

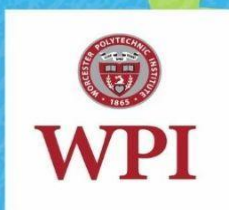
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# IMPROVING ACCESS TO ENGLISH LEARNING MATERIAL IN RURAL PANAMA

AN INTERACTIVE QUALIFYING PROJECT REPORT  
SUBMITTED TO THE  
FACULTY OF WORCESTER POLYTECHNIC  
INSTITUTE IN PARTIAL FULFILLMENT  
OF THE REQUIREMENTS FOR THE DEGREE OF  
BACHELOR OF SCIENCE

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# Improving Access to English Learning Material in Rural Panama

An Interactive Qualifying Project Submitted to the Faculty of the WORCESTER POLYTECHNIC INSTITUTE in partial fulfillment of the requirements for the Bachelor's Degree

This report represents the work of one or more WPI undergraduate students submitted to the faculty as evidence of completion of a degree requirement. WPI routinely published these reports on the web without editorial or peer review.

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October 13th, 2021

Sponsored By:

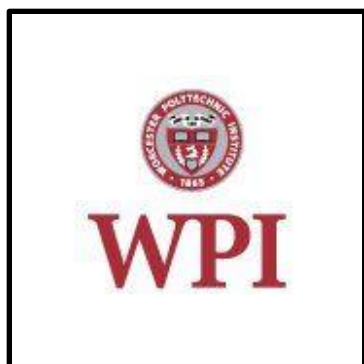
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## Abstract

Many rural areas lack the educational system necessary to improve their future generations' English skills. The goal of this project was to improve teachers' access to English learning materials by creating a self-sustaining virtual library in Panama. This library will help in the collection of material and will create a more connected school system within Panama. Through the guidance of our sponsor, this library allows teachers to upload and download English-learning materials to use in their school's curriculum.

## Acknowledgements

Our team would like to thank our advisors, Professor James Chiarelli and Professor Alex Sphar, specifically for their feedback, advice, and direction throughout our project. Without their input, this project would have lacked the intuitive revisions necessary to create a successful project for our sponsors.

Furthermore, we would also like to thank our sponsors for this project. Rick Montanari of Footprint Possibilities was an integral part of the development of our project throughout the whole process. Rick was in constant contact with our main sponsor, Jose Ríos of the International School of Panama (ISP), and relayed necessary information from our group to Jose. Also, a special thanks to Jose Ríos, who was an essential component in our project for not only assisting in the modifications of our project but also for distributing our surveys to the potential users of our project in Panama.

# Executive Summary

## 1 Introduction

This project developed a virtual library for teachers in Panama that will provide improved access to English-teaching materials. The virtual library that we designed will act as a hub where Panamanian teachers can upload and download English-learning materials seamlessly. It addresses Panamanian teachers' need for a platform where English-learning information can be seen quickly and easily. We created this library in Google Sites, due to its advantages in usability, shareability, and accessibility to teachers across Panamanian locations. We worked jointly with Jose Ríos of the International School of Panama (ISP) and Rick Montanari of Footprint Possibilities to gain an understanding of the aspirations of our project and the potential impact that this virtual library could have on English

teaching, not only in Panama but in the rest of the world.

## 2 Background

The Panama Canal has made Panama City an economic metropolis, containing superior jobs and livelihoods for the Panamanian workforce compared to other areas in Panama. This realization made some people migrate toward the city for the improved life and financial conditions for their future generations. Nevertheless, there are still a lot of people left in the rural, less-developed regions of Panama, many with a weak educational infrastructure.

Our sponsors for this project, specifically Jose Ríos of the ISP, expressed the constant demand for teaching materials in Panama and this was confirmed by Rick Montanari, who particularly called attention

to English-teaching materials. Thus, from the beginning of our project, we strived to ascertain the best method to improve the English-teaching material available to the teachers of Panama. Through our extensive research, we further discovered that there is a skill gap in Panama. This skill gap revealed that the bilingual education being offered does not line up with what labor leaders need from employees, especially in Panama City (Miller, 2020). This skill gap limits the job opportunities that students would have in the future, but through our project, it will be addressed if the teachers had a platform that made English teaching easier.

### 3 Methodology

Our project goal was to provide teachers in the rural areas of Panama with a convenient, self-sustaining resource in which teachers can access lesson plans, videos, or notes to teach English. We

wanted to simplify the process of lesson planning and foraging for material on the internet. Not only will the material included in such a virtual database be easier to navigate with more specific topics, but it will also ensure that all information included is from a reliable source with correct information. In comparison, when searching over Google there is no way to be certain that all information is coming from a credible source. In this virtual library setting, curriculums would be shared and integrated within one another, which also provides teachers with a cohesive teaching structure.

Our first mission was to find the best-suited platform. We decided that Google Classroom and Google Sites would be the top contenders of platforms to format our library. Google is a universal company that is free and easy to access by phone and computer, therefore it stood out to us when deciding on a platform.

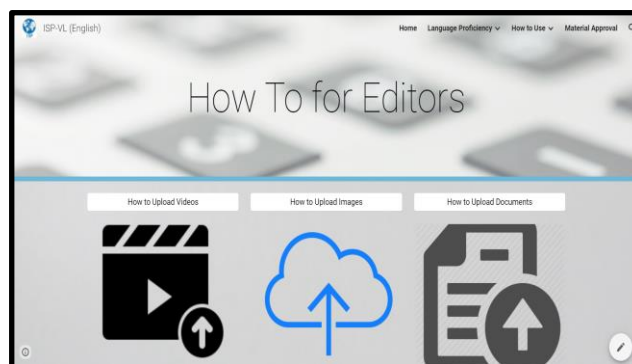
	Pros	Cons
<b>Google Sites</b>	<ul style="list-style-type: none"> <li>- Easily insert links, youtube videos, or worksheets</li> <li>- Secure document</li> <li>- Able to be distributed to multiple locations and schools</li> <li>- Accessible</li> <li>- User-friendly</li> </ul>	<ul style="list-style-type: none"> <li>- Editable by any teacher that has editor access</li> <li>- Needs administrator that limits the people who have access</li> </ul>
<b>Google Classroom</b>	<ul style="list-style-type: none"> <li>- Structured to fit a “classroom” atmosphere</li> <li>- Accessible</li> <li>- User-friendly</li> <li>- Teachers control information posted</li> </ul>	<ul style="list-style-type: none"> <li>- Used to teach students, not to be a virtual library of information</li> <li>- Layout options are limited</li> <li>- Focused on assigning work rather than material based</li> </ul>

*Figure 0.1: Pros and Cons of Google Sites and Google Classroom*

In this comparison, Google Sites stood out due to its organizational layout and ability to store information. This platform was more applicable to the teaching atmosphere, and since our target users were teachers, it was a clear decision. After we determined the platform and created a general layout of the virtual library, our group distributed two surveys for the teachers in Panama. The purpose of these surveys was to gain an understanding of our users and their specific needs,

ensuring that the library would benefit the users.

We received feedback from the surveys and were able to implement a “How to Use” page since many teachers were not explicitly familiar with the functionality of the virtual library.



*Figure 0.2: How to Use for Editors Page*

## 4 Recommendations and Conclusion

### Recommendations:

- Follow the guidelines and structure given in the User Manual (Appendix E)
  - Specifically, the editor(s)/owner should familiarize themselves with the Editor, Librarian, and Viewer roles and guidelines outlined in the User Manual
- Limit the number of people with *editor* access as it could result in the termination of the virtual library
- Distribute the published virtual library link to teachers that may use it, and inform them that they can upload their material through the “Material Approval” form
  - This is mostly how the site will be populated, so it is a crucial step in the development of this library

At the completion of the project, our team has produced a complete virtual library that has been shared with our sponsor, Jose Ríos of the International School of Panama. We have advised him to take note of the User Manual that we have written to guarantee a seamless transition of library ownership. In addition to the original virtual

library, we have shared a copy with Rick Montanari of Footprint Possibilities for his endeavors in other areas of the world. Through Rick Montanari, we hope to see the virtual library implemented in other places in the world looking to improve their bilingualism.



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## Authorship

<b>Section</b>	<b>Author</b>	<b>Editor</b>
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<i>Introduction</i>	All	Kevin, Zeñia
<i>Background - Intro</i>	Kevin	Kevin, Zeñia
Education in Panama	Kevin, Zeñia	Kevin, Zeñia
Education in Rural Panama	Kevin, Zeñia	Kevin
Electricity in Panama Education	Azat	All
Internet Usage in Panama	Azat	Azat, Madison,
Phone Usage in Latin America	Azat, Kevin	Kevin
Improving Bilingual Abilities of Panamanians	Zeñia	Zeñia
The Need for Virtual Library for Teacher's Material	Madison	Zeñia
Why Rural Teachers Need a Virtual Library	Madison	Zeñia
<i>Methodology - Intro</i>	Kevin, Zeñia	Madison
Objectives	Kevin, Madison, Zeñia	Kevin, Madison, Zeñia
Identifying Constraints	Madison, Zeñia	Kevin, Zeñia
Researching Similar Educational Platforms	All	Azat, Kevin, Madison
Understanding the Needs for Users	Madison, Zeñia	Azat, Kevin

<b><i>Findings - Intro</i></b>	Zeñia	Madison
Initial Survey and Results	All	Zeñia
User Testing Survey and Results	Kevin	Madison, Zeñia
<b><i>Recommendations and Conclusion- Intro</i></b>	Zeñia	Azat, Kevin
Recommendation	Zeñia	Kevin, Madison
Conclusion	Zeñia	Kevin
<b><i>Bibliography</i></b>	Kevin	Kevin
<b><i>Appendices</i></b>	Kevin, Zeñia	All
Editor Manual	Madison	All
Virtual Library	Zeñia	All
Surveys	All	Zeñia

## Chapter 1: Introduction

Panama is an economic powerhouse compared to many other Latin American countries especially due to the economic vitality of Panama City, rooted in commerce and financial services. The economy of Panama relies greatly on sectors such as transportation, tourism, and construction, which is centered around urban areas, mainly Panama City (Ulku, H., & Zaourak, G., 2021). After the ownership of the Panama Canal was transferred over to Panama in 2000, this allowed the country to finally prosper from global trade and take advantage of its geographical position in the world (Ulku, H., & Zaourak, G., 2021). The Panama Canal has made Panama City an economic metropolis, fit for improved jobs for the Panamanian workforce. This has made some people migrate toward the city due to the improved life and economic conditions for their future generations (Millett, 2021). Despite many Panamanians moving to the city, there are still many citizens left behind in the rural, less-developed areas. Although there has been a considerable reduction in nationwide poverty in Panama since 2007, the poverty rate among the native, rural population remained above 70 percent, and extreme poverty above 40 percent (Ulku, H., & Zaourak, G., 2021). Additionally, much of the “indigenous population’s access to basic public services—water, electricity, sanitation, internet—is lower in Panama than in the 12 other LAC countries with high indigenous populations” (Ulku, H., & Zaourak, G., 2021). Although Panama has a capital with enormous economic prosperity, through our research we found that the majority of Panama seemed to be deprived of that prosperity.

One main factor of stagnation in rural areas is the lack of advancements in bilingual education, which limits the job opportunities for the people in these educational systems. Teachers in rural areas do not have access to the same amount of support in English learning as

teachers do in urban areas. Materials to further English-speaking abilities for both teachers and students are often limited or not available to schools in underprivileged regions. There is rarely a convenient, commonplace in which teachers can access lesson plans, videos, or notes to teach English. Because these schools are further away from the city, they do not have connections with other schools and their resources for English learning.

The government of Panama acknowledged that they are falling behind in bilingual education, and as a result created an English reform program called the Panama Bilingualism Initiative (Zuniga, 2021). This reform program has generated some change throughout Panama's education system; however, it fails to reach all rural areas due to a lack of resources (Zuniga, 2021). In addition to this initiative, the International School of Panama (ISP) has made it their focus to assist these communities in rural areas. The ISP is a student-oriented independent school that educates its students in order to reach their fullest potential. ISP wants to inspire their students, so they can become positive contributors to their communities and the world.

With the assistance of the ISP, our team developed a possible solution for these rural schools that lack resources for supporting bilingual education. The schools in rural Panama could greatly benefit from a virtual library that the teachers can use in their everyday courses for teaching English. We researched similar platforms that assist with learning materials to create one of our own. We worked with ISP to conduct surveys for possible users to develop a virtual library that would allow teachers to upload and download materials as they please to enhance their English programs across the community. The surveys we conducted taught us what features of a virtual library were needed and which were helpful for these teachers. The goal of this project is to grant teachers and their students better access to information and English language teaching materials, improving on the minimal structure currently in place. Additionally, we hope

that by creating this platform, it could serve as a starting point for other countries looking to improve their bilingual educational programs.



## Chapter 2: Background

To ensure that we covered all aspects of the project, we had to conduct some contextual research on Panama itself. We focused on education in rural Panama, specifically rural schools' needs for assistance in bilingual learning. We also wanted to better understand the different factors that shape Panama's education system. Through our research, we established general information about education in Panama, then concentrated on their bilingualism. We researched the roles that electricity, internet, and phones play in Panama's educational system, and in which we identified a beneficial resource for Panama's English-learning infrastructure. Online education has been increasingly useful as the world has become more connected through technology. We researched virtual learning resources and the value they could add to teaching in rural schools. This research has allowed us to be better prepared to address the matter of bilingual education in Panama.

### 2.1 Education in Panama

Education is a vital necessity in communities all over the world, and Panama is no different. The infrastructure at all levels of education must be improved in order to sustain economic growth in the changing world (Zuniga, 2021). Things such as "expanding technical training, increasing bilingualism, and strengthening student funding" represent huge steps for Panama to enhance their education system across the country (Zuniga, 2021). People with superior education can acquire better jobs that lead to a higher standard of living, which includes access to even more educational resources for future generations. When more people in a society have access to improved education, it also benefits the country as a whole. The Panamanian education system varies widely from such systems in the United States. Panama separates the

different levels of education as primary school, grades 1st-6th, pre-secondary school, grades 7th-9th, and secondary schooling, grades 10th-12th. The Panamanian government controls its schools' curriculums. Panama only ranks 83rd in quality of education out of 144 countries (Oxford Business Group, 2015). Also, the present skill gap in Panama further illustrates their need for an updated educational infrastructure.

There is a skill gap in Panama that has unveiled that the bilingual education being offered does not line up with what labor leaders need from employees (Miller, 2020). Beverly Miller states that one of the objectives of her parents' generation was to "migrate to the United States, establish themselves financially and educate their children so that [they] could return and do what [her parents] longed to do but could not" (Miller, 2020). The educational systems in the United States, along with the ability to learn English efficiently was appealing to many people in Panama and other countries in South America. Miller also believes that "education is the great equalizer in developing countries." In economically unequal countries, where a small population holds a lot of the wealth, education can be a powerful tool to address the economic imbalance and improve the lives of the majority of people (Miller, 2020). Panama has one of the highest disparities of wealth distribution in the world, with a Gini coefficient of 49.8 (World Bank, 2021). This ranks in the bottom 20 countries in the world, showing Panama's struggle to keep financial balance within their people throughout their economy. Stronger education throughout Panama, specifically English education, would generate economic balance and diminish the present skill gap (Miller, 2020). Newer and better jobs in Panama require bilingual abilities, and this necessity should be addressed throughout the country's education system. Although Panama is ranked relatively low for education quality, it has been increasing the enrollment rate for all levels of schooling. The pre-primary enrollment rate rose from 62.1% in 2009 to 70.7% in 2013,

while primary school enrollment rates improved the most, rising from 52.3% in 2009 to 79.9% in 2013 (Oxford Business Group, 2015). Pre-primary schooling is mandatory throughout Panama, but in the rural parts of Panama, pre-primary education is not always available due to shortages of teachers, materials, etc.

As students proceed from lower to higher education in Panama, they may be presented with some opportunities to study other languages, such as English, abroad. In addition, the program “Panama Bilingue” was initiated by the government of Panama to develop not only the students’ abilities but the teachers’ abilities in English for the future of Panama. This program, established in 2014, has sent more than 10,000 teachers abroad to study English and is stated to impact over 200,000 students in the country (Zuniga, 2021). Although this program is believed to help the entire country, we wanted to focus on the rural areas that may not get as much attention.

## 2.2 Education in Rural Panama

In rural areas of Panama, their educational systems may suffer from a lack of teachers for the pre-primary level (Valvida, 2000). In addition to the lack of teachers, the infrastructure of many rural schools is weak or non-existent. Although the government has successfully increased enrollment rates in recent years, in rural areas schools often do not have enough space to hold all these students. Due to the fact that many rural areas in Panama are underdeveloped towns and villages, there is also a general lack of literacy-related programs such as libraries or bookstores that are accessible in countries that are better equipped like the United States (Brown & Shaklee,

2021). To address the space shortages in rural schools, some have introduced two-shift days which decreases the quality of education the students receive as the time they are in the classroom learning is cut in half. One of the main subjects that are negatively impacted by the two-shift-a-day classes is English. In order to address the weaknesses in education in rural Panama, we then investigated the resources available to the teachers and people around these areas.

## 2.3 Electricity in Panamanian Education

We needed to understand the technology that Panama is accustomed to because our solution to assist in Panamanian education would most likely come through a technological solution. Due to the state of the infrastructure in rural Panama, electricity has historically not been easily accessible for many people; however, these numbers are increasing and many schools have been gaining access to electricity. 67% of primary schools had electricity available to them while the pre-secondary and secondary schools had 84% of electricity available in 2010 (Oxford Business Group, 2015). Of the rural public primary schools, 55% of them received electricity supply from the electrical grid, 10% from solar panels, 3% from the power grid, and about 30% received no electricity in 2010 as well (Oxford Business Group, 2015). With increasing access to electricity, Panamanian schools are becoming more adept and able to support a technical solution for their educational needs.

## 2.4 Internet Usage in Panama

In addition to electricity, the ability to access the internet is crucial to the most successful educational systems in the world. Unfortunately, the distribution of resources in Latin American countries is often inequitable, and internet accessibility is low or limited in many rural regions. Most economic resources circulate only in the main urban economic hubs of these countries. Subsequently, schools in rural areas are often left to survive with very few resources. In Panama specifically, the total number of internet users in 2021 was roughly 2.63 million people, which is around 62% of the total population of Panama. This percentage of internet users can be considerably low in comparison to the United States percentage of around 86% of the total population having internet access (Clement, 2020). Even though the internet may not be as consistent in Panama as it is in the United States, teachers and students find ways to complete necessary work for schooling, sometimes even using their phones. A typical resident in rural Panama may not have a secure, wired connection to the internet, but most often they have a wireless cell phone connection due to its low cost and effectiveness around Panama. While Panama has historically lacked much internet connection, it is finally rising in accessibility to enable the country to utilize technology to gain more connection.

## 2.5 Phone Usage in Latin America

Although there are numerous areas without internet connection across Panama, the use of phones to reach the internet is an integral part of everyday life no matter where you are, especially for students. The usage of and access to mobile phones in Latin America is increasing

rapidly. Panama's total population is 4.28 million people, and they have a total of 4.86 million cell phone lines (Zuniga, 2021). Poorer households do not have the resources to buy and access a computer at their homes, so mobile phones are a natural alternative, especially since they are cheaper and easier to set up (Romero-Hall, 2021). The "proliferation of mobile technologies in Latin America has the potential to reach the region's marginalized population by increasing access to educational materials and programs" (Romero-Hall, 2021). After speaking with Jose Rios from the International School of Panama, we quickly came to the understanding that Panama is no different. Students of all ages tend to use their parents', or their own, cell phones in order to complete coursework along with their educational endeavors. While using their cell phones to complete course work, social media platforms also give the students the ability to expand their amount of resources to learn. There are a reported 2.4 million Panamanian cell phone users active within social media networking sites, covering the vast majority of people with internet access in Panama (Zuniga, 2021). Social media networking sites can also be an integral part of learning and they have been used more significantly in modern-day classrooms.

Networked learning through social media outlets has been implemented in some learning spaces in order to "mobilize knowledge," and to efficiently allow contemporary ideas to be presented through technology in a way students can easily relate to (Romero-Hall, 2021). In addition to social media platforms such as Instagram or Facebook, the popular video platform YouTube has also been a center for educational videos to be stored and seen by students on their own time on their mobile devices. The extensive use of mobile devices has recently been more commonly used by students throughout Latin America simply because they make the content and communication attainable at almost all times (Romero-Hall, 2021). We wanted to be able to appeal to this component of English learning in Panama within our project, so it was important to

recognize cell phone utilization and compatibility and how phones could be used to support students' English-learning capabilities.

## 2.6 Improving Bilingual Abilities of Panamanians

Panama, as a country, has low bilingualism rates. They participated in The EF English Proficiency Index, which is a ranking of countries that have had more than 400 participants take the EF Standard English Test. Panama was ranked 56th out of 60 countries for the average level of English skill amongst adults in 2013 (Vargas, 2017). There are some Panamanians that refuse to learn English because they want to maintain their national identity. Most students do not learn English while in school unless they attend a private school in which they gain a “‘working knowledge” of English’ (Vargas, 2017); students who attend more expensive private schools will reach an intermediate level of English.

