido/a

13 Cocinero/a

14 Mascota

15 Delgado/a

16 Tranquilo/a

17 Sonrisa

18 Enfermero/a

19 Etapa

20 Vida

21 Asombroso/a

22 Crecer

23 Profundo

24 Dentro

25	Fuera	
26	Despues	
27	Pensar	
28	Enfermedad	
29	Solitario	
30	Salud	

Post-tests: Main Study (Sample)

RECALL POST-TEST

Indicaciones:

Asegúrese que el número de caracteres de la palabra que desea escribir es correcto y escriba únicamente una letra en cada casillero.

Ejemplo de respuesta no valida:

~~UP~~	M	O	S	T

Responda únicamente usando mayúscula imprenta. El siguiente cuadro incluye todos los caracteres aceptados para esta prueba:

A	B	C	D
E	F	G	H
I	J	K	L
M	N	O	P
Q	R	S	T
U	V	W	X
Y	Z		

Ejemplo de respuesta no | 4 | m | O | s | T | **valida:**

Escriba cada ítem solamente una vez y continúe con el siguiente hasta finalizar la prueba, incluso si contiene alguno de los errores mencionados, no debe efectuar revisiones o correcciones en ninguno de los ítems incorrectos.

Traduzca las siguientes palabras al inglés:

1 Seguridad | | | | | | |

2 Lengua | | | | | | |

3 Idioma | | | | | | | | |

Appendix 2. Pre and Post-tests with answers (Samples)

RECALL PRE-TEST

Indicaciones:

Asegúrese que el número de caracteres de la palabra que desea escribir es correcto y escriba únicamente una letra en cada casillero.

Ejemplo de respuesta no valida: | ~~UP~~ | M | O | S | T |

Responda únicamente usando mayúscula imprenta. El siguiente cuadro incluye todos los caracteres aceptados para esta prueba:

A	B	C	D
E	F	G	H
I	J	K	L
M	N	O	P
Q	R	S	T
U	V	W	X
Y	Z		

Ejemplo de respuesta no valida: | 4 | m | O | s | T |

Escriba cada ítem solamente una vez y continúe con el siguiente hasta finalizar la prueba, incluso si contiene alguno de los errores mencionados, no debe efectuar revisiones o correcciones en ninguno de los ítems incorrectos.

Traduzca los siguientes ítems al inglés:

1 Seguridad | S | e | g | u | | |

2 Lengua | L | e | n | g | u | a | j | e

3 Idioma | L | e | n | g | u | a | j | e

4 Relacionado | | | | | | | |

5 Carta | | | | | | |

6 Reina | Q | u | e | e | n |

7 Cerebro | | | | | |

8 Pais | C | o | u | n | t | r | y |

9 Algunos/as | | | | |

10 Todos/as | | | |

11 Caracteristicas

12 Divertido/a

13 Cocinero/a

14 Mascota dog

15 Delgado/a

16 Tranquilo/a Relax

17 Sonrisa

18 Enfermero/a Nurse

19 Etapa

20 Vida

21 Asombroso/a

22 Crecer

23 Profundo

24 Dentro

25 Fuera

26 Despues

27 Pensar

28 Enfermedad

29 Solitario

30 Salud

RECALL PRE-TEST

Indicaciones:

Asegúrese que el número de caracteres de la palabra que desea escribir es correcto y escriba únicamente una letra en cada casillero.

Ejemplo de respuesta no valida: | ~~UP~~ | M | O | S | T |

Responda únicamente usando mayúscula imprenta. El siguiente cuadro incluye todos los caracteres aceptados para esta prueba:

A	B	C	D
E	F	G	H
I	J	K	L
M	N	O	P
Q	R	S	T
U	V	W	X
Y	Z		

Ejemplo de respuesta no valida: | 4 | ∞ | O | s | T |

Escriba cada ítem solamente una vez y continúe con el siguiente hasta finalizar la prueba, incluso si contiene alguno de los errores mencionados, no debe efectuar revisiones o correcciones en ninguno de los ítems incorrectos.

Traduzca los siguientes ítems al inglés:

1 Seguridad | S | e | g | u | r | i |

2 Lengua | | | | | | |

3 Idioma | | | | | | | |

4 Relacionado | | | | | | | |

5 Carta | | | | | | |

6 Reina | Q | u | i | n | g |

7 Cerebro | | | | | |

8 Pais | | | | | | |

9 Algunos/as | + | h | e | y |

10 Todos/as | A | l | l |

11 Caracteristicas

12 Divertido/a

13 Cocinero/a

14 Mascota

15 Delgado/a

16 Tranquilo/a

17 Sonrisa

18 Enfermero/a Nurse

19 Etapa

20 Vida

21 Asombroso/a

22 Crecer

23 Profundo

24 Dentro

25 Fuera

26 Despues

27 Pensar

28 Enfermedad

29 Solitario

30 Salud

RECALL POST-TEST

Indicaciones:

Asegúrese que el número de caracteres de la palabra que desea escribir es correcto y escriba únicamente una letra en cada casillero.

Ejemplo de respuesta no valida: | ~~UP~~ | M | O | S | T |

Responda únicamente usando mayúscula imprenta. El siguiente cuadro incluye todos los caracteres aceptados para esta prueba:

A	B	C	D
E	F	G	H
I	J	K	L
M	N	O	P
Q	R	S	T
U	V	W	X
Y	Z		

Ejemplo de respuesta no valida: | 4 | ∞ | O | s | T |

Escriba cada ítem solamente una vez y continúe con el siguiente hasta finalizar la prueba, incluso si contiene alguno de los errores mencionados, no debe efectuar revisiones o correcciones en ninguno de los ítems incorrectos.

Traduzca las siguientes palabras al inglés:

1 Seguridad | s | e | c | u | r | i | t | y |

2 Lengua | l | e | n | g | u | a | g | e |

3 Idioma | L | a | n | g | u | a | g | e |

4 Relacionado | R | e | l | a | t | e | d |

5 Carta | l | e | t | t | e | r | . |

RECALL POST-TEST

Indicaciones:

Asegúrese que el número de caracteres de la palabra que desea escribir es correcto y escriba únicamente una letra en cada casillero.

Ejemplo de respuesta no valida: | ~~UP~~ | M | O | S | T |

Responda únicamente usando mayúscula imprenta. El siguiente cuadro incluye todos los caracteres aceptados para esta prueba:

A	B	C	D
E	F	G	H
I	J	K	L
M	N	O	P
Q	R	S	T
U	V	W	X
Y	Z		

Ejemplo de respuesta no valida: | 4 | - | O | s | T |

Escriba cada ítem solamente una vez y continúe con el siguiente hasta finalizar la prueba, incluso si contiene alguno de los errores mencionados, no debe efectuar revisiones o correcciones en ninguno de los ítems incorrectos.

Traduzca las siguientes palabras al inglés:

1 Seguridad | Security |

2 Lengua | Tongue |

3 Idioma | Idioms |

4 Relacionado | Related |

5 Carta | Letter |

RECALL POST-TEST

Indicaciones:

Asegúrese que el número de caracteres de la palabra que desea escribir es correcto y escriba únicamente una letra en cada casillero.

Ejemplo de respuesta no valida: | ~~UP~~ | M | O | S | T |

Responda únicamente usando mayúscula imprenta. El siguiente cuadro incluye todos los caracteres aceptados para esta prueba:

A	B	C	D
E	F	G	H
I	J	K	L
M	N	O	P
Q	R	S	T
U	V	W	X
Y	Z		

Ejemplo de respuesta no valida: | 4 | m | O | s | T |

Escriba cada ítem solamente una vez y continúe con el siguiente hasta finalizar la prueba, incluso si contiene alguno de los errores mencionados, no debe efectuar revisiones o correcciones en ninguno de los ítems incorrectos.