The government of Panama was disappointed by this ranking, so President Varela created the Panama Bilingue Initiative in 2014. The Panama Bilingue Initiative included: teaching bilingual education to 2,000 teachers a year, improving bilingual education rates for 30,000 students in basic education, and improving rates for 20,000 secondary students per year (Vargas, 2017). For teacher training, teachers are sent to universities in countries like the United States of America, Canada, and the United Kingdom. This immersion program allows teachers to improve their English-speaking and writing skills. After-school programs have been added to provide additional hours to help with English. For students, learning English has now become mandatory for the primary and secondary level schools in Panama and that mentality has positively translated to the general population. A Panamanian local stated that “[their] international banking and business interests rest on the availability of bilingual professionals” and that “for [them], bilingualism is not a choice; it has become a survival necessity” (Valdivia, pg 22). This further



illustrates the indisputable fact that English is now, more than ever, a huge priority for current and upcoming students in Panama.

## 2.7 The Need for a Virtual Library for Teacher's Material

Teachers are plagued with a never-ending list of responsibilities in their efforts to educate their students. These teachers coordinate lessons, adhere to techniques to keep students engaged, and attempt to unlock excellence in each of their students; however, many professional educators have the responsibility to find and implement their own teaching materials (Lanier, 1997). This includes creating worksheets, finding online resources, and spending valuable hours searching through textbooks and the internet to formulate proper learning instruction. While the internet is the most promising resource to find these educational materials, this search tactic includes an overwhelming number of results that must be pieced together using multiple sources.

A virtual library is a vehicle to combine many individual efforts, allowing teachers to find and share high-quality, reliable sources of all kinds of media. Certain libraries are tailored to a specific subject matter, as a means to improve the productivity of searching. Others can be differentiated by the types of material it contains such as peer-reviewed sources, newspapers, encyclopedias, etc (Hillner, 2009). An education database will help to provide material tailored to students and teachers, in this case promoting bilingual education (Hirst, n.d.).

The goal when creating a virtual library for teaching materials is to simplify the process of lesson planning and foraging for the material. Not only will the material included in such a virtual database be easier to navigate with more precise topics, but it will also ensure that all

information included is from a reliable source with correct information. When searching over google, there is no way to be certain that all information is coming from a credible source. In this virtual library setting, curriculums can also be shared, which further provides teachers of any level a teaching structure of cohesion and conformity. Databases allow adaptations and additions from educators of all kinds which make the information published always the most up-to-date and relevant (Rusyn et al., 2018).

## 2.8 Why Rural Teachers Need a Virtual Library

Rural schools and learning environments must be approached differently than those in urban areas. On average, rural schools are smaller, which entails more individualized attention. The size also indicates that the teachers and students are local and don't have as much outside connection to the material used in other outside school systems. Teachers are exposed to isolation and animosity built around curriculum-related choices, as the communities most often operate with minimal outside help and the power structure of the small school system is often frayed (Baker, 2005).

An online database works to combat these issues as it supplies the teachers with a means of support in providing material to incorporate into their lesson plans. This way, it won't feel as if they have the responsibility to manufacture unique and masterful subject matter. Rural schools often also range in cultural beliefs that can affect how lessons are approached (Baker, 2005). A virtual library can work alongside these beliefs and be formatted to fit specific agendas as they are simply a resource and not a strict curriculum that must be followed exactly. Those in more

rural regions would still have the access to materials for subjects being taught on this platform as long as they have access to the site (Baker, 2005).

## Chapter 3: Methodology

The purpose of our project was to provide support to Panamanian teachers in bilingual education and thus improve English speaking throughout the area. With the world offering more opportunities to those who speak English, it is crucial that bilingualism efforts are started with the youngest generation to set a strong lingual foundation for the future leaders of Panama. After discovering this need, we began to create a virtual library for teachers to better find and store their English teaching materials. This platform enables teachers to share, store, and download teaching materials that correspond to numerous levels of English proficiency. Since schools in rural areas do not have the same support or resources for learning English as urban schools do, this shared virtual library will help these rural teachers be better equipped to educate students in the English language. Teachers also will gain the knowledge of newer technology and its abilities to help organize and share materials. In order to give these teachers the best platform possible to do so, there were a series of steps that we needed to address within the development of our solution.

### 3.1 Objectives

We developed the following objectives to achieve our overall goal for this project:

1. Identify constraints of our project.
2. Research similar virtual education platforms to identify best practices, and then create one of our own where we can establish a virtual library to assist with the English-learning process at rural schools.
3. Understand the teachers' and other users' needs from a virtual library.

Schools further from Panama City have more difficulty establishing and connecting with other teachers and their resources. Rural areas often fall behind in education, and, more specifically, they struggle with English language instruction. Panama has low bilingual rates overall, but it has become an increasing challenge in these remote areas. To help assist with English learning, the International School of Panama (ISP) asked for support to establish a virtual library that can help address this issue by storing, centralizing, and sharing teaching materials that teachers from rural areas of Panama can access and utilize. The ISP would like a database that allows teachers to upload and download lesson plans for English. This library would be used by teachers mostly for grades 1, 2, and 3, but would be available for higher levels of English learners as well. The chosen platform for the virtual library needed to have a sufficient amount of storage for all the different types of learning material such as PDFs, image files, and links. Other library restraints that we had to consider were its need to be free, easy to use, and universally accessible. Given all of these restraints, we were limited in the applications that we could choose from that encapsulated all of the functions necessary.

We not only needed to focus on the functionality of this virtual library, but we also needed to determine the structure of the library. Although many ISP teachers would have viewing access to this virtual library once it is published, we determined that there should also be an administrative staff who would be the only ones to have access to editing and publishing privileges. The ISP wanted this database to be unique to their school, therefore limiting access for outside faculty was essential when completing this project. Our group needed to establish security within the site that has viewer-friendly functionality, in addition to editor and publisher privileges. This was completed through the abilities of our application. We were able to create a link for the viewers to see the virtual library that was published while disabling their privilege to

edit the library's material. This means that viewers who visit the virtual library can only download and view the information available. Then, we were also able to generate a link for editor access, which would only be used by the administration, the ISP. In order for the virtual library to remain secure, the administration must be trusted and have the right knowledge of the library such that no significant errors or changes can be implemented in the library by an outside source. We had to ensure that the administration knew how to limit who the editors of the virtual library were, while also being able to send the correct "viewer" link to teachers who wanted to view the library. Overall, the administration will control the virtual library's material and editors, so they must have a grasp on the functionality of the library.

If there is an administration that understands the virtual library, we believe that it would be a great resource for Panama's rural schools to teach English efficiently. It could also be a useful tool for other countries beyond Panama. Countries that also have the desire to improve their native English-speaking capabilities may adopt this library for their own use as well.

### 3.2 Identifying Constraints

To fully understand what we could accomplish with this project, we first determined what the teachers need to promote English learning access. We could not prepare this virtual library to be successfully integrated within schools unless we knew what general information the teachers wanted to store and how they wanted to have access to that information. Initially, we planned to establish a platform that would allow the integration of English learning within the schools in Chepo, Panama. We were presented with numerous initial concerns, including internet connectivity, mobile phone compatibility, and offline/local access to this virtual library. It was also important for us to determine what the teachers had established as far as an English-learning

curriculum. After we found answers to all of these questions through constant meetings with our sponsors, we were then able to set the foundation for the virtual library and try to create the best product possible when it is left to the school.

We had to contact our sponsor, Jose Ríos of the ISP, and we asked him some initial questions to gain insight on the project and his ideas for the library. We thought it would have been beneficial to interview teachers at the Chepo school, however, given the time restraints and language barriers, it was not feasible to conduct such interviews. Our next best option was to administer a survey that would provide vital answers to our questions regarding the functionality and features of the virtual library. Through the surveys, we saw a broad range of opinions from people within the Chepo school community, and these provided more details about teachers in Panama and how they work on a day-to-day basis in rural Panama.

A virtual library requires an easy-to-use interface for the viewer, while also maintaining an efficient method to upload useful materials. Although we did not focus on what material would be implemented into this virtual library, we had to ensure that the material the teachers wanted to insert could be integrated well. Our direct sponsor, through the International School of Panama, insisted that our group focuses on PDF-type files, images, and legitimate third-party sites. Ultimately, the teachers that will upload to this library should be able to seamlessly add mostly any relevant material that can assist with their English-teaching curriculum.

### 3.3 Researching Similar Educational Platforms

In assessing how to construct our virtual library and its organization, we took a deeper look into sites that complete tasks similar to ours. Khan Academy is an example of an online learning resource that we assessed for functionality and organizational insight. Khan Academy is an education platform that specifically caters to teacher and student use at a given school. The topics provided on the site revolve around the math curriculum. All material used can either be extracted from the collection of lessons stored in the database or created by the teacher themselves. The organization of the site starts by grade level then consolidates into the category of assignments by topic. Individuals with access to the lesson plans and postings are the teachers and students.

We planned to implement a lot of these organizational features into our final virtual library. We particularly enjoyed the function to add material to the specific topics in Khan Academy and wanted to add that function into our virtual library. Also, we wanted to incorporate drop-down menus to access key sections of the virtual library, organized by English proficiency and grade level. We wanted our project to be accessible by more than just a single class and work for all viewers, while only allowing approved professionals to directly add material to the site. Eventually, we wanted anyone from any area to be able to access our site.

As a team, we decided that Google Classroom and Google Sites would be the top contenders of platforms to format our library. Google is a universal internet company that is easy to access and use by phone and computer. We set out to determine which would be the best to use through a comparison chart (Figure 3.1).



	<b>Pros</b>	<b>Cons</b>
<b>Google Sites</b>	<ul style="list-style-type: none"> <li>- Can easily insert links, youtube videos, or worksheets into this platform</li> <li>- Is a secure document through shared access between teachers (only teachers with access can edit the information)</li> <li>- Can be distributed to multiple locations and schools</li> <li>- Google is accessible for most people and is user-friendly</li> <li>- Can be used with an app on cell phones</li> <li>- Can be integrated with Google Classroom after posting the link to the Classroom or the Class Code</li> </ul>	<ul style="list-style-type: none"> <li>- Can be edited by any teacher that has access to admin abilities which could cause problems</li> <li>- Might have to have an administrator that limits the teachers/people who have access</li> <li>- Layout options are limited</li> </ul>
<b>Google Classroom</b>	<ul style="list-style-type: none"> <li>- Structured application to fit a “classroom” atmosphere</li> <li>- Google is accessible for most people and is user-friendly</li> <li>- Can have live posts from teachers to students to get live feedback/grades from assignments</li> <li>- Teachers control the information posted and can each have separate “classrooms” for their respective classes</li> </ul>	<ul style="list-style-type: none"> <li>- Is used to teach students, not used to be a virtual library of information for students</li> <li>- Layout options are limited</li> <li>- Focused on assigning work and getting grades rather than having a virtual library</li> </ul>

***Figure 3.1:** Comparative analysis of Google Sites and Google Classroom. This figure includes benefits and disadvantages of both Google Sites and Google Classroom.*

Google Sites stood out to us because of its organizational layout and ability to store information. Google Classroom differs as its layout is less compatible with a library reference, but its interface is much more applicable for an interactive teaching atmosphere. At this moment, we decided to establish our audience and the purpose of the virtual library. We needed to determine whether it would be used for the students directly or for the teachers directly. After

careful consideration and analysis of Google Sites and Google Classroom, we decided that we are going to use Google Sites since our target users are teachers in Panama, rather than students. A virtual library on Google Sites directly benefits teachers and their teaching material since all of the material will be stored on the site and free for anyone who has the site link.

A virtual library with Google Sites would enable the teachers to essentially have a database of information that they could reference when making classwork for their students. This library would act as the interface to integrate the learning material onto an online platform, and which can be sorted by subject, grade, English level, etc. The distinctive quality of this platform is that it would allow the editors of the site to include any type of information or file inside, with the ability to update it, compared to any other online dashboard. The administration in charge of the edits will not be limited in updating the lessons, if necessary. In addition, any lesson could be downloaded for educational purposes. This means that any teachers in the rural regions of Panama, who have any issues with the internet connection, will be able to effectively use these materials.

### 3.4 Understanding the Needs of the Users

In the construction of a functioning library system, it is crucial that the program works to fit the needs of the users. Only they can determine if the database will succeed or fail. We used surveys in the preliminary design of our library, and this was the best way to effectively consult our potential users for this library. The feedback from the teachers allowed us to be notified of key factors that were altered or implemented into our design. After the finished prototype of the virtual library was completed, we tested the software with a select group of teachers from our

initial implementation site of Chepo, Panama. User testing then uncovered how practical the key features of the library were, and finalized the organizational layout of the library.

Information that we hoped to gather from user testing related to the organization and navigability of the site, along with its functions of adding information and security passwords. We had to create walkthroughs to upload and download to the library, and those were placed as “How To” pages in the library itself. The prototype users were asked to review key features of the site regarding accessibility, security, and functionality. Through this method, we developed a good idea of how the teachers will approach the site and understand its layout and other functions. They were then asked to rate the features of the program and propose changes that they would like to see that would make the site either more sensible or include further functions that were missed in the initial design. The results from these questions gave us the best advice to improve the functionality when in the hands of the user.

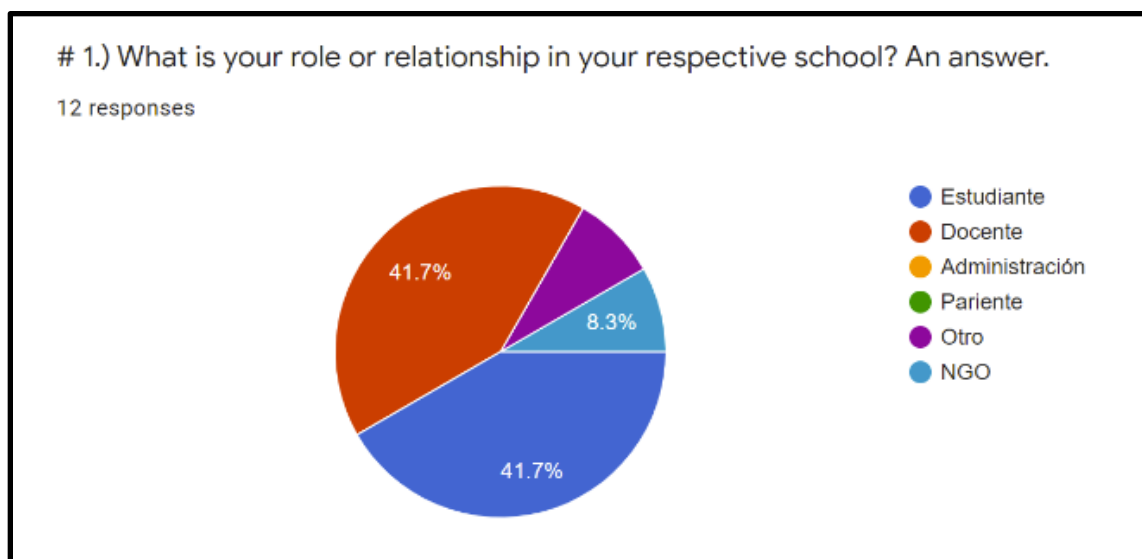
This was the best approach to get this data as consulting the customer or the primary users of the product were the opinions that mattered in the end. Since interviews can be very time-consuming and impractical to be completed over zoom with a variety of users, we did not consult any users through interviews. From the results of the survey data, we made applicable alterations to the library’s layout and functions, as well as add necessary features. After we dispersed two surveys over the development of our virtual library, we felt that we had the necessary input to finalize our project.

## Chapter 4: Findings

After initiating the Google Sites virtual library, we spoke with our sponsors, Rick Montanari and Jose Rios. In these meetings, we established a general layout and style for our virtual library. The surveys were used to gain data on the type of materials and the familiarity with the library, so in our meetings with Rick and Jose, we focused on the layout and functionality.

### 4.1 Initial Survey and Results

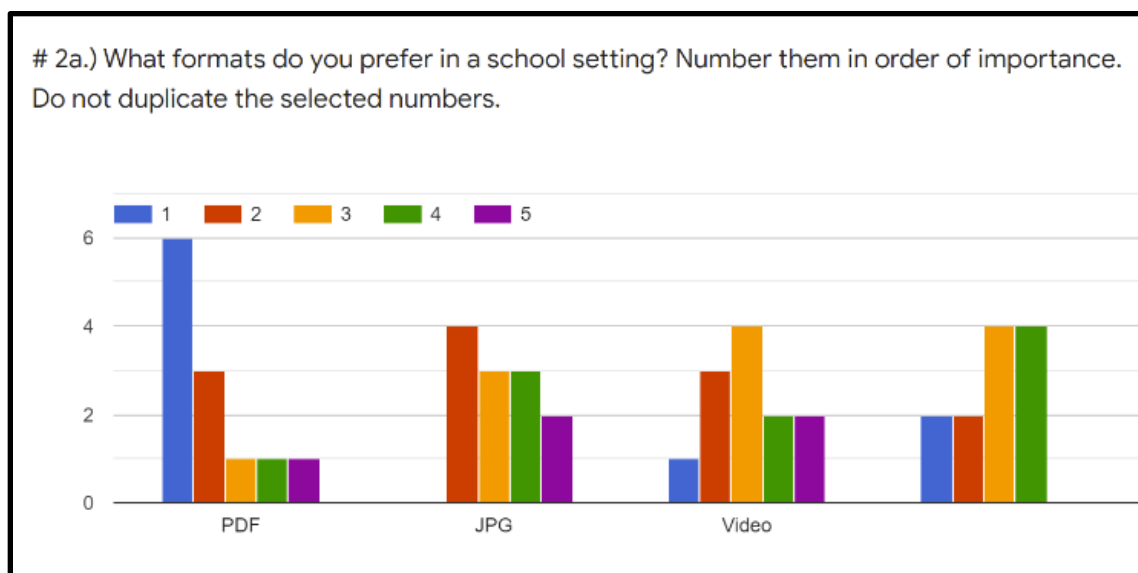
Our first survey was formulated to aid us in the development and organization of our library. The first question we asked was to understand the demographic of possible users. After gaining an understanding of who was answering the survey, we then went on to identify people's format preferences and their online habits within a classroom atmosphere. Other questions determined the internet connection and availability for our users and their familiarity with specific Google applications. Lastly, we wanted to investigate how our users would like to see the library organized. We displayed our findings in the figures below. We used this information to start building the virtual library that truly suits the needs of users.



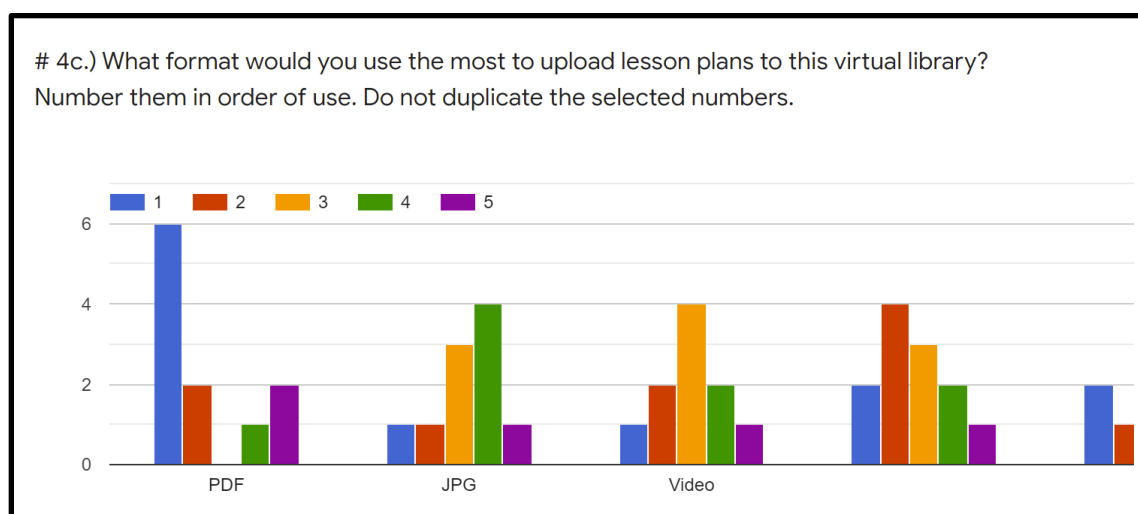
**Figure 4.1:** Survey 1 Demographic

Here, we wanted to know whether the people completing the survey were teachers, students, parents, or administration. As seen above in Figure 4.1, the people answering our survey were mainly students and teachers. We had to take this into account when analyzing the answers to this survey since our main audience was teachers. In our creation of the virtual library, we wanted to keep this detail in mind and orient the format to the setting most appropriate for the individuals using it.

The results of this question led us to understand that our site will need to be geared to the direct teaching and classroom setting. The library is not responsible for presenting to the use of NGOs or other administration which allows us to cut out the functionality of the site that would otherwise cater to them. We are determined to make this as practical as necessary to aid teachers in a classroom setting.