Traduzca las siguientes palabras al inglés:

1 Seguridad | S | e | c | u | r | i | t | y |

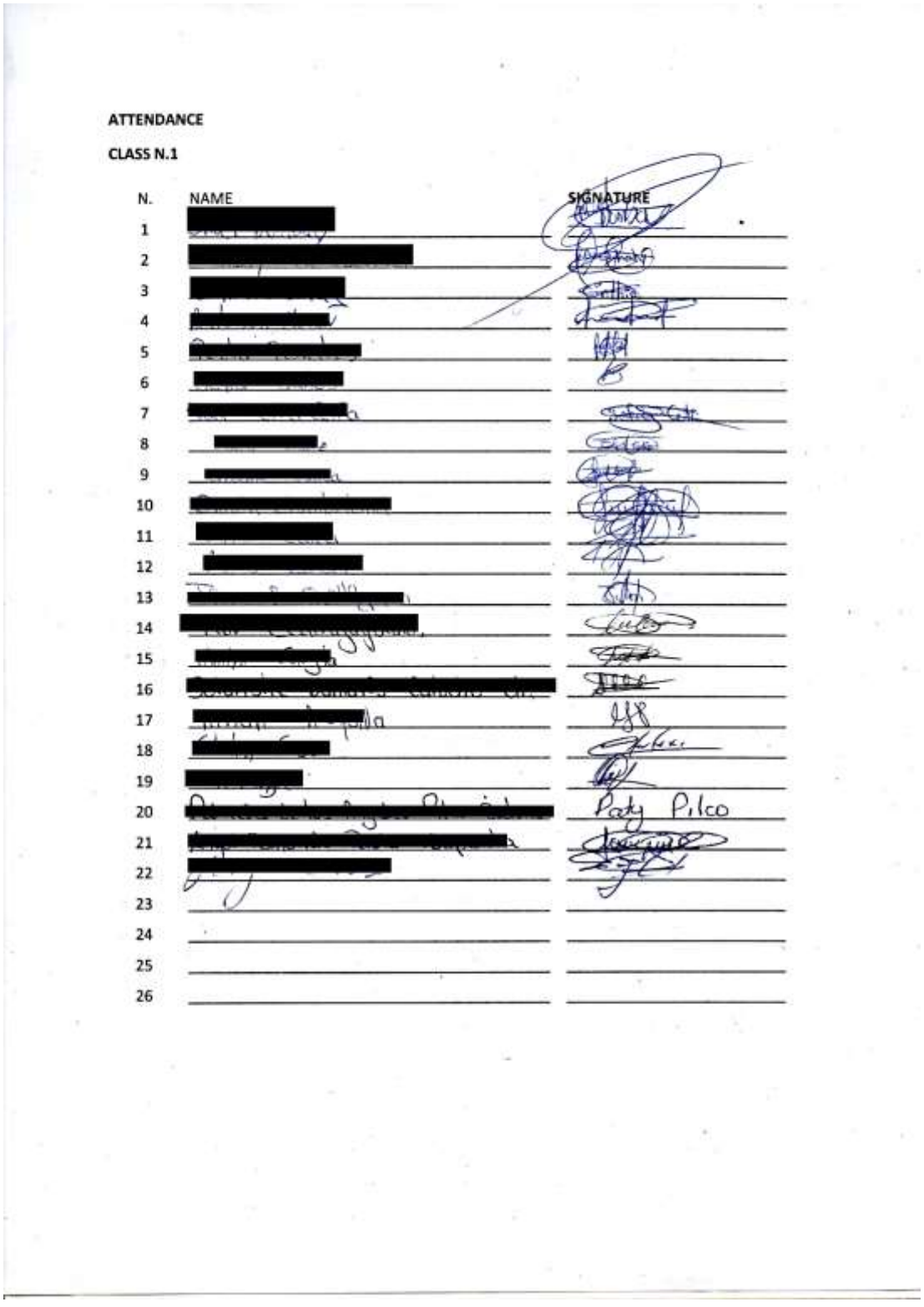
2 Lengua | T | o | n | G | U | E |

3 Idioma | I | d | i | o | m | s | | |

4 Relacionado | R | e | l | a | t | e | d |

5 Carta | l | e | t | t | e | r |

Appendix 3. Attendance Signatures (Sample)



ATTENDANCE

CLASS N.1

N.	NAME	SIGNATURE
1	[redacted]	
2	[redacted]	
3	[redacted]	
4	[redacted]	
5	[redacted]	
6	[redacted]	
7	[redacted]	
8	[redacted]	
9	[redacted]	
10	[redacted]	
11	[redacted]	
12	[redacted]	
13	[redacted]	
14	[redacted]	
15	[redacted]	
16	[redacted]	
17	[redacted]	
18	[redacted]	
19	[redacted]	
20	[redacted]	Paty Pilco
21	[redacted]	
22	[redacted]	
23		
24		
25		
26		

Appendix 4. Headmaster's permission to conduct the main study

San Lorenzo, 26 de abril de 2022

Magister.

Byron Guashpa

Rector (E) de la "Unidad Educativa San Lorenzo"

Presente.

Reciba un cordial y respetuoso saludo a la vez que le deseo éxitos en sus funciones.

Yo, Fausto David Ortega Yanez con C.I. N. 0603960840, a través de la presente me permito solicitar usted de la manera más comedida autorizar la ejecución del estudio de campo para la investigación denominada: "A quantitative analysis of the effects of Project-based Learning on vocabulary recall" en el plantel que tan acertadamente dirige, la cuál consiste en impartir un curso gratuito de Ingles a un grupo de estudiantes voluntarios luego de la jornada de clases.

Sin otro particular por el momento, me despido, esperando su atención y quedando a sus órdenes.