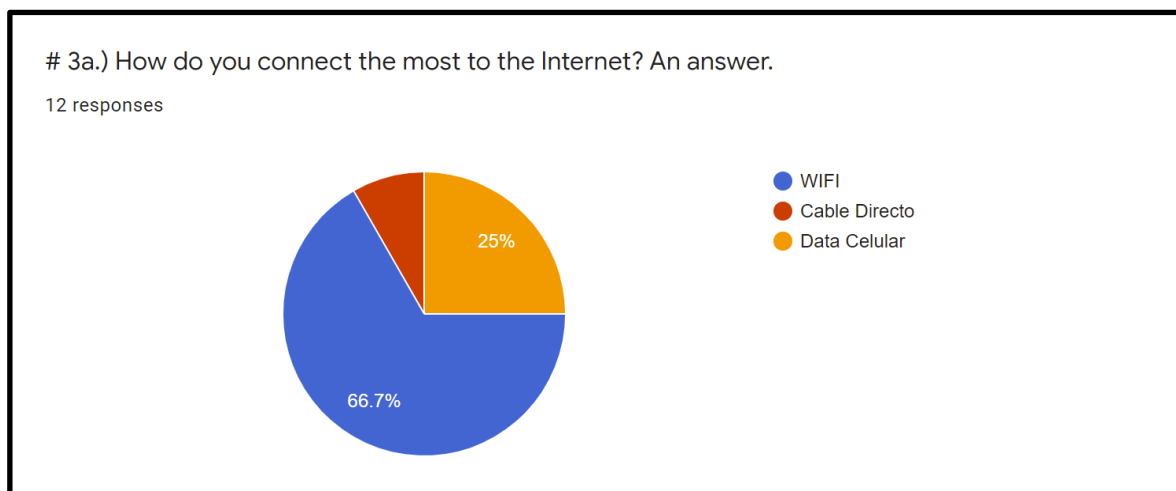
**Figure 4.2:** Preferred Formats (PDF, JPG, Video, Document/Microsoft Word)



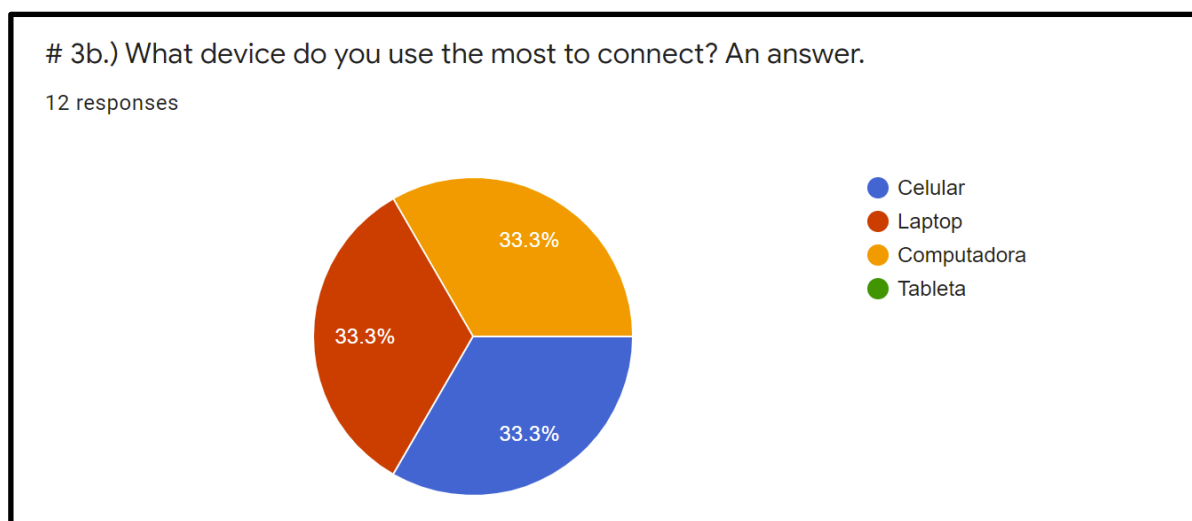
**Figure 4.3:** Uploading Formats (PDF, JPG, Video, Document/Microsoft Word, other)

To understand the kinds of materials that the teachers commonly use and want to see in the library, we consulted questions 2a and 4c from the survey (Figures 4.2 and 4.3). We asked the potential users to rank their preferred formats: 1 being the most preferred, and 5 being least preferred. These questions enabled us to see the most preferred format when teaching or learning

were PDFs. After seeing these results, we established a “How To” page to show how PDFs can be simply and efficiently inserted into our virtual library.



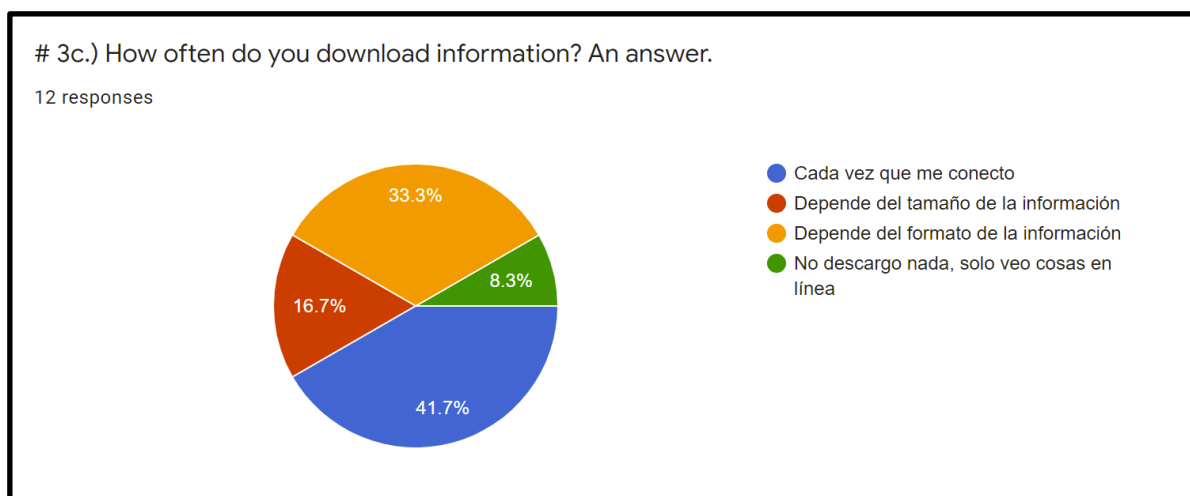
**Figure 4.4:** Internet Connection



**Figure 4.5:** Device Connectivity

In Figures 4.4 and 4.5, we hoped to better understand the role that the internet plays in the lives of our users. The results in Figure 4.4 told us that many of our users are able to connect with wifi rather than an ethernet cable or cellular data. Also, we learned from Figure 4.5 that

amongst our users there is an equal distribution between cellphones, laptops, and computers that they use for their work, showing that access to devices is not an issue.



**Figure 4.6:** Rate of Downloading Information

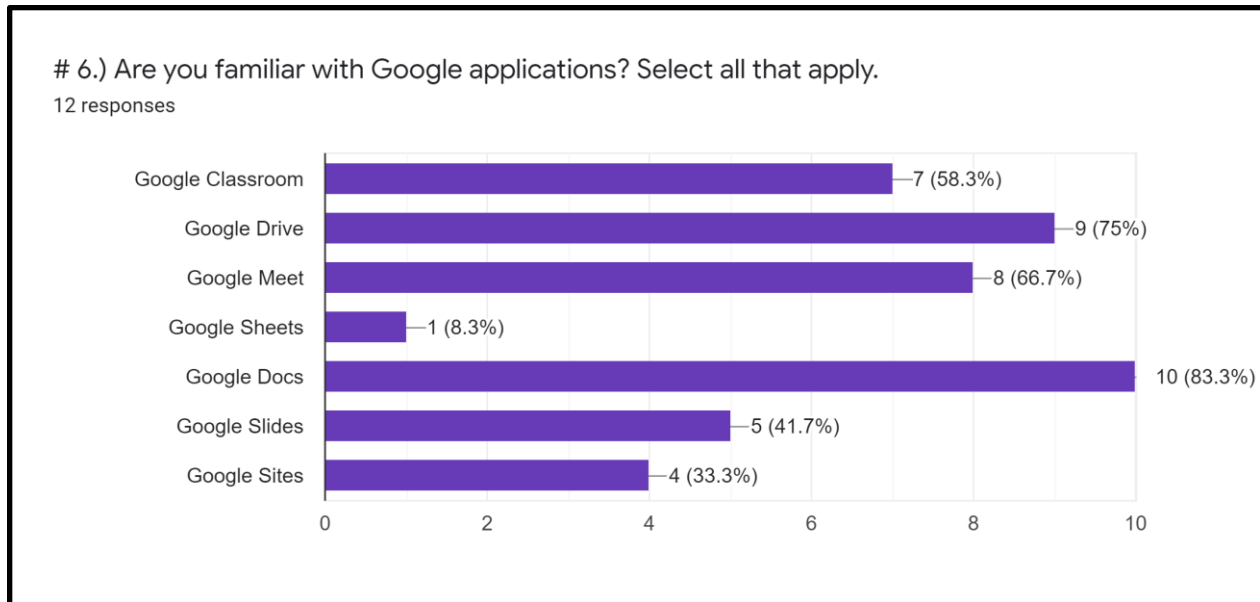


**Figure 4.7:** Virtual Library User Demographic

In order to discover the levels and layouts of the English-learning information that we would include in our virtual library, we wanted to recognize the grade levels that our users are



familiar with. We had our users rank, from 1 being most important to 5 being least important, the groups of students that they will be teaching with the help of the virtual library. This was essential to understand the scope of our project and the audience that we were pertaining to in the early stages of assembling this library.



**Figure 4.8:** Familiarity with Google Applications

Google, as a site, is universally familiar and available. Our hope in using a Google platform to display our site is that the users would already know how to navigate various applications. Figure 4.8 affirmed our thought process and many of the users answered being familiar with a variety of the noted programs. While only one-third of the participants are knowledgeable in Google Sites, the majority of the survey pool is informed of the other platforms which will make the transition to Google Sites smooth for them.

In our survey, we also asked our users what subjects the participants would want to display on the site. This question resulted in varying answers but overall revealed that all

subjects - math, science, social studies, etc.- were important to include. However, we realized that the library's main purpose was to provide materials for teaching English as a second language rather than teaching each subject in English. After this realization, we decided to include only reading, writing, and speaking in our virtual library. Instead of inserting generalized, broad information on multiple subjects like math, history, and science, we figured out that what really matters in learning a language were speaking, writing, and reading.

## 4.2 User Testing Survey and Results

The purpose of our user testing survey was to gain an understanding of how easy our virtual library was to use, and whether uploading or downloading materials was a complicated process. This was the first time anyone outside of our team and advisors would view and use the virtual library, so we wanted to ensure that the users had the proper knowledge of the site before they attempted to use it. To do this, we designed two "How To" pages that would be implemented in our virtual library with a step-by-step process showing people how to upload and download in the virtual library. These "How To" pages allowed people to use the library even if they did not have a technological background. Depending on what the user testers wanted to do, they were allowed to download or upload materials to the site. We sent this survey to our sponsors with limited time left in our project, therefore the answers to this survey were limited in quantity. Although this was true, we gained some feedback from a few users and have their general consensus below.

The first two questions we asked in the survey determined how easy the virtual library was to access and how helpful the "How To" pages were for the users. The users determined that

it was mostly easy to use, and the “How To” pages were helpful in understanding how to upload and download. One suggestion that was made was to integrate videos into the “How To” pages to make it easier to follow, which is a viable option; however, we did not have enough time in this project to incorporate videos. Even though we could not include instructional videos after we transfer the ownership of the virtual library to our sponsors, they may be able to create a video of their own and upload it to the library’s “How To” pages to make it easier for their users.

Another point we wanted to address in the virtual library was the descriptions for each English proficiency level. After we concluded that the levels of English proficiency were the best way to order the virtual library to reduce the user’s confusion, this required us to adequately describe each proficiency level in detail. We needed to make each proficiency level as objective as possible such that there were no misinterpretations within our users. Since this library is a self-sustaining library, the users of the virtual library need to know where to put their uploaded documents and where to find certain downloadable documents. Without this understanding, some users may look in the wrong proficiency level for teaching material or attempt to upload incorrect material for the respective English proficiency level. To address this, we asked if the proficiency level descriptions were helpful and if each user understood which level their material would go. The answers from this survey question confirmed our revisions to the virtual library as the user testers declared the descriptions to be very helpful and clear.

Lastly, we asked our user testers to rate the difficulty of uploading certain documents such as videos, PDFs, and images. One person had trouble with videos and images, whereas the rest of the user testers ranked all of the uploadable formats as easy to upload. Ultimately, the comments on the virtual library’s functionality were positive, and one user tester even commented that “the experience is new, it motivates us to scrutinize unknown things.” This was

very encouraging, and with these comments and results in mind, we are prepared to provide recommendations for our sponsor.

## Chapter 5: Recommendations and Conclusion

This project has proven to be effective for many teachers in Panama. We received positive feedback from our sponsor and some potential users within our surveys. To set up our potential users for success with the virtual library, we have created a manual that is simple and easy for anyone to understand, located in the appendices of this report (Appendix E). We wanted to ensure a seamless transition of the library. We hope to not only see our virtual library used by Panamanian rural schools, but also other schools in different countries looking to improve their English-teaching curriculum. We have faith that our work could have a positive impact globally.

### 5.1 Recommendations

When we sent out our User Testing Survey, we had potential users practice what it would be like to upload and download in the virtual library. Through our discussions with our sponsors, we realized that the different user types within the virtual library and the structure of the administration were not described enough. We recommend the users having three different roles: **editor**, **librarian**, and **viewer**.

The editors of the virtual library can be seen as the administrators. They need a Gmail account to be able to edit the library. They are tasked with approving the materials submitted to the “Material Approval” form in the virtual library, and they should be the *only people* to upload materials *directly* to the site unless they appoint a librarian to do so as well. The editor would also be able to change fonts, add titles, and create pages if needed. Think of the editors as the **owner** of the virtual library for their respective area, school system, etc. The editor is the owner of the virtual library and the Google Drive connected to it. The Google Drive will be connected

to the “Material Approval” form that is attached to their site. As other users send material through the Material Approval form, the editor will download adequate materials to their Google Drive and then upload them to the correct section of the library. The librarian(s) of the library are the people submitting material to the administrator to be admitted to the library. Lastly, we have the viewers, the people going to the library to have access to teaching materials. To make the transition of editorial duties as smooth as possible, we created a manual, located in the appendix. Our recommendations and guidelines for the editor are explained completely and in-depth in the Editor’s Manual in the Appendices of this report (Appendix E).

This manual explicitly lays out the instructions for using the virtual library. The “How To” pages located in the library make it easy for the viewers and librarians to understand, but the editors need to know more. As the editor, they are responsible for approving and uploading the materials being sent through the Material Approval form in the library. The Material Approval form on the virtual library can be filled out by an editor, librarian, or viewer. The approval form is connected to a Google Drive, which allows all the material in the library to be stored as a backup in case something goes wrong. The expectation is that the Google Drive connected to the virtual library will only contain materials for the library. The Editor Manual, or administrator manual, describes how to use that google drive along with explaining how to upload any materials (Appendix E).

## 5.2 Conclusion

With the virtual library and the Editor Manual complete, we are confident that the schools in rural Panama have a new, self-sustainable resource for English teaching material. In all our efforts within the project, we hope that we were able to help Jose Ríos, from the

International School of Panama, and Rick Montanari, from Footprint Possibilities, with the improvement of bilingualism in necessary areas. Since we used Google Sites to design our virtual library, it allows for adjustability. The backgrounds, captions, descriptions, language, and other aspects of the site can be altered by the editor to fit the needs of the user base. Since we worked directly with Jose Ríos, this rendition of the virtual library was designed for the International School of Panama and their endeavors. The home page image or even the language proficiency image can be changed to fit their school's logo and students. Through Rick Montanari, our sponsor from Footprint Possibilities, we hope to see the virtual library implemented in other places in the world looking to improve their bilingualism. The virtual library can be shared with many, and as long as the schools follow the editorial manual, they could benefit immensely from what the library can bring.

## Bibliography

- Bahamóndez, E. (2014). Exploring application, interaction, and interface design for educational use of mobile phones in schools in Panama.
- Baker, S. E. (2005). High-Quality Teaching: Providing for Rural Teachers' Professional Development. 26(2), 5.
- Brown, G., & Shaklee, B. (2021). Efficacy of Professional Development Schools in Developing Countries: Panama. 10.
- Clement, J. (2020). Topic: Internet usage in the United States. Statista.  
<https://www.statista.com/topics/2237/internet-usage-in-the-united-states/>
- Hillner, J. (2009, April 1). *Virtual libraries are teaching treasures*. Edutopia. Retrieved September 30, 2021, from <https://www.edutopia.org/digital-libraries>.
- Hirst, D. (n.d.). Subject guides: Education: Databases. Retrieved April 21, 2021, from <https://subjects.library.manchester.ac.uk/education/databases>
- Khan Academy. (n.d.). Khan Academy. Retrieved September 30, 2021, from <https://www.khanacademy.org/coach/dashboard>.
- King Miller, B. A. (2020). Walking in Two Worlds: An Autoethnographic Reflection of Establishing a STEM Program in Panama City, Panama. *Multicultural Perspectives*, 22(4), 220–226. <https://doi.org/10.1080/15210960.2020.1845174>
- Lanier, J. T. (1997, July 1). *Redefining the role of the teacher: It's a multifaceted profession*. Edutopia. Retrieved September 30, 2021, from <https://www.edutopia.org/redefining-role-teacher>.
- Millett, R. L. (2021). Panama—Settlement patterns. Encyclopedia Britannica.  
<https://www.britannica.com/place/Panama>
- Oxford Business Group. (2015). Panama makes progress towards sustainable education growth. Oxford Business Group. <https://oxfordbusinessgroup.com/overview/learning-curve-progress-being-made-towards-sustainable-growth-rising-budget-and-push-raise-post>



Romero-Hall, E. (2021). Current initiatives, barriers, and opportunities for networked learning in Latin America. *Educational Technology Research and Development*. Scopus.

<https://doi.org/10.1007/s11423-021-09965-8>

Rusyn, B., Vysotska, V., & Pohreliuk, L. (2018). Model and Architecture for Virtual Library Information System. 2018 IEEE 13th International Scientific and Technical Conference on Computer Sciences and Information Technologies (CSIT), 1, 37–41.

<https://doi.org/10.1109/STC-CSIT.2018.8526679>

Ulku, H., & Zaourak, G. (n.d.). *Unleashing Central America's Growth Potential*. Retrieved September 30, 2021, from

<https://documents1.worldbank.org/curated/en/782621618992892153/pdf/Unleashing-Central-America-s-Growth-Potential.pdf>.

Valvida, R. (n.d.). *Bilingual Preschool Education In the United States and Panama: A Comparative Analysis*. 46.

Vargas, D. (2017). Bilingual Panama: EFL Teacher Perceptions, Study Abroad in an Immersion Environment. *Journal of Language Teaching and Research*, 8(4), 669.

<https://doi.org/10.17507/jltr.0804.05>

*Overview*. World Bank. (n.d.). Retrieved September 30, 2021, from

<https://www.worldbank.org/en/country/panama/overview#1>.

Zuniga, J. A. (2021). Panama—Education and Training. <http://www.trade.gov/knowledge-product/panama-education-and-training>

# Appendices

## Appendix A: Initial Survey English Version

Hello! We are students at the Worcester Polytechnic Institute (WPI). We are working on our Interactive Qualification Project (IQP), which consists of volunteer work for communities abroad. The IQP has a project-based curriculum in which students work as a team to address the needs that lie at the intersection of science and society, such as education policy and the application of technology for improvement.

We are working with Rick Montanari from Footprint Possibilities Inc (FPP), a US charity company, and José Ríos from the International School of Panama (ISP). We need the support of both teachers, and students, to do our job and be successful. With your help, our team is developing a solution to support and assist with English learning in rural schools.

The purpose of this project is to create a shared virtual teaching library where teachers can access materials to educate their students in the English language. This virtual library would allow teachers to upload and download lessons as they would like to improve their English program. The creation of the virtual library would help teachers to acquire knowledge of new technologies and their abilities to help organize and share materials. The goal of our project is to give teachers and their students better access to information and teaching materials for English.

#1. Firstly, we would like to know who is responding to this survey. What is your role or relationship in your respective school? (multiple choice, one answer)

Student  
Professor  
Administration  
Relative  
Other\_\_\_\_\_

#2a. What formats do you prefer in a school setting? Number them from 1 (most used) to 5 (least used).

PDF  
JPG  
Video  
Native Documents, Microsoft Word, Excel, Powerpoint, etc.  
Other\_\_\_\_\_

#2b. What sources of information do you use the most? Number them from 1 (most used) to 5 (least used).

Wikipedia

YouTube

Search Engines (Google, Bing, Yahoo)

ISP Servers

Other\_\_\_\_\_

#3a. How do you most often connect to the internet?

Wifi

Direct cable

Cellular data

#3b. What device do you use to connect the most?

Cellphone

Laptop

Computer

Tablet

Other\_\_\_\_\_

#3c. How often do you download information?

Every time I connect

It depends on the size of the information

It depends on the format of the information

I don't usually download anything, I just view things online

Other\_\_\_\_\_

#4a. Would you upload lesson plans to the library if this function were offered?

Yes

No

#4b. Would you provide your name as the author of the upload?

Yes

No

#4c. What format would you most use to upload lesson plans on this virtual library?

PDF

JPG

Video

Native documents, Microsoft Word, Excel, Powerpoint, etc.