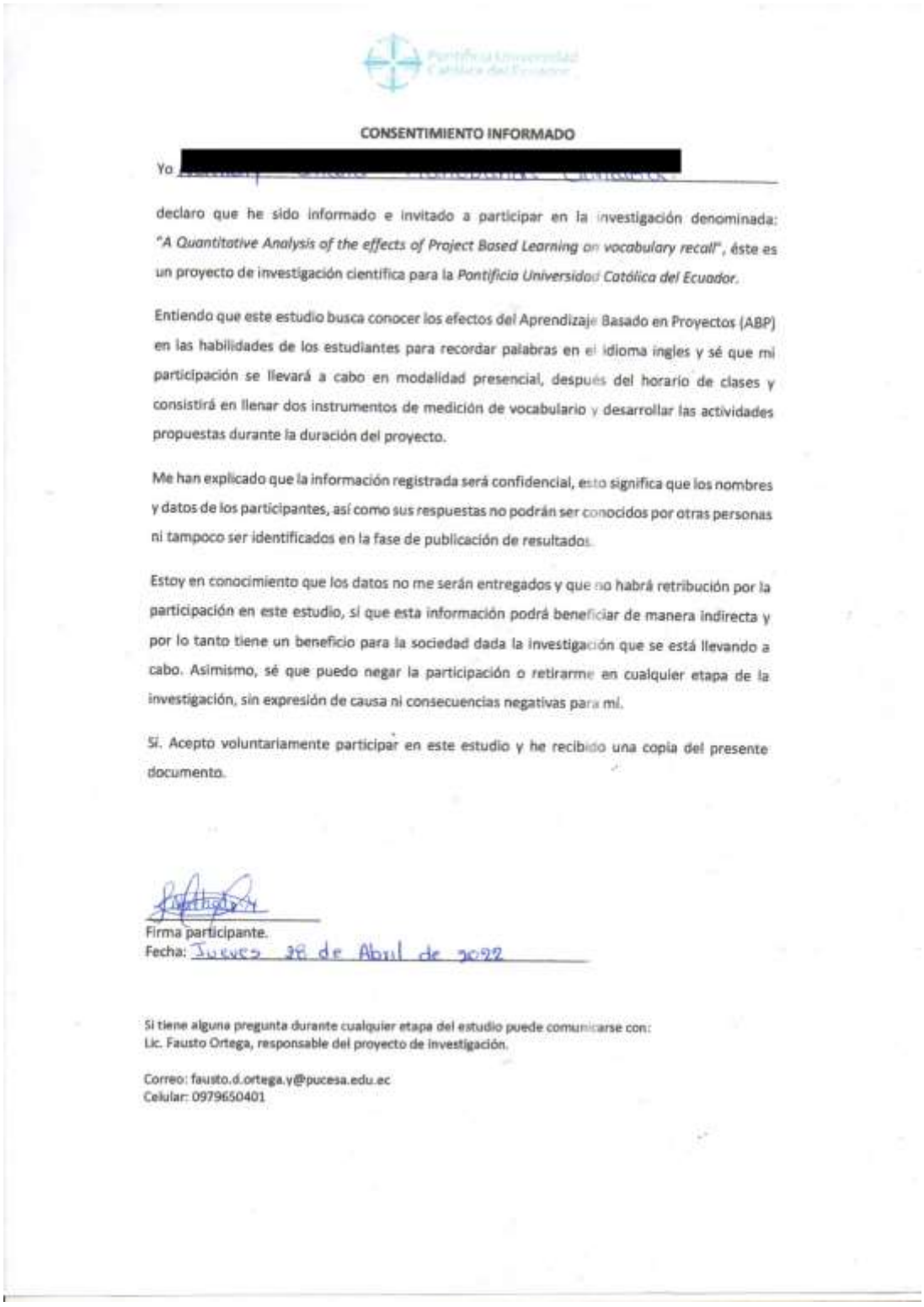
Atentamente

LIC. FAUSTO ORTEGA
DOCENTE

Unidad Educativa "San Lorenzo" RECTORADO San Lorenzo - Prov. Esmeraldas

Recibido 26/4/2022

Appendix 4. Informed Consents (Samples)



CONSENTIMIENTO INFORMADO

Yo [redacted]

declaro que he sido informado e invitado a participar en la investigación denominada: *"A Quantitative Analysis of the effects of Project Based Learning on vocabulary recall"*, éste es un proyecto de investigación científica para la *Pontificia Universidad Católica del Ecuador*.

Entiendo que este estudio busca conocer los efectos del Aprendizaje Basado en Proyectos (ABP) en las habilidades de los estudiantes para recordar palabras en el idioma inglés y sé que mi participación se llevará a cabo en modalidad presencial, después del horario de clases y consistirá en llenar dos instrumentos de medición de vocabulario y desarrollar las actividades propuestas durante la duración del proyecto.

Me han explicado que la información registrada será confidencial, esto significa que los nombres y datos de los participantes, así como sus respuestas no podrán ser conocidos por otras personas ni tampoco ser identificados en la fase de publicación de resultados.

Estoy en conocimiento que los datos no me serán entregados y que no habrá retribución por la participación en este estudio, sí que esta información podrá beneficiar de manera indirecta y por lo tanto tiene un beneficio para la sociedad dada la investigación que se está llevando a cabo. Asimismo, sé que puedo negar la participación o retirarme en cualquier etapa de la investigación, sin expresión de causa ni consecuencias negativas para mí.

Sí. Acepto voluntariamente participar en este estudio y he recibido una copia del presente documento.

Firma participante.
Fecha: Jueves 28 de Abril de 2022

Si tiene alguna pregunta durante cualquier etapa del estudio puede comunicarse con:
Lic. Fausto Ortega, responsable del proyecto de investigación.