Other\_\_\_\_\_

#5a. What subjects would you like to see in the library? Number them from 1 (most important) to 6 (least important).

Grammar

Math

Science

Social Studies

History

Other\_\_\_\_\_

#5b. What age groups should be included in the library? Number them from 1 (most important) to 4 (least important).

Pre-K (Kindergarten)

Primary Students

Secondary Students

Other division\_\_\_\_\_

#6. Are you familiar with Google Applications? Select all that apply.

Google Drive

Google Classroom

Google Meet

Google Sheets

Google Docs

Google Slides

Google Sites

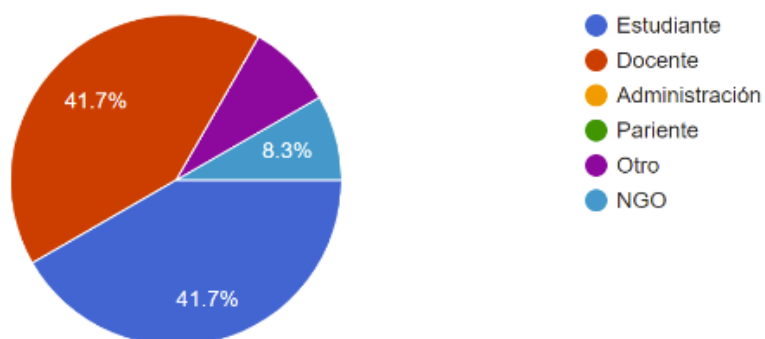
Other\_\_\_\_\_

#7. Do you have any concerns regarding the functionality of the virtual library that we should be aware of?

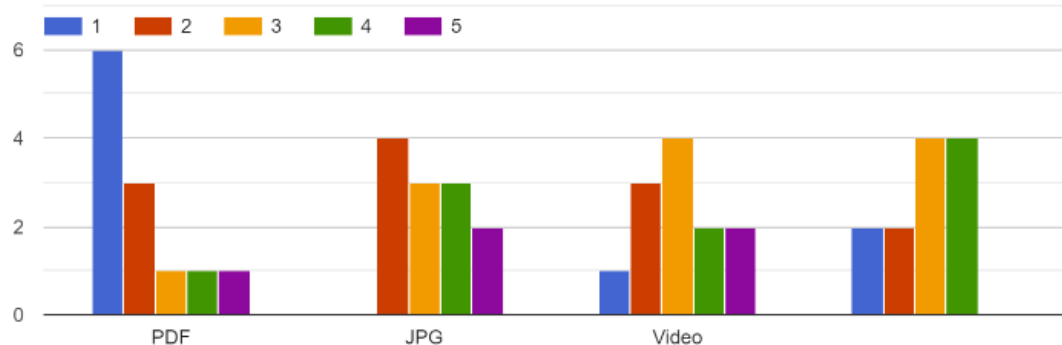
## Appendix B: Initial Survey Results

# 1.) What is your role or relationship in your respective school? An answer.

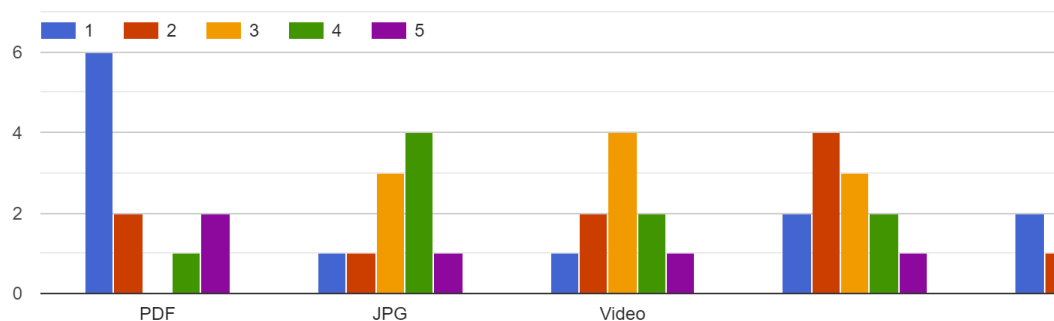
12 responses



# 2a.) What formats do you prefer in a school setting? Number them in order of importance. Do not duplicate the selected numbers.

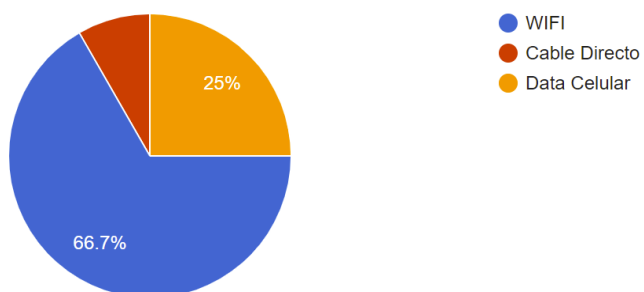


# 4c.) What format would you use the most to upload lesson plans to this virtual library?  
Number them in order of use. Do not duplicate the selected numbers.



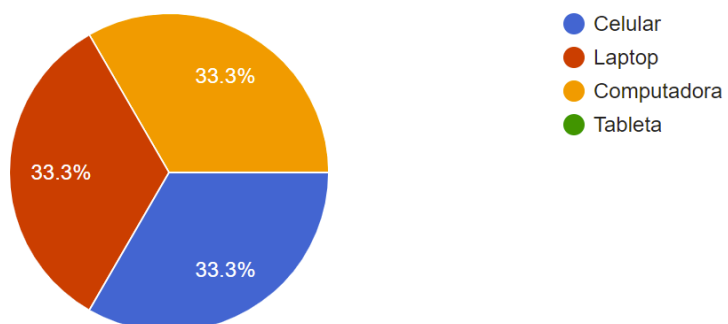
# 3a.) How do you connect the most to the Internet? An answer.

12 responses



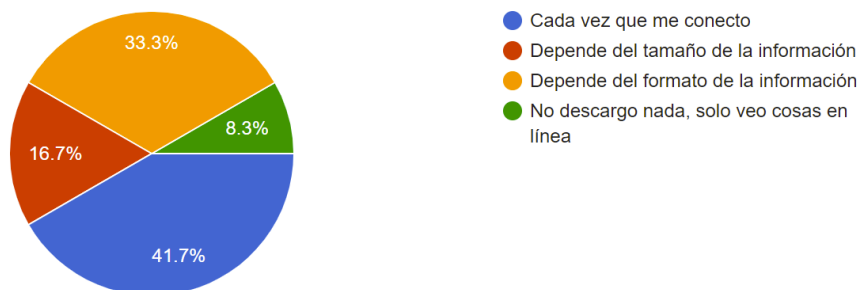
# 3b.) What device do you use the most to connect? An answer.

12 responses

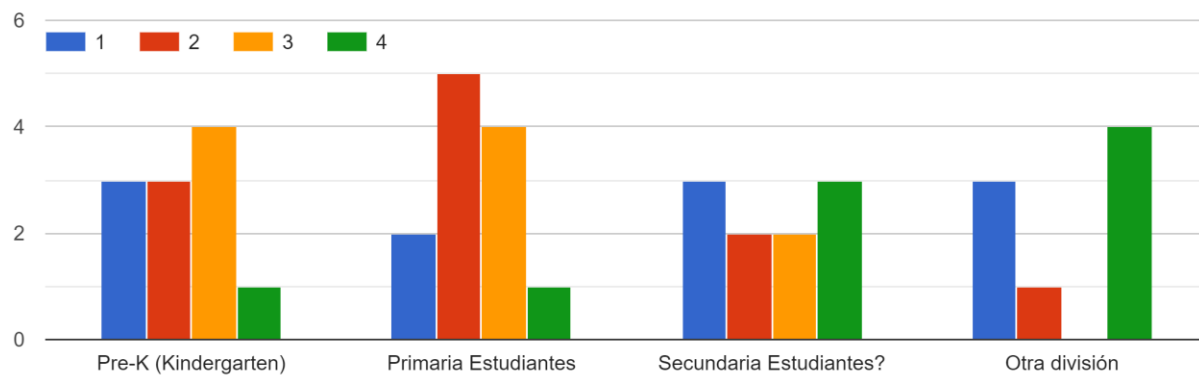


# 3c.) How often do you download information? An answer.

12 responses

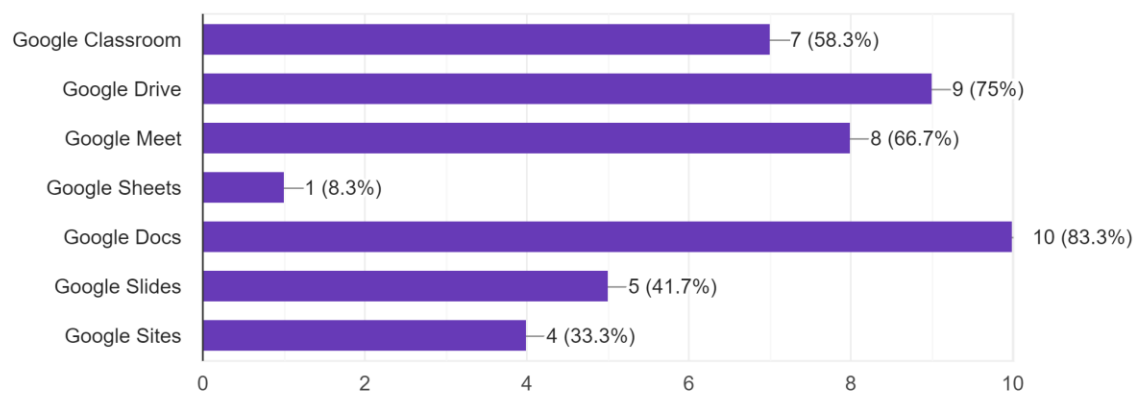


# 5b.) What ages should be included in the library? Number them in order of importance. Do not duplicate the selected numbers.



# 6.) Are you familiar with Google applications? Select all that apply.

12 responses





## Appendix C: User Testing Survey English Version

**Intro:** Thank you for taking your time to test out our Virtual Library. We want to remind you that this survey is anonymous, and we appreciate your honesty. Before you complete this user-testing survey for our virtual library, please follow these short steps to familiarize yourself with our prototype virtual library:

1. Please open our Virtual Library link here: **\*link to library for viewers\***. This link will show you the published view of the site.
2. On the Virtual Library Home page, please read the descriptions of each language proficiency level.
3. Click on the How To Use page which has instructions for Editors and Viewers.
  - a. Do not worry about the “Material Approval” page since this is a test of the virtual library.
4. Please do not click “unpublish” button or change the theme of the site

This library is centered around a Google application called Google Sites. If you want to practice being an editor for the virtual library, you must have a Google Email (gmail) account. There is a “How to Create a Gmail” page for those who wish to create an account. However, if you just want to view the virtual library, you can use any email you want.

*\*If you do not have a gmail account, skip being an editor and be a viewer instead\**

A) To practice being an editor click this link:

<https://sites.google.com/d/19j6A2B3jvd37uArHBq829J46PO8VTE73/p/1zOYZjNeXJyWTSJ2-4FUplQTPgOq3NMAo/edit>

- a. Practice uploading videos under the speaking tab of any of the language proficiency levels.
- b. Practice uploading written handouts under the writing tab or readings to the reading tab for any of the language proficiency levels.

B) To practice being a viewer click this link: *\*link to library for viewers\**

- a. Under the speaking tab, try using the video links there.
- b. Under the writing tab or reading tab try downloading the documents.

After completing the mentioned tasks, we would like you to answer these questions based on what you completed above:

#1) How difficult was it to access the virtual library? Choose the difficulty from 1 (difficult) to 5 (easy).

1→ difficult

2

3

4

5→ easy

#2) Was the “How To” page helpful? Pick a number 1 (not helpful) through 5 (helpful).

1→ not helpful

2

3

4

5→ helpful

#3) How did you like the layout of the virtual library? Pick a number 1 (clear and useful) to 5 (confusing and not useful).

1→ Confusing and not useful

2

3

4

5 → Clear and useful

#4a) Were the descriptions helpful for each proficiency level? Did you understand what to put in each proficiency level? Choose a number 1 (not helpful) to 5 (helpful and easily understood).

1→ not helpful

2

3

4

5→ helpful and easily understood

#4b) If your answer to the question above was no, what improvements do you recommend?

---

---

---

---

#5) Rate the difficulty of uploading or downloading the following formats on a scale of 1-5. (5 being super easy, 1 being super hard)

	1	2	3	4	5
Documents					
Videos					
Images					
Other					

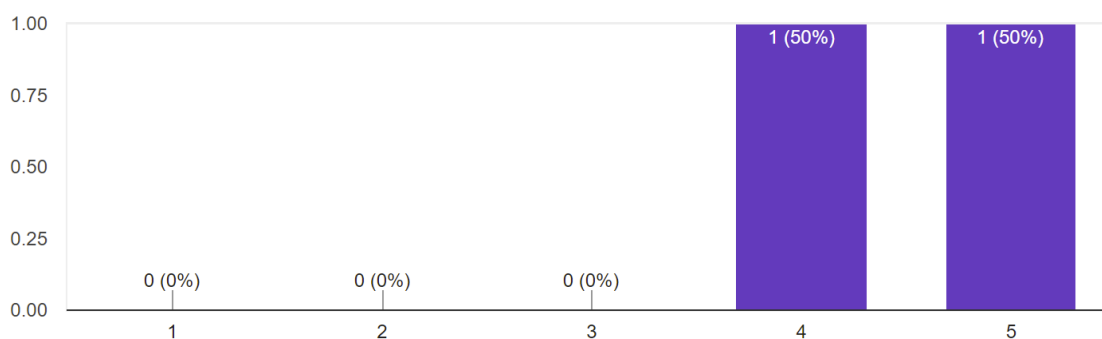
#6) How was your overall experience using the Virtual Library? (written answer)

## Appendix D: User Testing Survey Results

### *English Responses from Worcester Polytechnic Institute Students*

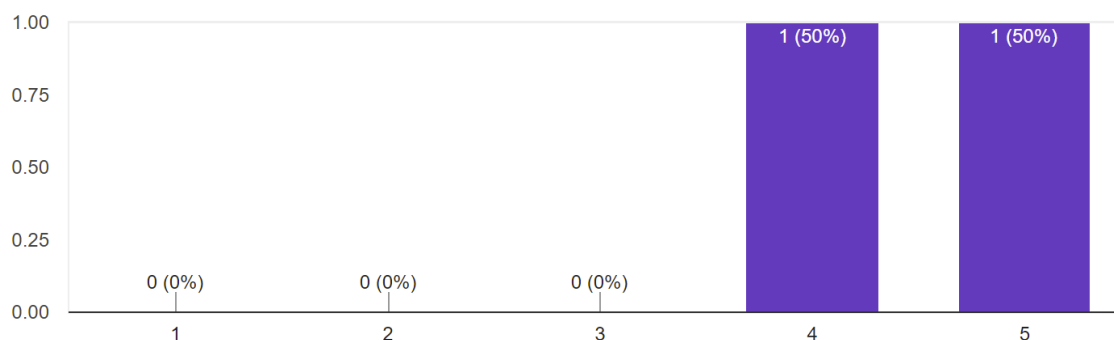
1. How difficult was it to access the virtual library? Choose the difficulty from 1 (difficult) to 5 (easy).

2 responses



2a. Was the "How To" page helpful? Pick a number 1 (not helpful) through 5 (helpful)

2 responses



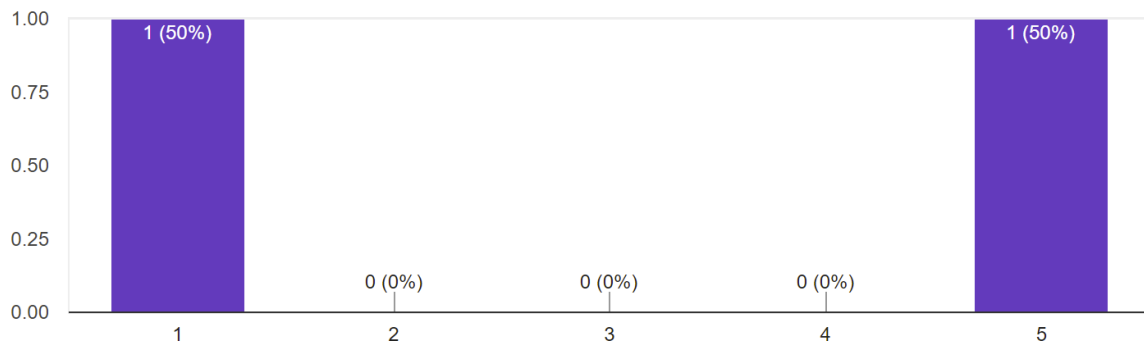
2b. Describe the problems, if any, that you had with the "How-To" pages.

1 response

In the first step example for uploading a video, the font size in the text box was quite small in the picture.  
Other than that, everything else was helpful and clear

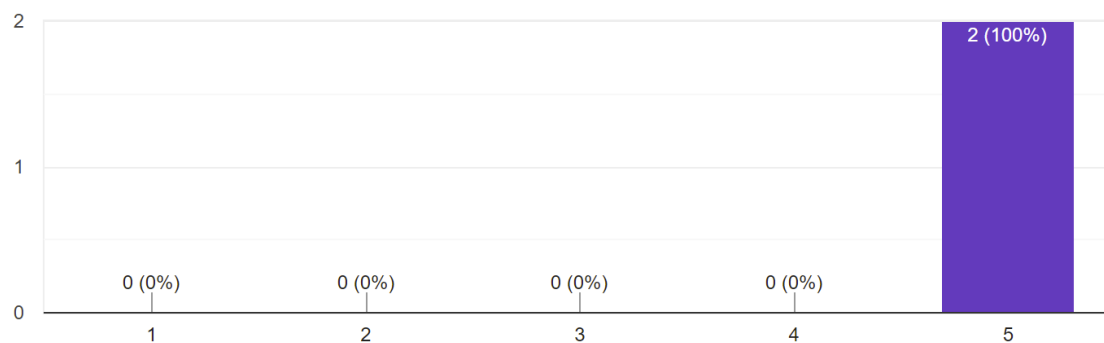
3. How did you like the layout of the virtual library? Pick a number 1 (clear and useful) to 5 (confusing and not useful).

2 responses



4a. Were the descriptions helpful for each proficiency level? Did you understand what to put in each proficiency level? Choose a number 1 (not helpful) to 5 (helpful and easily understood)

2 responses

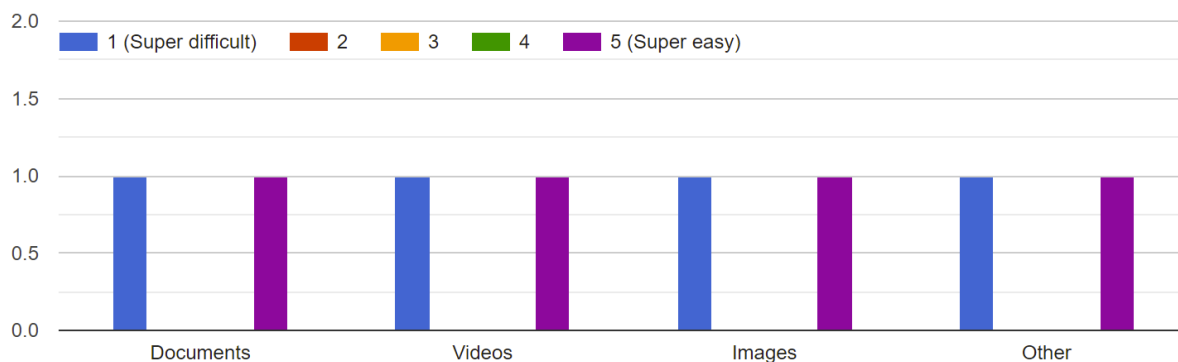


4b. If your response to the last question was "not helpful", what would you suggest?

0 responses

No responses yet for this question.

5. Rate the difficulty of uploading or downloading the following formats on a scale of 1-5. (5 being super easy, 1 being super hard)



6. How was your overall experience using the Virtual Library? (written answer)

2 responses

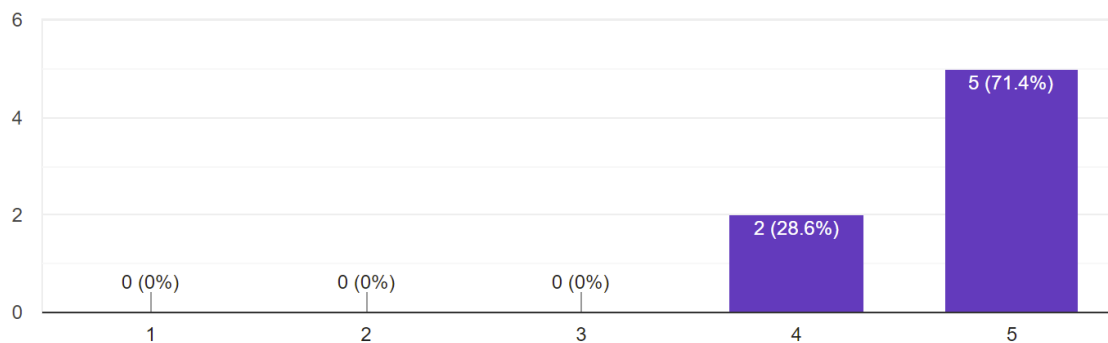
It was an easy experience. Everything was pretty clear. Also for when I went to use the video links and to download documents, there weren't any information or links posted past the novice English level. I'm assuming that you are all still adding more things to the website, so the previous comment isn't really a big deal

As a suggestion I would add a link to the "How to publish" under the "How to upload".

### Spanish Responses from Possible Users

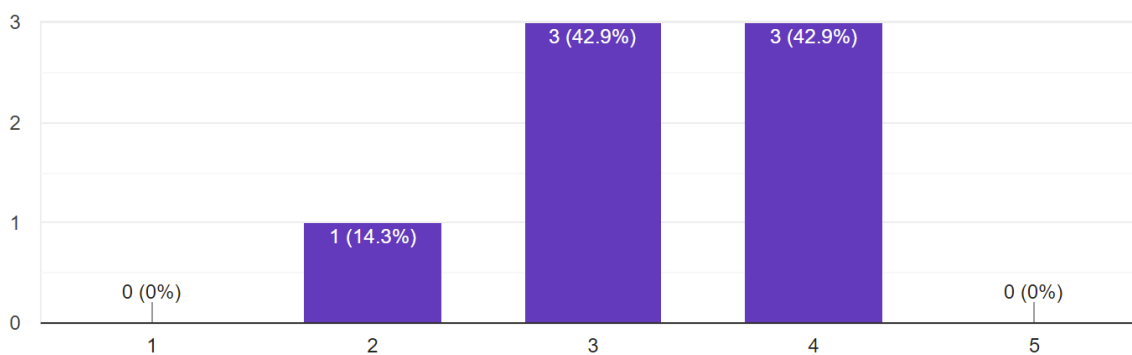
# 1) ¿Qué tan difícil fue acceder a la biblioteca virtual? Elija la dificultad de 1 (difícil) a 5 (fácil).

7 responses



# 2) ¿Le resultó útil la página “Cómo hacer”? Elija un número del 1 (no es útil) al 5 (útil).

7 responses



Describe cualquier problema que hayas encontrado al leer la página "Cómo Hacer".

5 responses

Ninguno, fuera bueno agregar videos bajo la página de cómo utilizar

Fue entendible

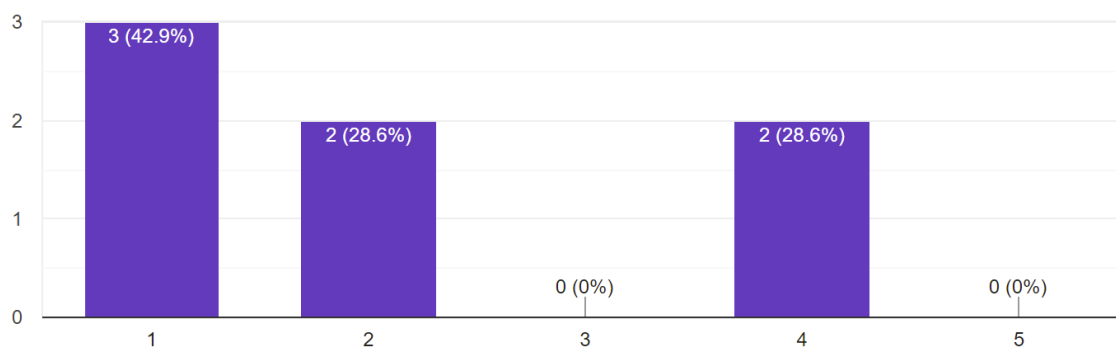
No hubo problemas

Faltaba los complementos de cada tema

No hay opcion "Cómo Hacer" pero "Como Utilizar", los iconos para las opciones son muy grande y hace pensar al usuario que se debe hacer click en la imagen y no en el nombre de la opcion

# 3) ¿Qué le pareció el diseño de la biblioteca virtual? Elija un número del 1 (claro y útil) al 5 (confuso y no útil).

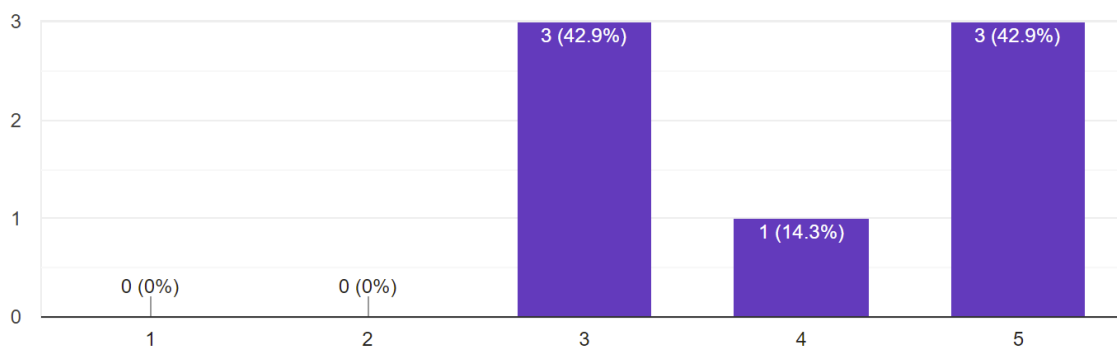
7 responses





# 4a) ¿Fueron útiles las descripciones para cada nivel de competencia? ¿Entendió qué poner en cada nivel de competencia? Elija un número del 1 (no es útil) al 5 (útil y de fácil comprensión).

7 responses



# 4b) Si su respuesta a la pregunta anterior fue negativa, ¿qué mejoras recomienda?

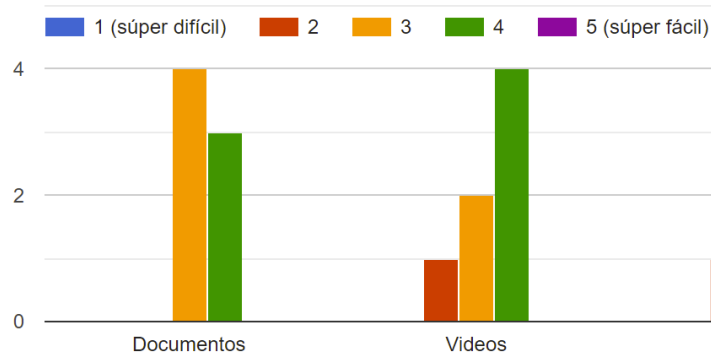
3 responses

Incluir o edad o el grado del estudiante en escuela como medidor de la competencia en cada nivel.

Colocar los complementos

Aunque mi respuesta no fue negativa, deberían de utilizar la misma palabra/persona para describir el usuario, cada uno tiene uno diferente lo cual puede confundir

# 5) Califique la dificultad de cargar o descargar los siguientes formatos en una escala del 1 al 5. (5 es súper fácil, 1 es súper difícil)



# 6) ¿Cómo fue su experiencia general al usar la Biblioteca Virtual? (respuesta escrita)

6 responses

Video de tamaño es limitado. La función de PUBLICAR no está clara y ocupa mejor Tutorial para aprender como hacerlo.

Es nueva la experiencia, nos motiva a escudriñar cosas desconocidas.

Fue agradable, muy sencilla de usar y con un buen diseño.

En novicio, en la página de Ciencias y Matemáticas están vacías.

Aceptable

No pude ver ninguna forma o video, no se si es que porque nadie ha subido nada (pero yo tampoco intenté crear ningún formulario o archivo).

## Appendix E: User Manual

# User Manual

WPI ISP IQP Virtual Library Instructions for Users  
A guide of the organization and functions of a virtual library

By: Azat Mukhametkulov, Kevin McGonigle, Madison Garrity, Zeñia Alarcón

Advisors: Professor James A. Chiarelli and Professor Jefferson A. Sphar

Sponsors: Rick Montanari of Footprint Possibilities and Jose Rios of the International School of Panama

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# Introduction

This manual is to be used in conjunction with the final virtual library project deliverable. It goes step by step through all of the main functions and abilities of the site. It also goes into depth explaining the different roles of users of the library. This is to be used to guide all navigational and functional means.

The first section outlines any and all **Important User Guidelines** that can if not followed, lead to the library's unpublishing or hacking. There are backup plans in place to prevent such disasters with the site, but if the warnings in this section are followed by all users, specifically editors, the site will run without problem.

Shortly after, the manual will cover **General Information** regarding the design of the library, which will cover the **Library Display**, the **Proficiency Level Breakdown**, and the **Organization of Material**. This section is to be referenced by all users alike as it gives an insight into how the site is organized as a whole. The display explanation will show images of the site and depict the dropdown features and navigation into different pages. The level breakdown explains how each language proficiency is determined to separate the material in terms of difficulty. Subjects and the division of information will lastly be explained.

We recommend that there is a structure for the administration and for the viewers. There are three types of users/people within this library, and we will go into detail of each in order to ensure that the virtual library functions to the best of its capability. As a summary:

## **Editor**

The editor, or editors, are the owners of the virtual library. The editors are at the top of the administration. The editors can change the virtual library's properties, upload materials, and ultimately do anything they want to the virtual library. Amongst the editors, there would be a person responsible for an error on the site as well. The custodial responsibilities that this kind of editor will hold will be managing the site backups and monitoring

## **Librarian**

The librarian, or librarians, will cover the workability and longevity of the site and serve as preventative damage control. The librarians are responsible for ensuring the virtual library is up to date and has English-teaching material. They should submit material to be approved by the editor with the "Material Approval" form which contributes to the content of the library.

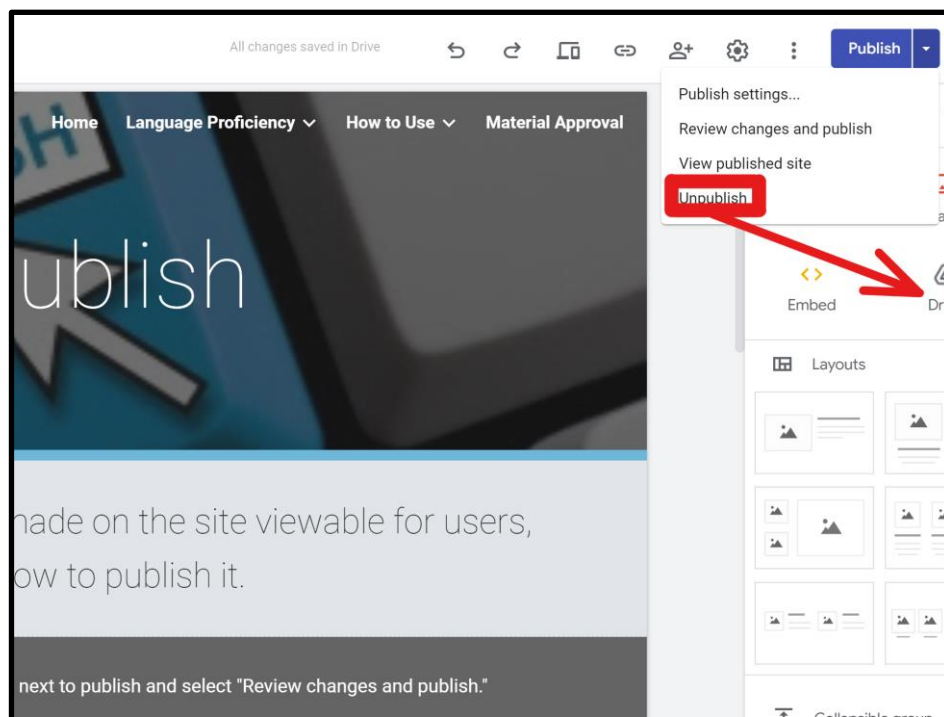
## **Viewer**

The viewers are anyone who wants to view the published site. Viewers can download teaching/learning materials from the site from anywhere they want. They can also submit English-learning material through the "Material Approval" form in the virtual library. The approval form effectively allows the viewers to upload English teaching materials without giving them any substantial access to edit the virtual library. This process also ensures that the material goes through a filtering process by the editor and librarian before getting published.

Within the user descriptions, the manual will dive into each feature and command that each unique position will be responsible for. It is very important to understand what role a user is, so they may use the manual as a reference when using the site or if any questions arise.

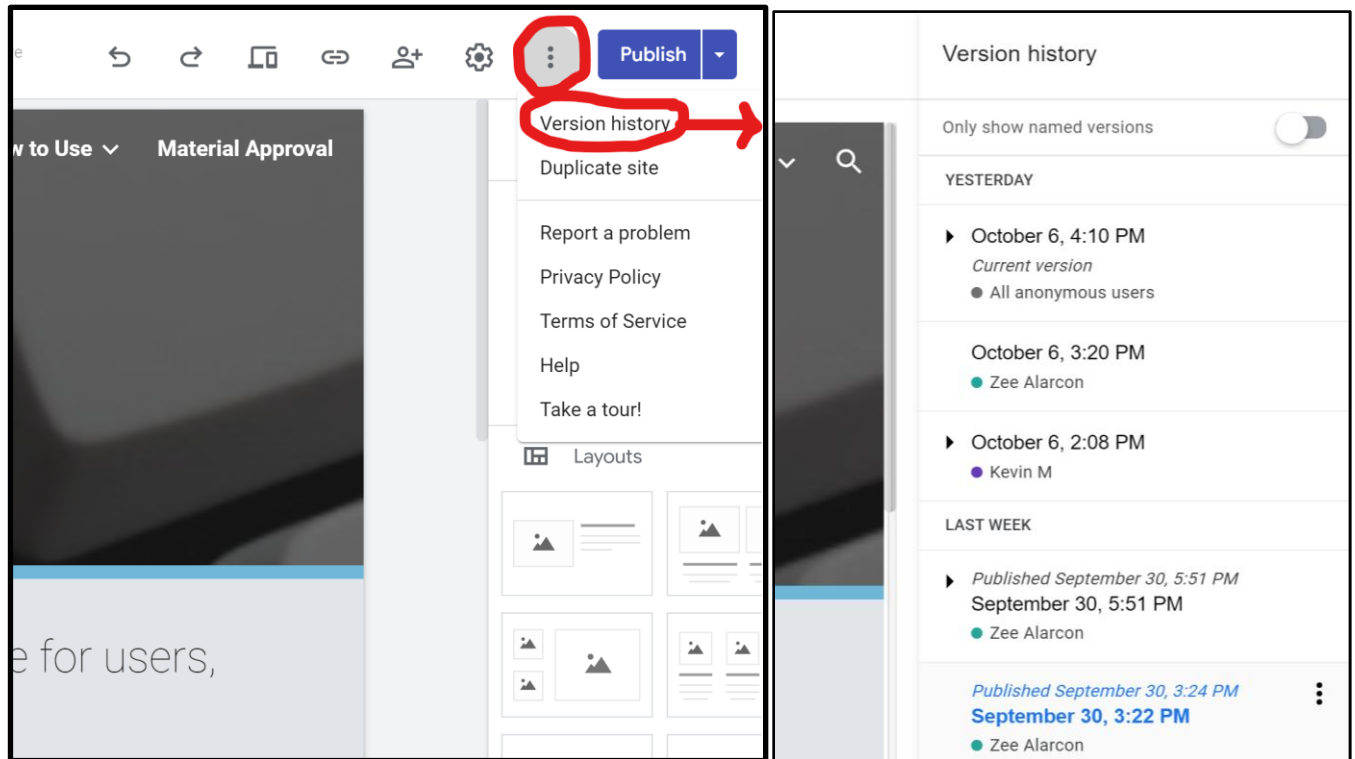
## Important User Guidelines

The unpublish button is located in the top right hand of the editable library. Pressing this button will remove the site from being visible to the average viewer in its most recent published state. This button is **NOT** to be selected by any editor as it does not just remove your own work but all the information on the site as well. Do not press this button unless given explicit instruction from the lead contact of the site.



Deleting other editors' work is also not allowed without their notice. Each editor works independently and their work can be traced back by the version history. Always check with custodians, the person responsible for an error on the site, or the lead organizer before changing/altering work. If any issues are found by any user of the site without editing access, they are encouraged to email the designated owner of the site.

To see the version history and find who made what changes, the three dots must be pressed in the top left corner. A version history tab will then be visible for selection. This will then take you to a list of all the editors and highlight the changes made by which individual on the site.



The editing of the site is to be left in the hands of only those who are chosen and authorized to do so. Do not add, or “share,” the virtual library with anyone that you do not want to have editing access. Additionally, do not send them the editable link.

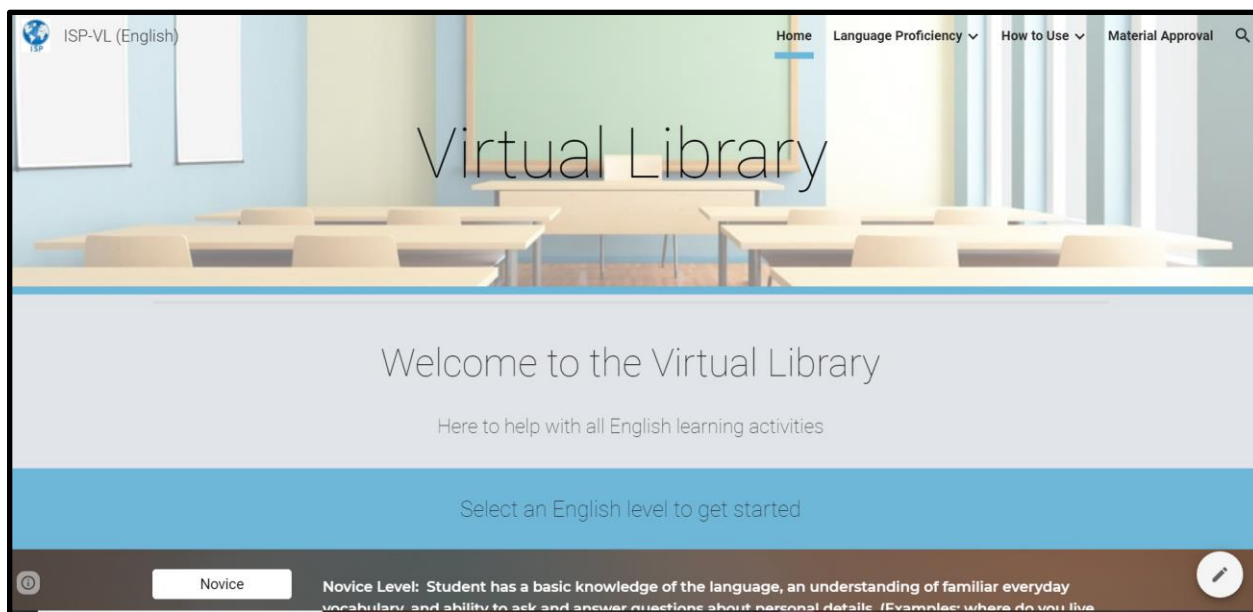
**\*If the ability to edit becomes available to too many people, the library will get into the wrong hands or into the hands of someone who doesn’t know how to properly edit the site.\***



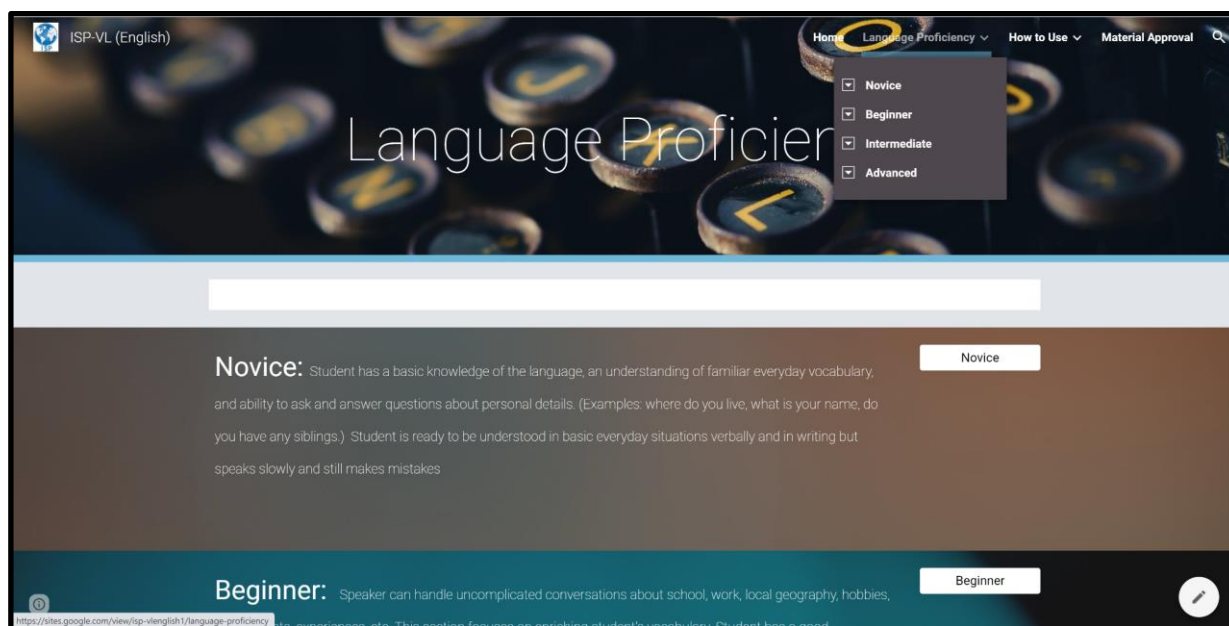
## General Information

This library has three main organizational functions that keep the material in order and easy to find. The first of these is the library display. This includes the use of drop-down tabs and different pages. Proficiency levels are used to differentiate the advancement and vigor of the material to be split up further into subjects of vocabulary, grammar, and speaking. They can then be split up further by more specific subjects. With this basic understanding of the site, it will be much easier to navigate.