Correo: fausto.d.ortega.y@pucesa.edu.ec
Celular: 0979650401

Pontificia Universidad Católica del Ecuador

AUTORIZACION DEL REPRESENTANTE LEGAL

Yo, Carolina Ana Maria Herrera, con cédula de ciudadania N [redacted], representante legal o tutor autorizado del estudiante [redacted], de la Unidad Educativa SAN LORENZO CODIGO AMIE 02H00157, autorizo que mi representado/a participe en el proyecto de investigación cientifica denominado: "A Quantitative Analysis of the effects of Project Based Learning on vocabulary recall", bajo la dirección y coordinación de la Pontificia Universidad Católica del Ecuador a cargo del Lic. Fausto Ortega.

Firma del representante.

Fecha: 14-05-2021

AUTORIZACION DEL REPRESENTANTE LEGAL

Yo, Beatriz Lessa-Montoya, con cédula de ciudadanía N. [redacted], representante legal o tutor autorizado del estudiante [redacted] de la Unidad Educativa SAN LORENZO CODIGO AMIE 02H00157, autorizo que mi representado/a participe en el proyecto de investigación científica denominado: "A Quantitative Analysis of the effects of Project Based Learning on vocabulary recall", bajo la dirección y coordinación de la Pontificia Universidad Católica del Ecuador a cargo del Lic. Fausto Ortega.

Firma del representante.

Fecha:

Si tiene alguna pregunta durante cualquier etapa del estudio puede comunicarse con:
Lic. Fausto Ortega, responsable del proyecto de investigación.

Correo: fausto.d.ortega.y@pucesa.edu.ec
Celular: 0979650401

Appendix 5. Traditional methodology plan (Sample)

<table>
<tr><th colspan="4">PLAN DE DESTREZAS CON CRITERIO DE DESEMPEÑO</th></tr>
<tr><td colspan="4">1. DATOS INFORMATIVOS:</td></tr>
<tr><td></td><td>ÁREA/ASIGNATURA:
Inglés</td><td></td><td></td></tr>
<tr><td>No BLOQUE: 1</td><td>TÍTULO DEL BLOQUE/ MÓDULO:
Personal Profile</td><td colspan="2">OBJETIVO DEL BLOQUE/MÓDULO:
To ask and give personal information about themselves and others</td></tr>
<tr><td colspan="2">EJE CURRICULAR INTEGRADOR:
To activate the communicative competence components through the development of the four language skills</td><td colspan="2">EJE DE APRENDIZAJE:
Speaking, reading, writing, and listening using English as a Foreign Language</td></tr>
<tr><td>ESTANDARES DE APRENDIZAJE
Learning standards:
Speaking, reading, writing, and Reading.</td><td colspan="3">DOMINIO A: Produce slow, hesitant, planned descriptions.
DOMINIO B: Understand and identify simple informational texts.</td></tr>
<tr><td colspan="4">2. PLANIFICACIÓN/ PLANNING</td></tr>
</table>

DESTREZA CON CRITERIO DE DESEMPEÑO A SER DESARROLLADA: Conjugate the verb “BE”in the first, second, and third person in the present tense when given an affirmative, negative, interrogative statements, and short answers with an accuracy of at least 70%.		**Indicador Esencial de Evaluación/ Essential assessment indicators.** They will be able to fill in the blank with the correct form of the verb BE. Students will get familiar to affirmative, negative, and interrogative structure of sentences.They will give a suitable short answer to questions.	
EJE TRANSVERSAL: Language	**PERIODOS: 6**	**Start date**	**Ending date**
ESTRATEGIAS METODOLÓGICAS METHODOLOGICAL STRATEGIES	**RECURSOS RESOURCES**	**INDICADORES DE LOGRO SUCCESS INDICATORS**	**TÉCNICAS / TECHNIQUES INSTRUMENTOS DE EVALUACIÓN ASSESSMENT TOOLS**
ANTICIPACIÓN Divide the class into three groups. Each group must select five letters (vowels & consonants).	English book Sheets Dictionary Computer Cardboard	Deliver a short, rehearsed monologue. Understand adapted and authentic texts which are simple and	**Techniques:** Observation Repetition Reading Translation