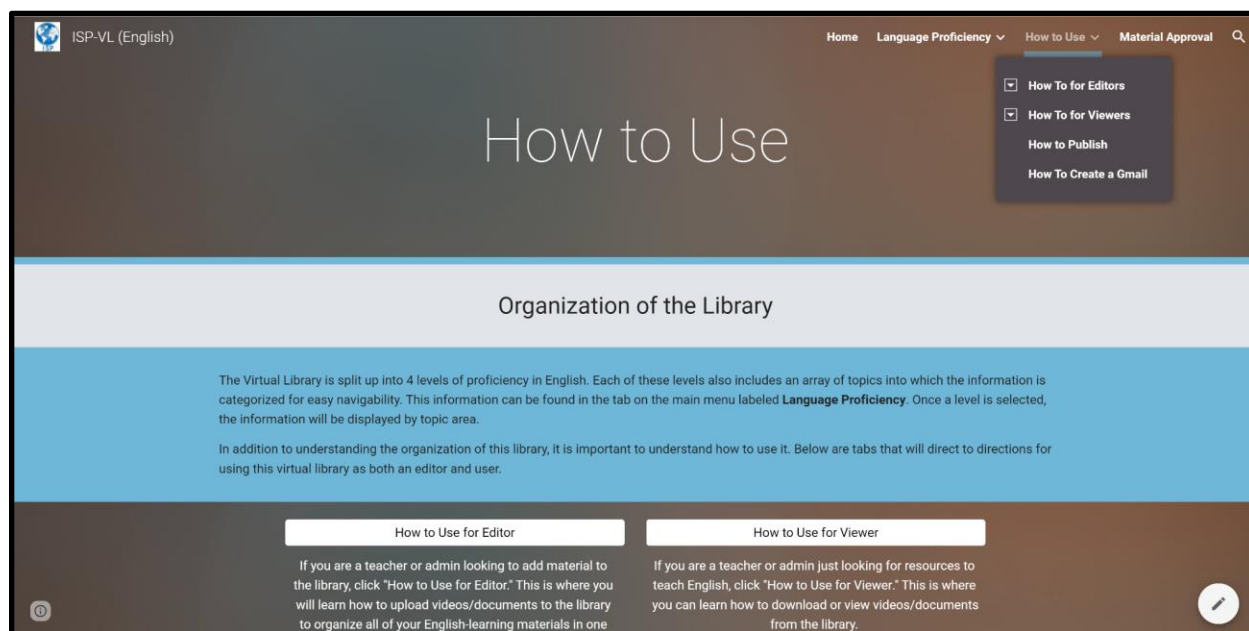
### Library Display



When first navigating to the library, it opens to the home page. This page displays our mission for improving English language teaching and contains all the important tabs in the top right. The home page tab appears first in line in the succession on the tabs on the upper right.



The next tab in the top right is language proficiency. This tab also has a drop-down with all of the proficiency levels to navigate with ease. This is where viewers will navigate to first and select their level in order to further their search for information. The breakdown of the levels will be explained in the next subsection.



Following language proficiency is the “How to Use” page. Explained in this section is how to use the site from an editor and a viewer position. It summarizes how to add and view the information in the library as well as how to publish the virtual library. There is also a tab explaining how to create a google account, which is needed for editors and librarians, but not viewers. The tutorials go through adding/viewing different kinds of media including videos, documents, and images.

ISP-VL (English) Home Language Proficiency How to Use Material Approval

# Approval for Work

Want to Upload materials into the Virtual Library?  
Fill out the form below to get approved

Formulario de Aprobación de la Biblioteca Virtual

Para que su trabajo se cargue en la biblioteca, haga que lo aprueben con este formulario

Fill out form More

Google Forms This content is neither created nor endorsed by Google.

The final tab of our site is the “Material Approval” page. This page will be specifically for the use of the librarians and will be explained in a later section of the manual.

## Proficiency Level Breakdown

The first step in navigating to the material is selecting the level. This page describes in-depth what each of the four levels represents. From here, the subjects get more specific. The descriptions of each level are described as below:

**Novice:** Student has a basic knowledge of the language, an understanding of familiar everyday vocabulary, and ability to ask and answer questions about personal details. (Examples: where do you live, what is your name, do you have any siblings.) Student is ready to be understood in basic everyday situations verbally and in writing but speaks slowly and still makes mistakes. Novice

**Beginner:** Speaker can handle uncomplicated conversations about school, work, local geography, hobbies, future events, experiences, etc. This section focuses on enriching student's vocabulary. Student has a good understanding of English grammar so they can write and understand basic notes/texts. Students may struggle with very complex literature and informative text. Beginner

**Intermediate:** Student will understand past, present, and future tenses. Student can prepare presentations, reports, argumentations, organize ideas/concepts. Student can read and understand text that are not very difficult in which they can take part in debate/discussions. However, students may struggle with interpreting irony or play on words within reading. Intermediate

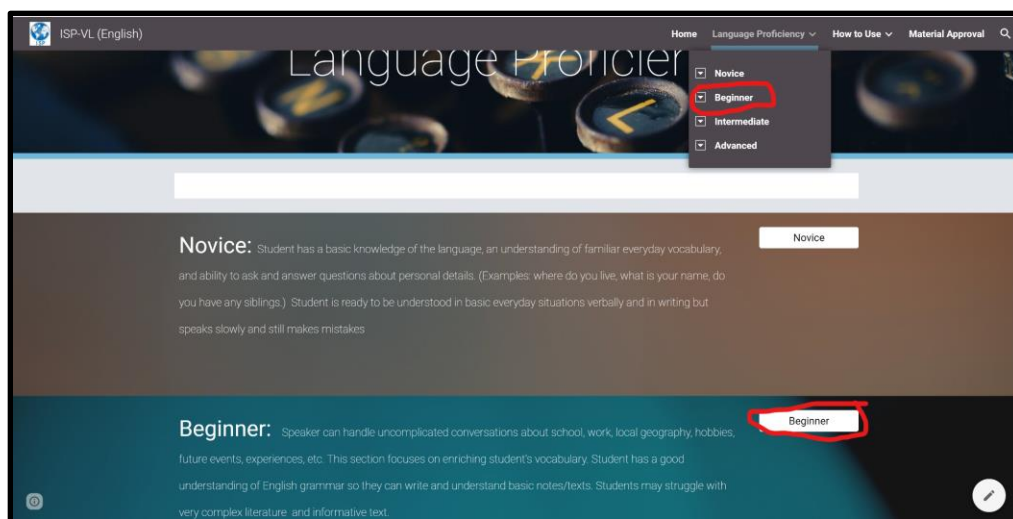
**Advanced:** Students can correct their own mistakes. Student will have coherent expression of speech along with ability to write using their knowledge. They can produce clear, well-structured text on complex subjects. Advanced

By the end of the advanced level, students should be able to:

- Read: the ability to read and understand texts written in the language
- Write: the ability to formulate written texts in the language
- Comprehend: the ability to follow and understand speech in the language
- Speak: the ability to produce speech in the language and be understood by its speakers

## Material Organization

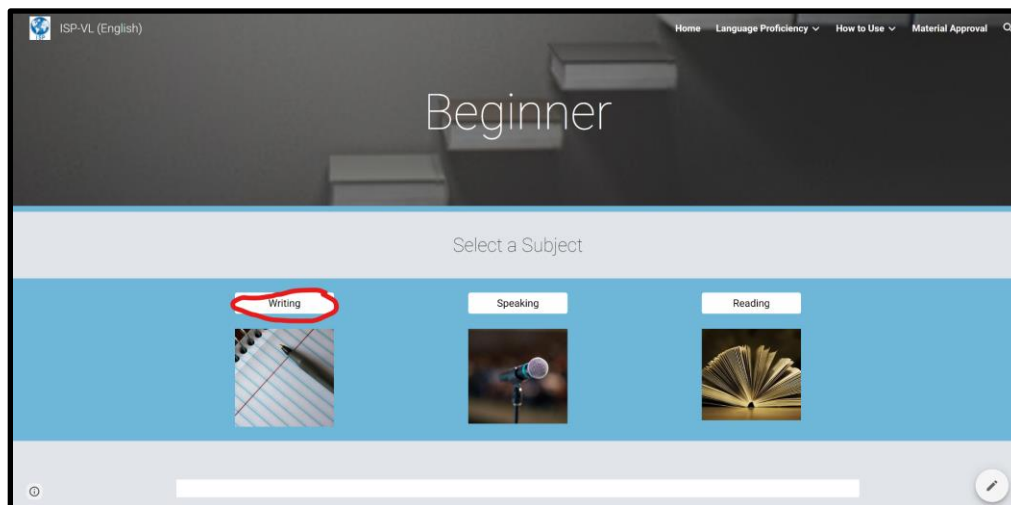
The first step in navigating to materials is selecting the level of English learning that is necessary. The specific proficiencies can be navigated to by selecting the appropriate drop down header, or the buttons, both of which are circled in red in the image below.



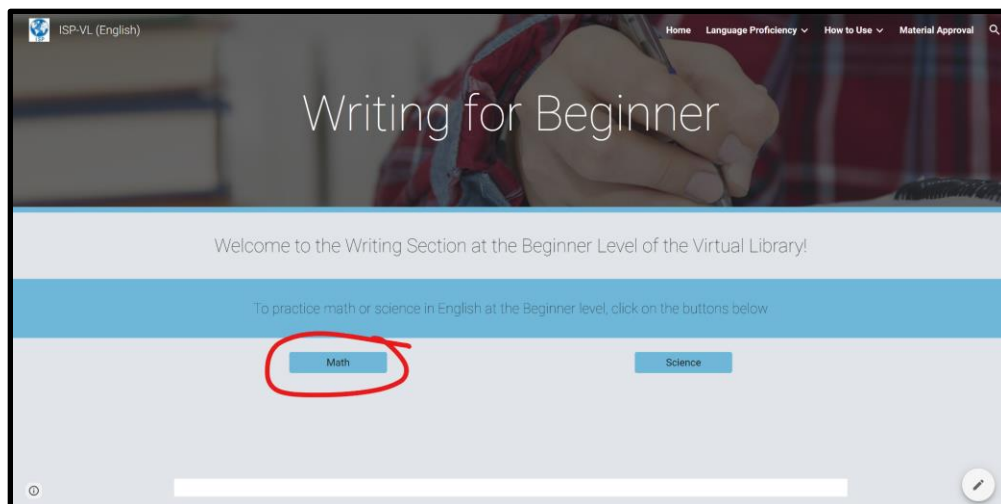
Once a language proficiency is selected, the library is further separated into the topics of vocab, grammar, and speaking. A walkthrough of the Beginner level is shown below.

Once pressing the button, the site will navigate to the appropriate level page. Here all materials are split into 3 subtopics of writing, speaking, and reading. From here, the type of material can be selected. In this image, we selected the writing topic.

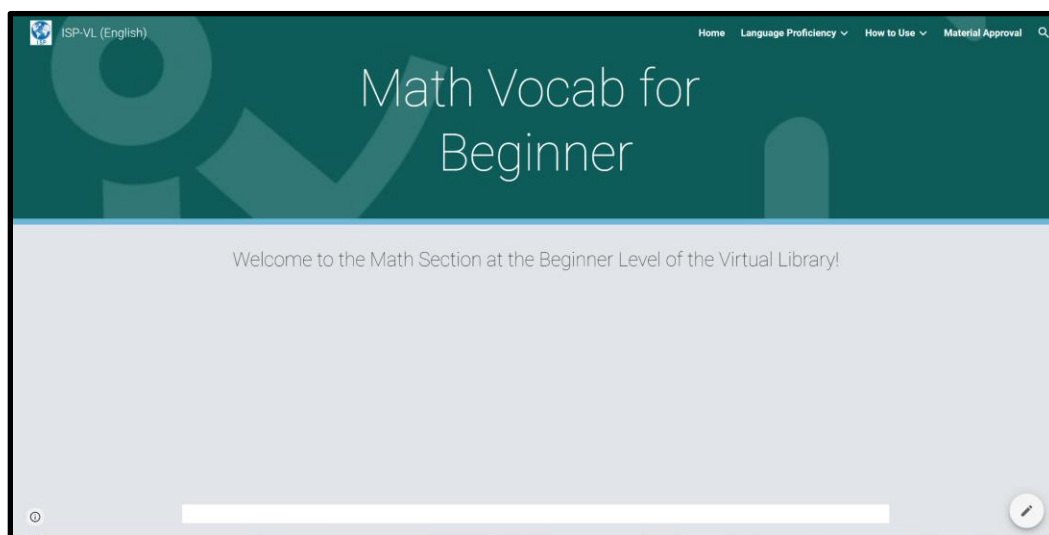
This page will then open up. Specific school subjects will be available to choose from to make the information easier to search through. You can select the subject by selecting the blue highlighted box that



it pertains to.



All material will now be displayed on this page with a proficiency level, sub topic and subject. This page will eventually display all kinds of media including documents, videos, and pictures. All material will be able to be downloaded off of the site as well.



# Editor and Their Functions

## Defined Role

Editors are the owners of the site and will keep track of all of the updating that is necessary within the virtual library. The editors are the main part of the administration of the virtual library, and editors should be limited to the people that can be entrusted with editing capabilities on the virtual library. They can insert, delete, upload, change, and do basically anything they want to the virtual library. Clearly, if editing access is allowed to the wrong people, it could have significant ramifications on the site.

Firstly, in order to be an editor, you must have a **Gmail account**.

If you are already an editor, you must fully understand your capabilities and have the correct knowledge of Google Sites before entering the site and changing it.

To be able to edit the document, the library must be shared with a gmail account. All forms will be submitted to the editors' drives in the **material approval** section. It will be their job to go through the material being submitted in that section and put it into the site and add it as necessary. Their **basic abilities** in editing the site will include changing fonts, adding titles, and creating pages, as well as adding documents and other material.

## Important Notes to Editor

Google Sites has proved to be a very valuable platform to use in the construction of this virtual library. It does however have its disadvantages especially in terms of editing controls, as it is a free-to-use resource. To keep it functioning, there are important warnings to follow. Below is a list of actions to not complete as they will hinder the use and functionality of the site:

- **DO NOT** press unpublish
- **DO NOT** delete anyone else's work
- **DO NOT** share the editable link with unauthorized personnel

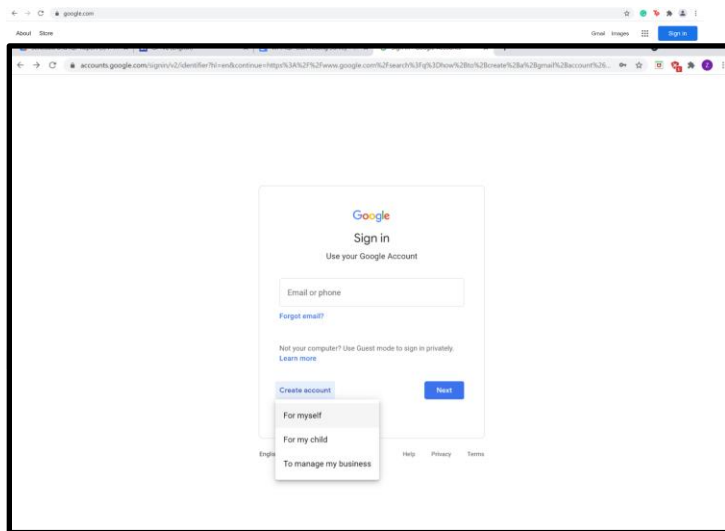
Instructions on how to heed these warnings are located in the **Important User Guidelines** section.

## How To Create a Google Account

In order to have the ability to edit, the editor must have a google account. It can work with any existing google account once pressing the link or opening the shared editable library, it will ask for a google sign-in.

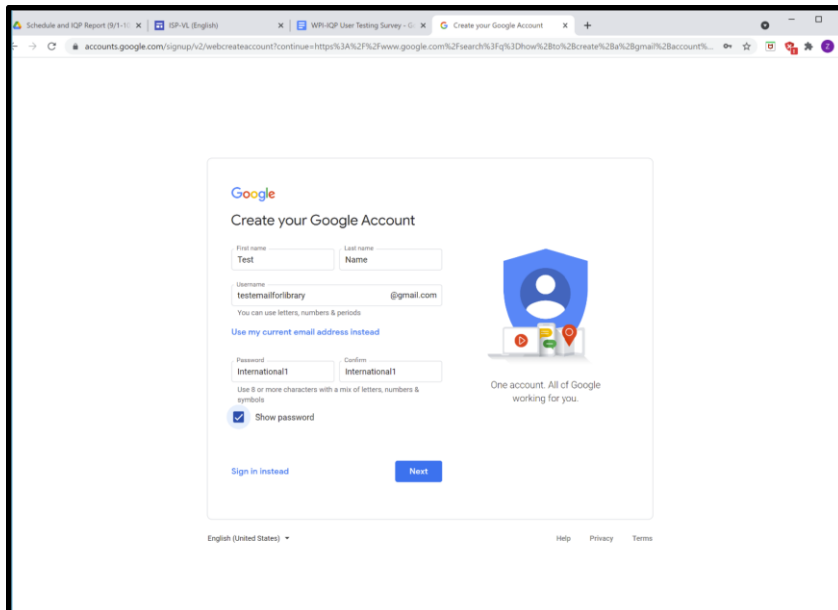
In order to create a google account, follow the steps below.

#1) Navigate to google and press the blue sign-in button in the top right-hand corner.



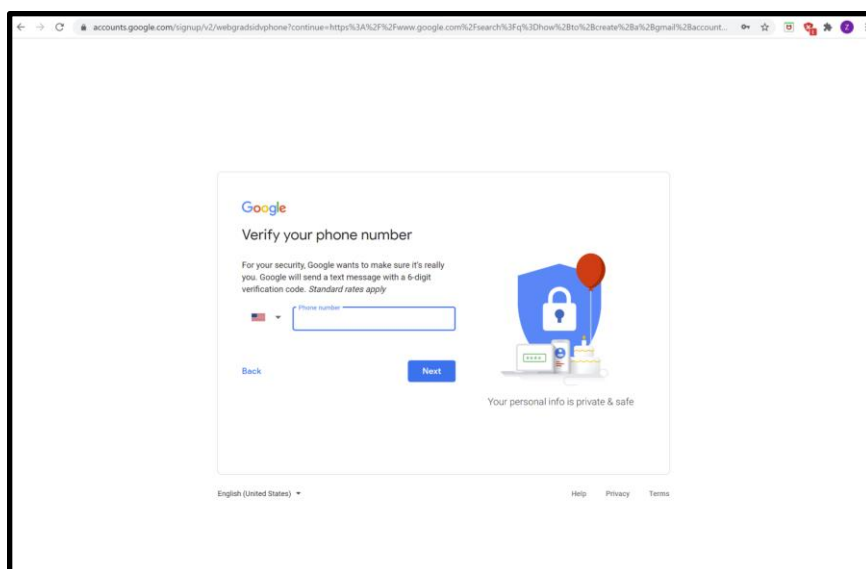
#2) Select create an account on the sign-in page.

#3) Type in name, username, and password that fit the specifications

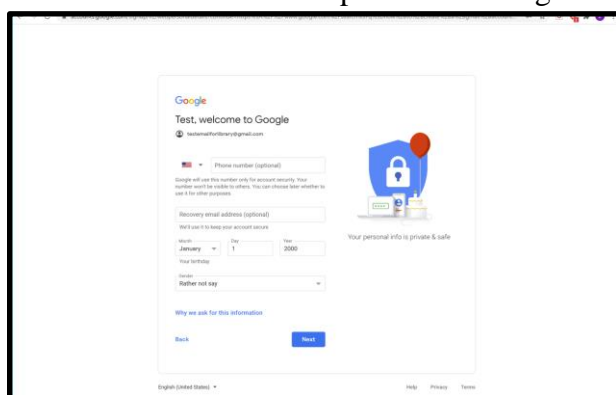


#4) Type the phone number that is accessible and used for verification. A verification code will then be sent to the phone entered after the “next” button is selected. Enter the verification code after selecting the next button.





#5) Type in birthday, identify gender, and add recovery number or email address. This will help recover the account if the password is forgotten or the owner is locked out.



The account should now be ready to use.

## Links to Become Editor

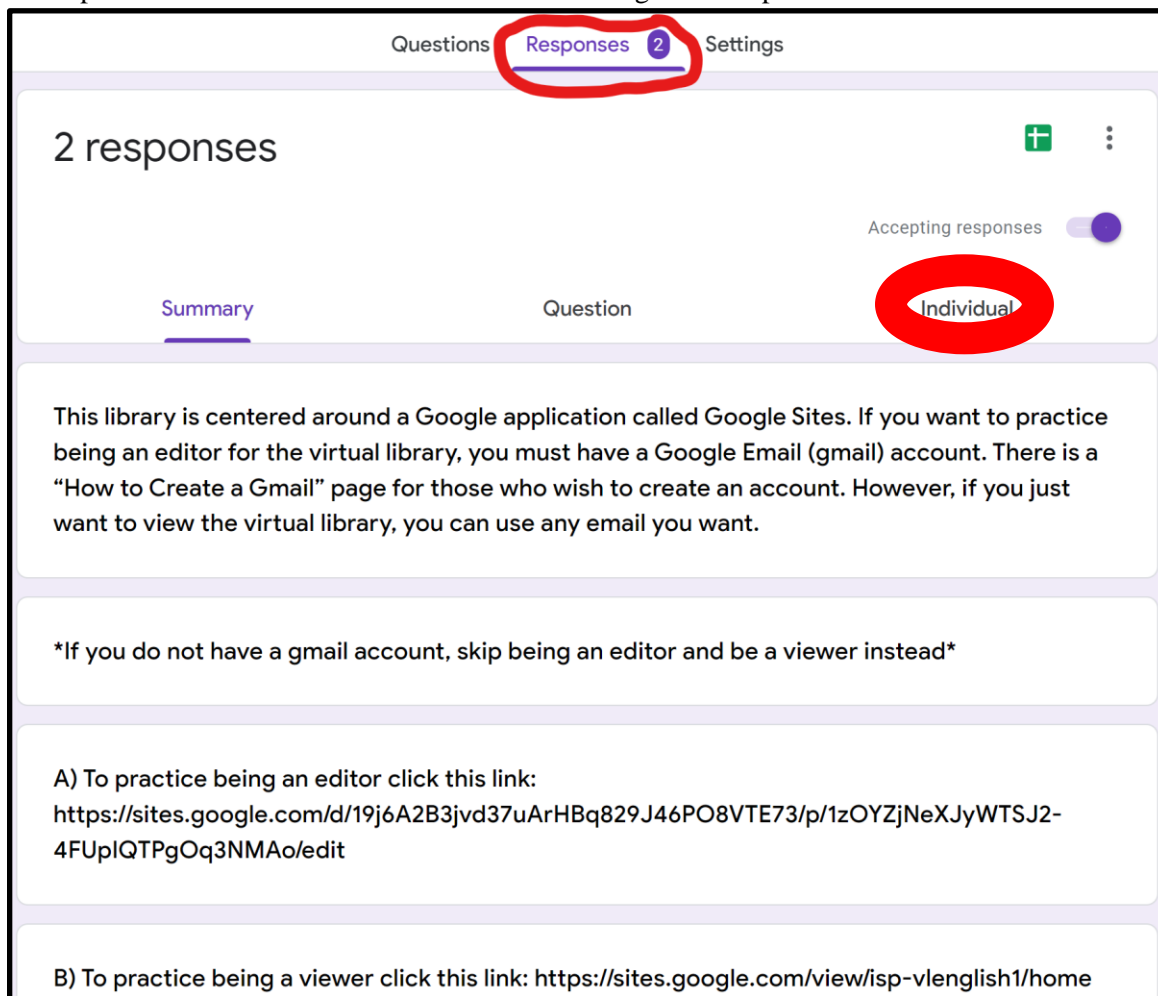
In order to become an editor, you must be given editing access or be shared with the site. In order to do this, please contact the head or an editor of the site.

After being shared with the document, you must also be included in the drive. This way you can have access to the material approval form and work to go through and add the submitted subject matter.

## Adding material

There is a range of different media that can be implemented into the library. All material suggestions will appear in the drive in the material approval form. It is up to the editors to decide if the material is acceptable for the library.

To access the form responses, navigate to the response button at the top middle of the form. Here, the responses to the survey can be displayed by summary, question, and individual. The individual response section will be the most useful in compiling the material posts as it includes all the information for a specific document. That can be selected in the right-hand option circled below.

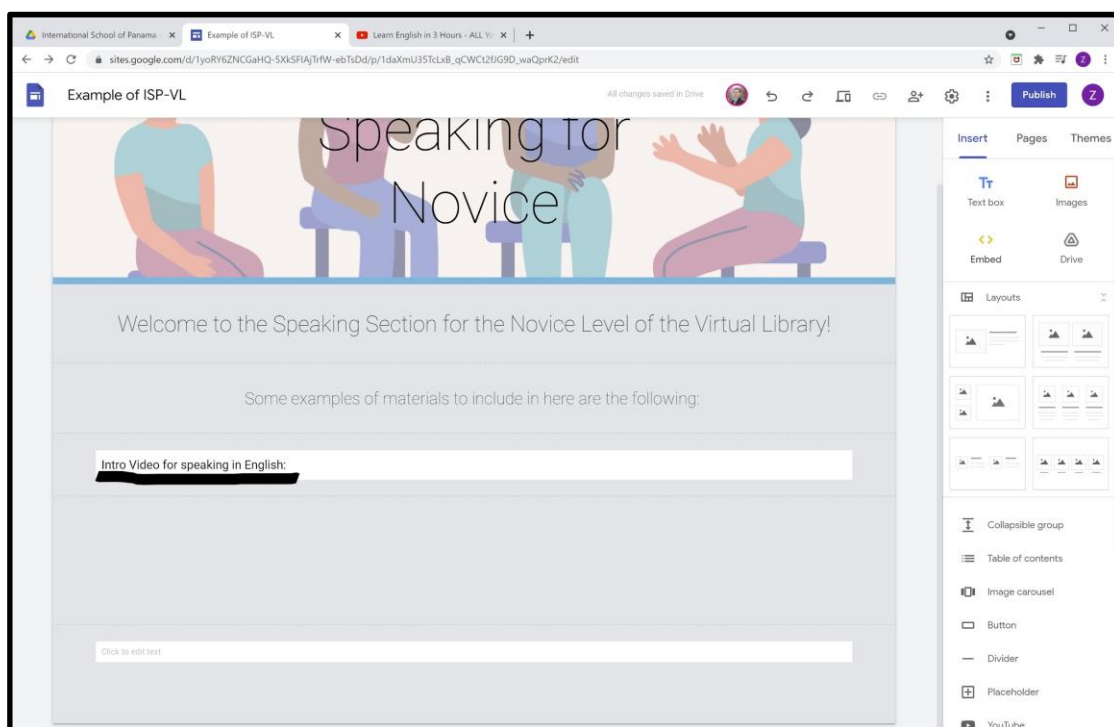
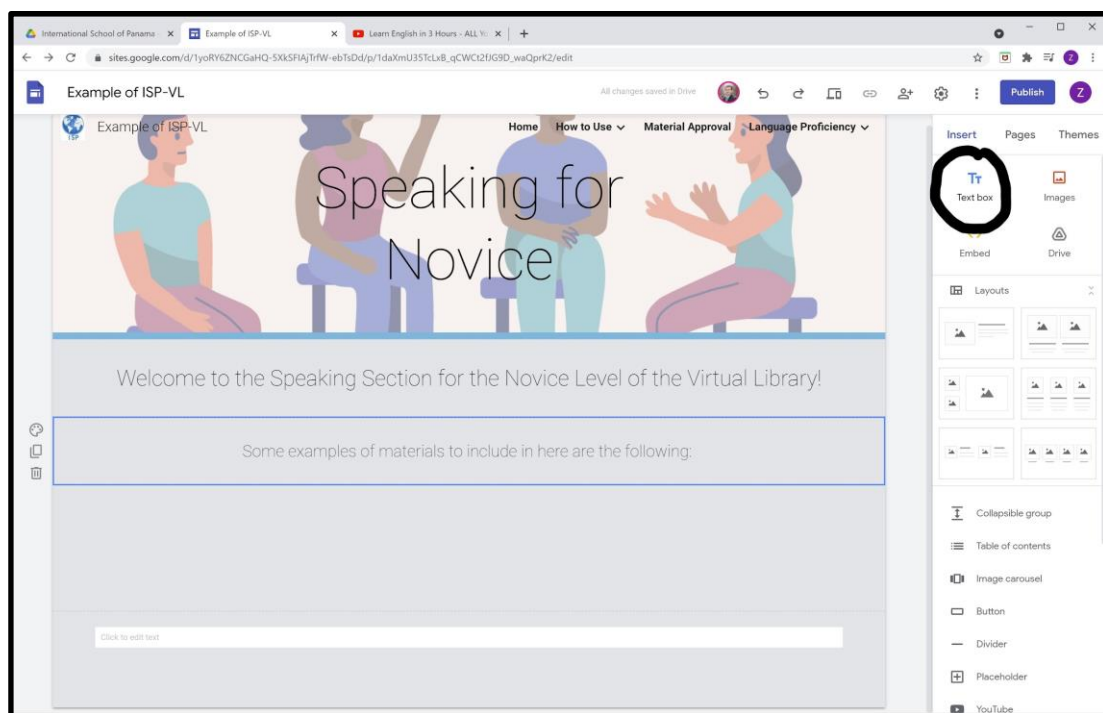


The screenshot shows the Google Forms interface with the 'Responses' tab selected at the top. Below the tab, it says '2 responses'. On the right, there is a toggle for 'Accepting responses' which is turned on. Below this, there are three tabs: 'Summary', 'Question', and 'Individual'. The 'Individual' tab is circled in red. The main content area shows a text box with the following text: 'This library is centered around a Google application called Google Sites. If you want to practice being an editor for the virtual library, you must have a Google Email (gmail) account. There is a "How to Create a Gmail" page for those who wish to create an account. However, if you just want to view the virtual library, you can use any email you want.' Below this is a note: '\*If you do not have a gmail account, skip being an editor and be a viewer instead\*'. Then there are two sections: 'A) To practice being an editor click this link: https://sites.google.com/d/19j6A2B3jvd37uArHBq829J46PO8VTE73/p/1zOYZjNeXJyWTSJ2-4FUplQTPgOq3NMAo/edit' and 'B) To practice being a viewer click this link: https://sites.google.com/view/isp-vlenglish1/home'.

When adding anything to the library, be sure to navigate to the correct section. The directions to get to the material pages are located in the **Material Organization** section under the general information. When adding any material, be sure to include captions and any other important information to help with the organization. Specific directions are located below on how to add all kinds of media.

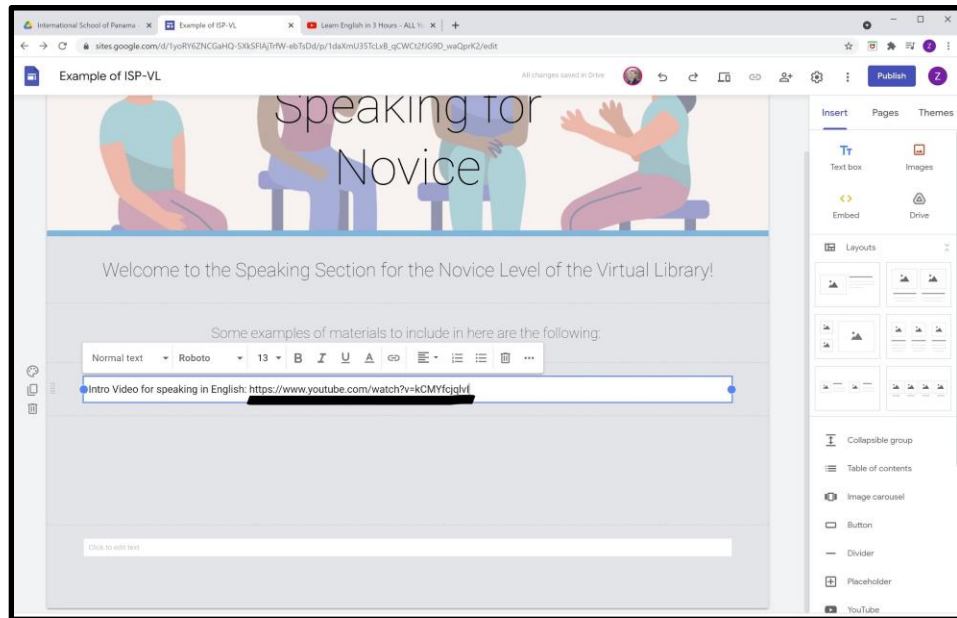
### Adding a Caption

For Creating a caption: Click the "Text box" feature under the "Insert" tab and enter a caption for what you wish to upload

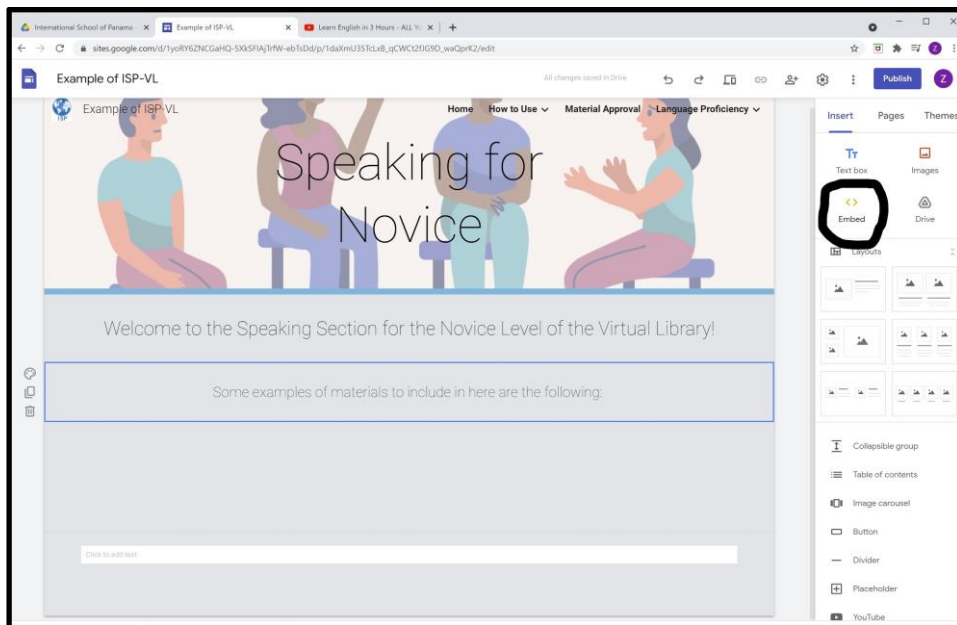


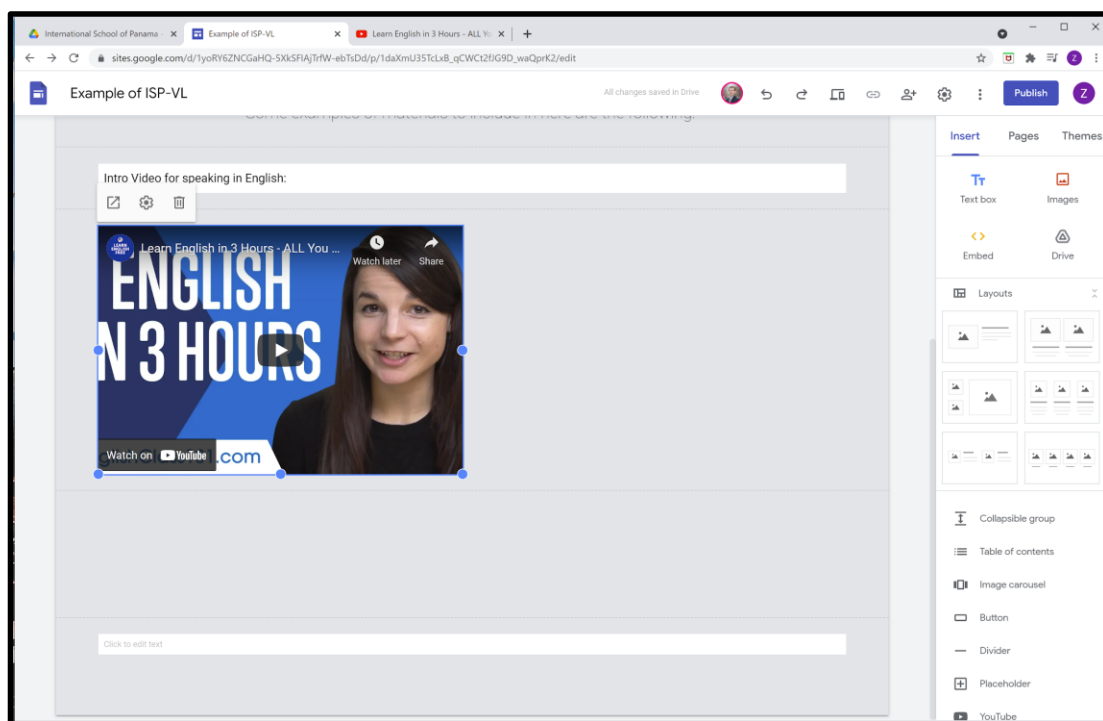
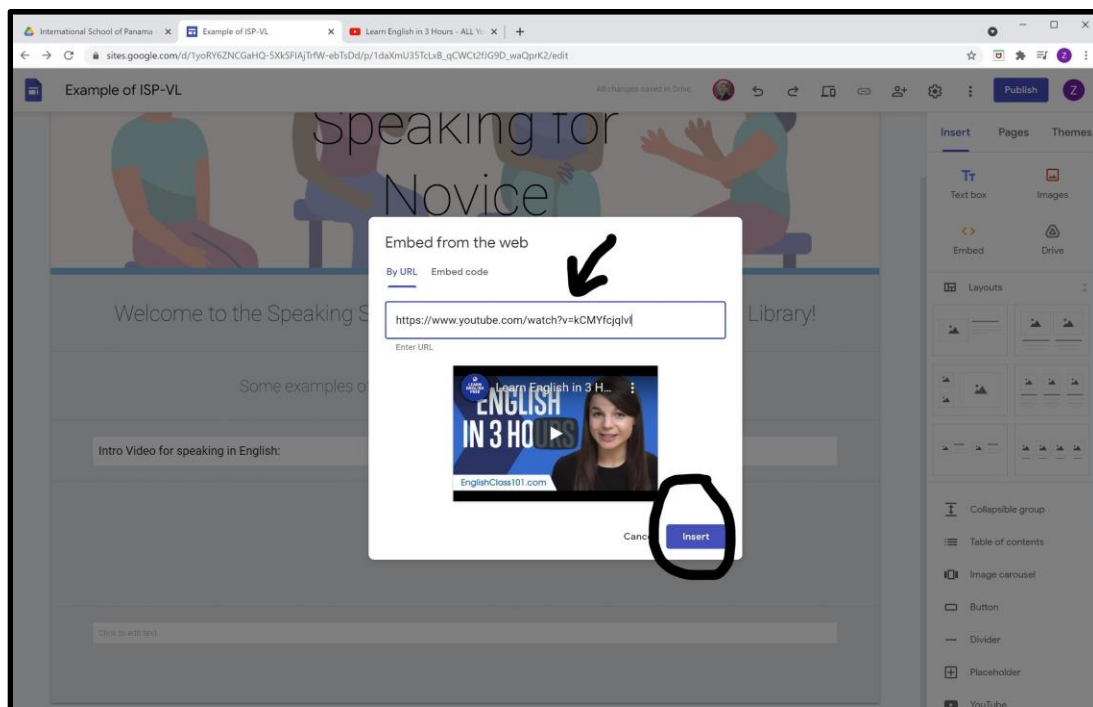
## Adding Videos