Using only the chosen letters, each group must form words. The group with the largest number of words wins. **CONSTRUCCIÓN DEL CONOCIMIENTO**: Draw a graph on the board with the conjugation of BE in the first, second, and third person singular. Then write in the first-, second-, and third-person plural. Make students to repeat the pronunciation as many times as necessary. Students have to complete affirmative sentences with the correct form of BE: am is,are.They have to get familiar with the structure of negative, interrogative statements, and short answers. **CONSOLIDACIÓN**: Students match the subject pronouns with their equivalent in Spanish. They translate Subject pronouns into English. They substitute nouns or names with the appropriate subject pronoun……..	Cd. Cd player	short. Identify simple informational texts by making use of clues such as visuals and reading one phrase at a time. Read aloud short sentences which are clear and simple.	**Tool:** Written Exercises Web Computer Oral lesson

Appendix 6. Project-Based Learning Plan (samples)

Project Milestones

Milestone #1	Milestone #2	Milestone #3	Milestone #4	Milestone #5	Milestone #6 Public Product
Entry event. Creating 4 groups Sharing the topics Sharing the project options. have students discuss the entry event and need to knows in pairs or small groups before engaging in a whole---class discussion. Translating vocabulary words. Asking the students to research about the top	Create and maintain a vocabulary wall for academic language associated with the project.	Have students develop personalized illustrated dictionaries to keep track of key vocabulary	Provide sentence frames to help students give and receive feedback. Provide students with exemplary writing samples and/or text frames to teach them about text and language conventions	Provide models to help students understand the appropriate “register.” Provide language models for different aspects of presentations (e.g., giving instructions, describing processes, comparing, and contrasting ideas.	Provide question frames to support audience members in asking effective questions.

	Scaffolding the Project Process How can you reduce linguistic or cultural barriers to project completion and success?	Scaffolding Content Learning How can you reduce linguistic or cultural barriers to content or skill mastery?	Scaffolding Language Development How can you support students' acquisition of English language skills within the context of a project?
Launching the Project: Entry Event + Driving Question	• Have students develop and use a BIE Project Team Work Plan to structure and organize their project work.[2, 5] • Post due dates and tasks to be completed to a project wall (virtual or in the classroom).[2] • Use the Question Formulation Technique to help students understand how to create effective questions.[6] • Provide closed and open sentence frames to support question generation.[8] • Brainstorm and sort the questions generated by students. Sort questions into categories that are easy for students to identify (e.g., Content Questions, Process Questions, Presentation Questions).[8]	• Use a KWL chart[7], question frames, and explicit modeling[8] for the need to know list to help capture what students already know about the topic and to support students in asking new questions.[1, 6] • During an entry event, use visual aids (e.g., photos, videos, physical objects) to help build context for learners at all levels of language proficiency.[7] • If the entry event is an "experience" (e.g., field trip, hands---on activity), have students use graphic organizers to keep their thoughts organized, or to write key words that can serve as memory triggers. A scavenger hunt is an useful strategy for a field trip.[7] • Use a camera, if possible, for students to capture experiences during the entry event or allow students to create visuals that they can later use to recall information and develop connections.[7]	• Explicitly teach and define content---related vocabulary during the discussion of the entry event.[2] • Create and maintain a vocabulary wall for academic language associated with the project.[8] • Use entry events as an opportunity to introduce students to different types of texts, and to discuss the conventions and purposes of text types.[4, 8] • To provide more opportunities for low---stakes speaking and listening practice, have students discuss the entry event and need to knows in pairs or small groups before engaging in a whole---class discussion.[5] • Avoid (or explicitly teach) colloquialisms and idioms in project---related resources (e.g., entry events, driving questions, rubrics).[4]
Build Knowledge, Understanding,	• Post daily objectives, in student friendly language ("I Can....") for content, skills, and language learning.	• Deliver instruction in a variety of formats (e.g., hands---on learning experiences, small group lessons, direct instruction, etc.)[7]	• Use observations and written tasks such as reflective journals to formatively assess student progress on language development targets.[3]

Appendix 7. English book guide (Sample)

TEACHER'S GUIDE / GUIA DIDACTICA
MODULE 8-1

PAGE 1

Area: Foreign Language/Lengua Extranjera

Subject: English/Inglés

Grade: 8

Lesson Title: Personal Profile

Grammar and vocabulary contents:

- Past continuous
- Present continuous
- Yes/No questions and WH-questions
- Present Simple (Review)

Related Subjects:

- Life cycles
- Muralism
- Geography
- Descriptive paragraph

Values:

- Internet Safety
- Education for change
- Social-emotional abilities

Page 1:

Teacher Tip: Introduce students to the English language through real facts. Reading out loud and small-group discussion is recommended.

Page 2: Communication and Cultural awareness

Teacher Tip: Reading individually in silence and speaking to engage students to some cultural aspects of the English language. Could be a pair discussion.

Answers: Anne-princess, Elizabeth-queen, country-England, city-London, April 12th, Charles-prince.

Page 3: Oral Communication

Teacher Tip: Listening comprehension and speaking production through some real sport academy information. Grammar focus: word FROM (use and omission) for countries and nationalities. The teacher can show students a YouTube video where students can see a real campus of the BCSS Academy. An additional speaking activity can be for students to say where their favorite sport players are from.

Sceipt:

INTERVIEWER: Hello! Can you tell us a little bit about BCSS?
STUDENT: Hi, sure! Bobby Charlton Soccer Academy is a prestigious soccer school based in the U.K. It receives over 1 million players from over 82 different countries.
INTERVIEWER: Where is it exactly?
STUDENT: Well, it is based in Manchester, England, but there are some other foreign ***camps.***
INTERVIEWER: Do students of the academy live at the camps?
STUDENT: Some of them. There are residential and non-residential soccer camps.
INTERVIEWER : Where are the students from?
STUDENT: Students come from all over the world. I know some people from Spain, Nigeria, Argentina, Australia and Italy. I'm Mexican and my couch is British.

Appendix 8. English book activities (sample)

Communication and Cultural Awareness

Do you recognize the woman in this picture? Where's she from?

Interesting people

Elizabeth II is a very famous queen. She rules the countries that form part of the United Kingdom: England, Scotland, Northern Ireland and Wales (see the map) and some other territories in Great Britain. They are all English-speaking countries.

She's from London, the capital city of England. Her birthday is on April 21st. She has four children: three boys; Prince Charles, Prince Andrew, Prince Edward and one girl; Princess Anne.

- Discuss the questions with your partner:

  Is there a queen in your country? Who rules your country? What language do people speak in your country? Do you know any other English-speaking country? Which one?

These words are in the text above, can you match them to the correct picture?

Anne

Elizabeth

country

city

April 21st

Charles

Vocabulary

queen. The wife of a king considered a ruler or monarch. A female ruler or monarch of a nation

prince. The son of the king or queen.

princess. The daughter of the king or queen.

rule. To decide, to use power, authority, or influence.

country. The territory or land of a nation.

English-speaking countries. Nations where people speak English.

Appendix 9. Projects (Samples)

Tourism Project Cover

Music Project Cover

Appendix 10. Photographs

Photograph 1 Tourism Project product public presentation

Photograph 2 Music Project Product presentation

Photograph 3 Recall Pre-test

Photograph 4 Recall Post-test