1. Once a caption is created for your desired material, you could always copy and paste the link in the text box

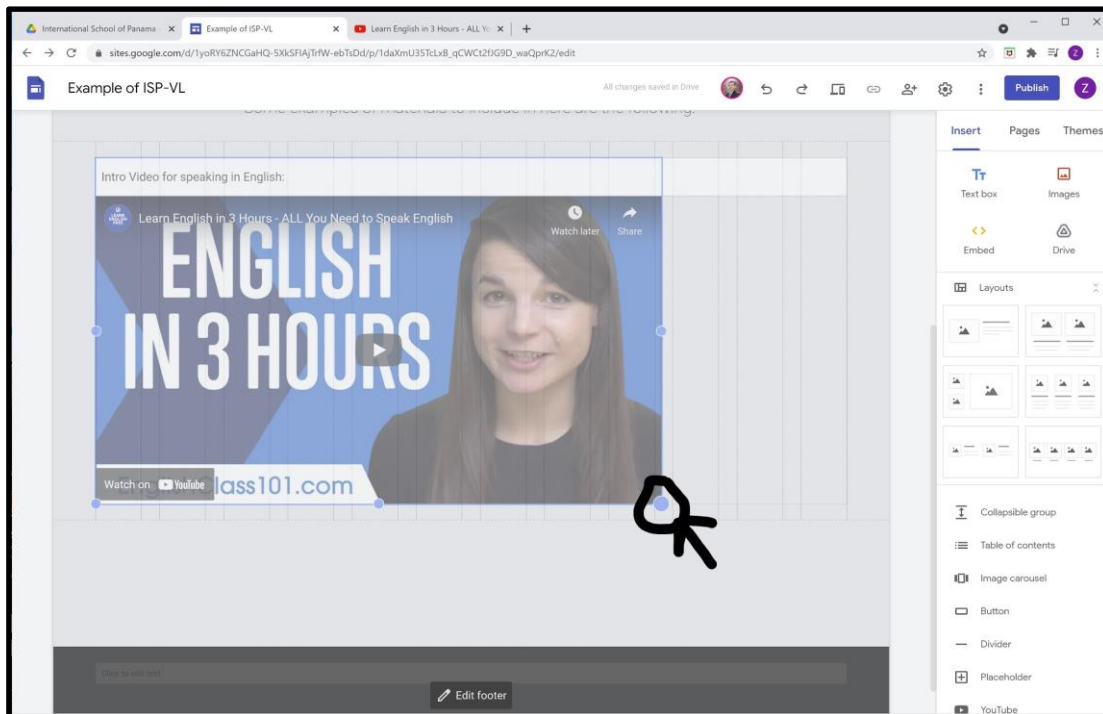
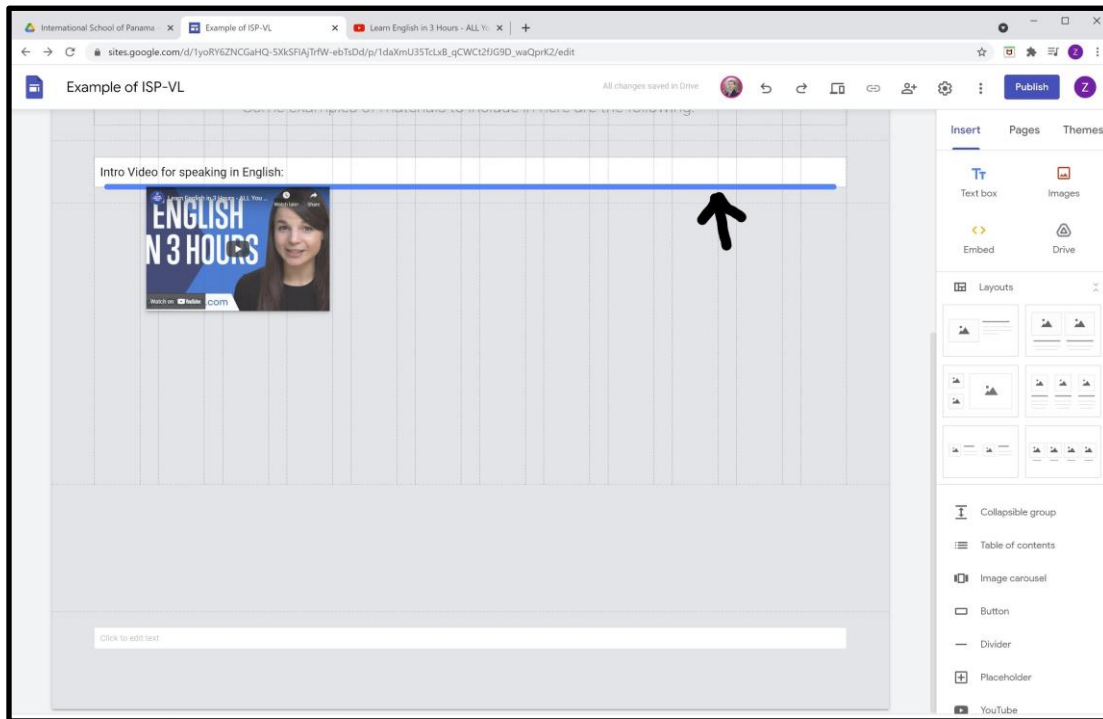


2. Click on the "Embed" feature under the "Insert" tab. Copy and paste the link you wish to upload. Once you select "insert", the video will appear on the page

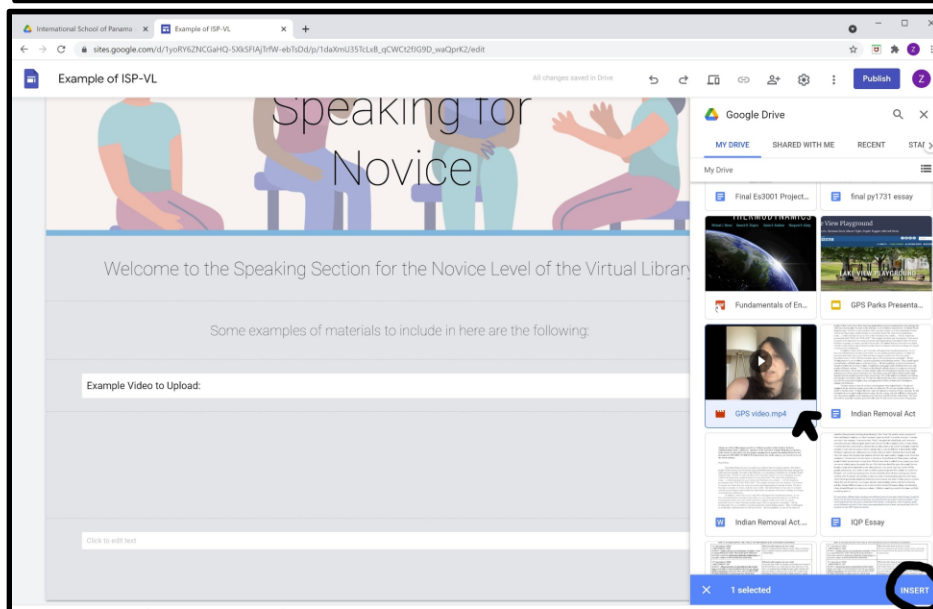
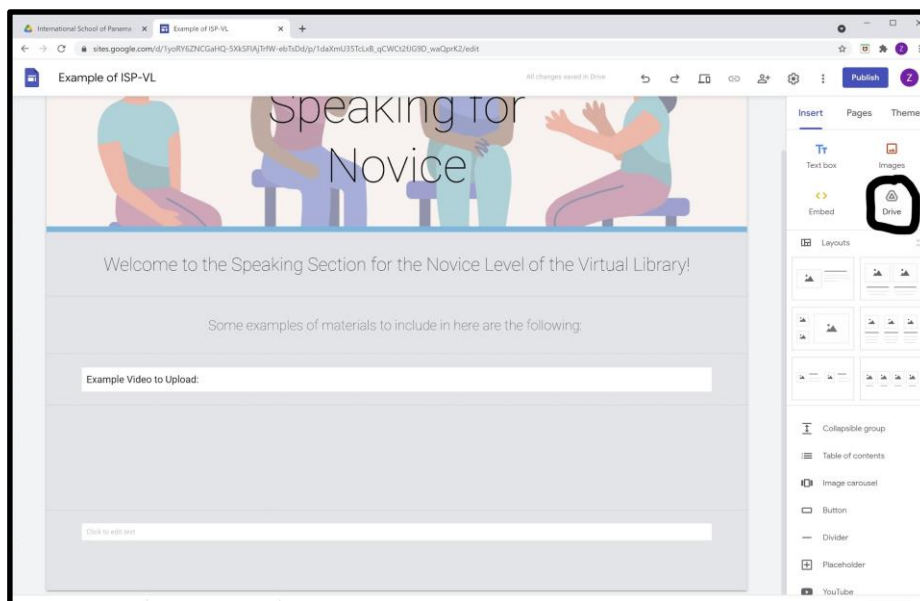




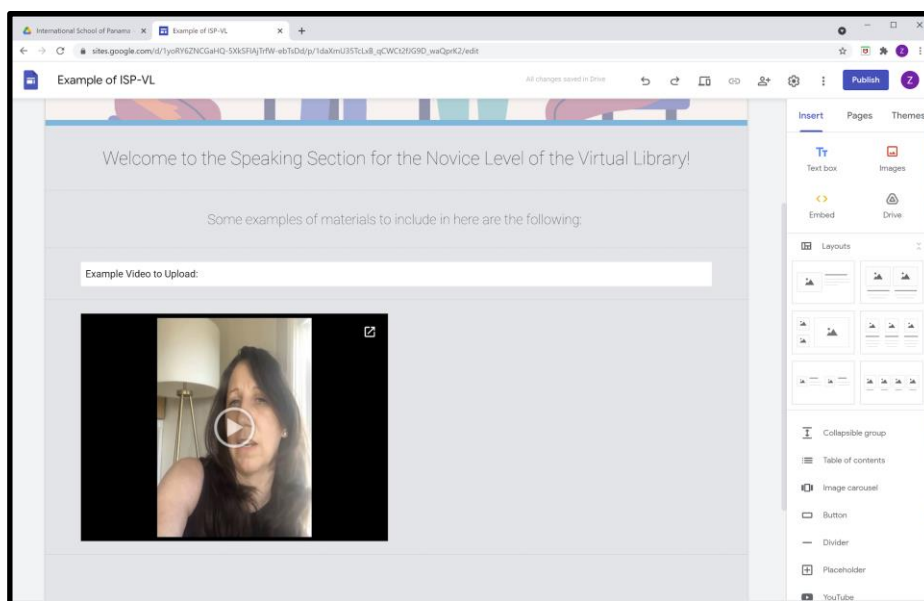
3. You can also embed the video with the caption by dragging it, and placing it where you see the blue highlight (which could either be above or below the caption). You can also shrink the video to size by clicking on the blue dot in the corner when it is highlighted and dragging it.



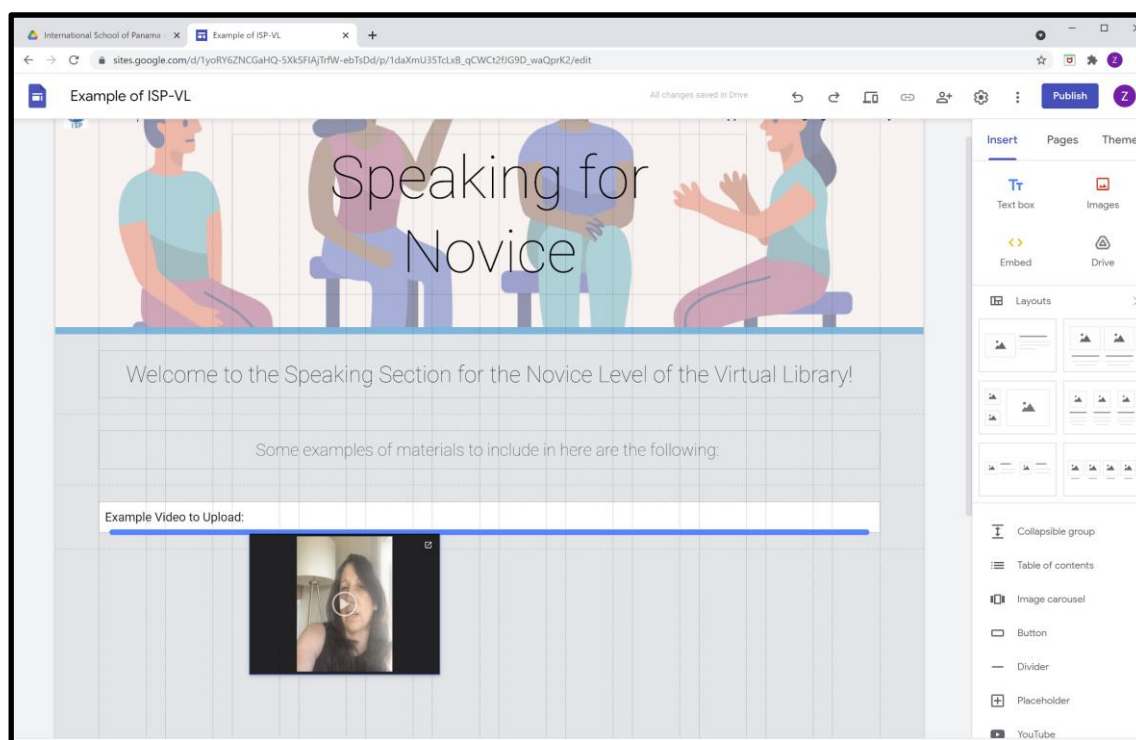
4. If the video is something that was recorded on a phone, computer, or laptop, you can click on "Drive" under the "Insert" tab, and select the video you wish to upload. Once you click on "insert" the video will appear in the Library







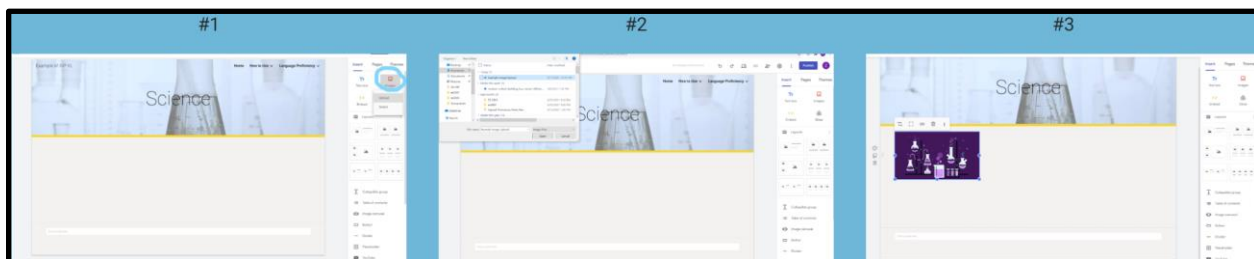
5. You can also embed this kind of video with the caption by dragging it, and placing it where you see the blue highlight (which could either be above or below the caption).



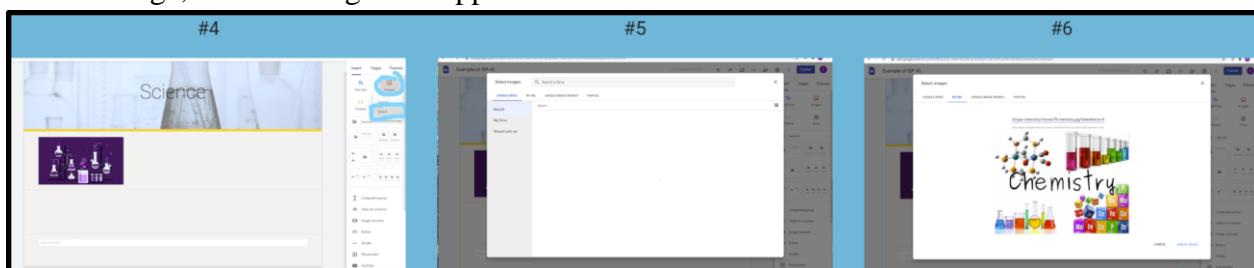


## Adding Photos

1. To insert a photo onto the Virtual Library, Select the "Images" button under the "Insert" tab
2. To upload a image from your laptop or computer, select "Upload"
3. Select the image from your laptop/computer that you wish to upload, and it will appear on the site



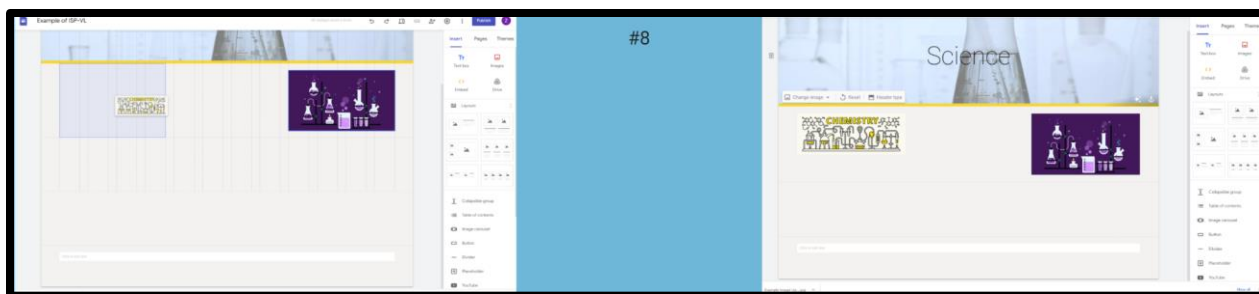
4. To upload an image from google, select "Select Image"
5. If you have an image within your google drive, click "Google Drive". Select an image, then "Insert Image". Image will appear
6. If you have a link address of a picture, select "By URL". Copy and paste link, click Insert image, and the image will appear



7. If you want to search on google for an image, select "Google Image Search". Select the image, click Insert image, and the image will appear

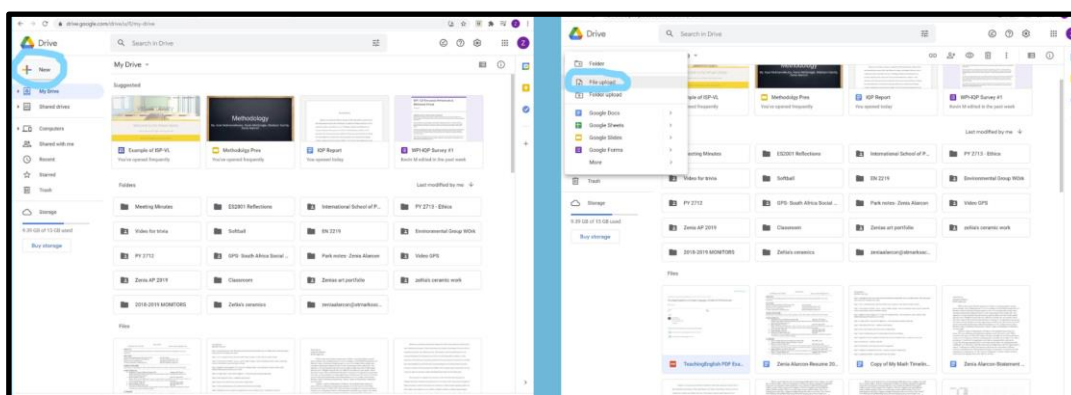


8. If you want to move the image, select the image and drag

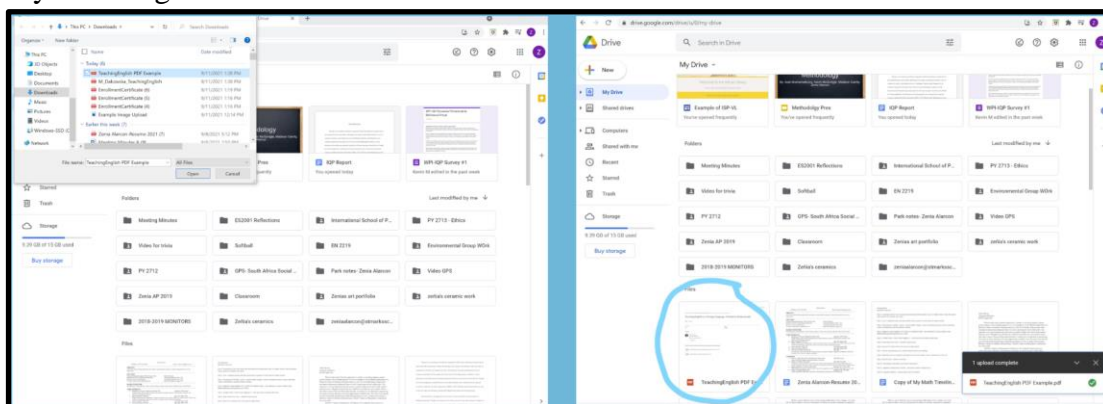


## Adding Documents

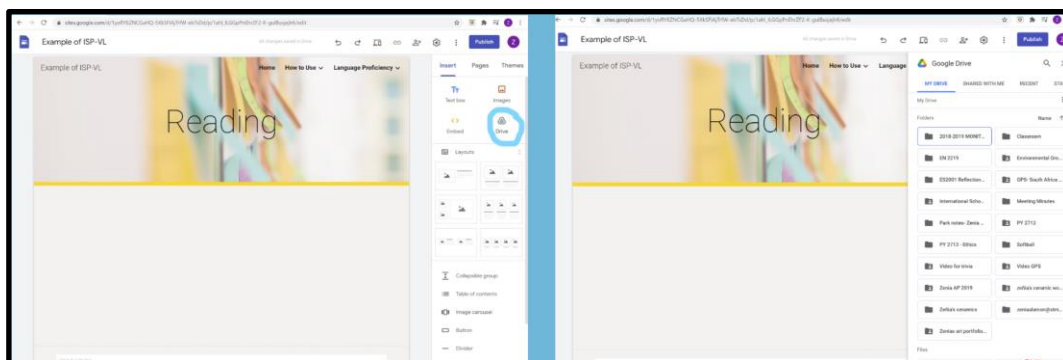
1. To upload a PDF or a Microsoft Word Document from you laptop/computer, open google drive and select new.



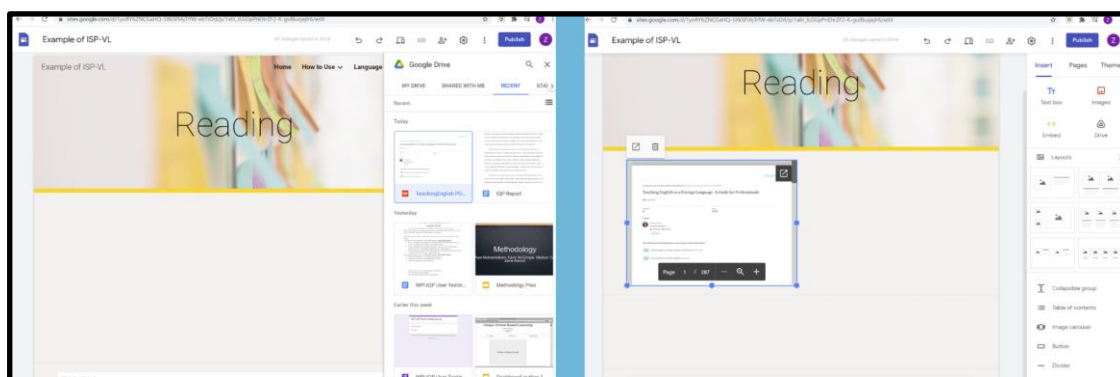
2. Click file upload and select the pdf you wish to download. Now the PDF should be in your Google Drive



3. Go to the virtual library, and select Drive under the Insert tab



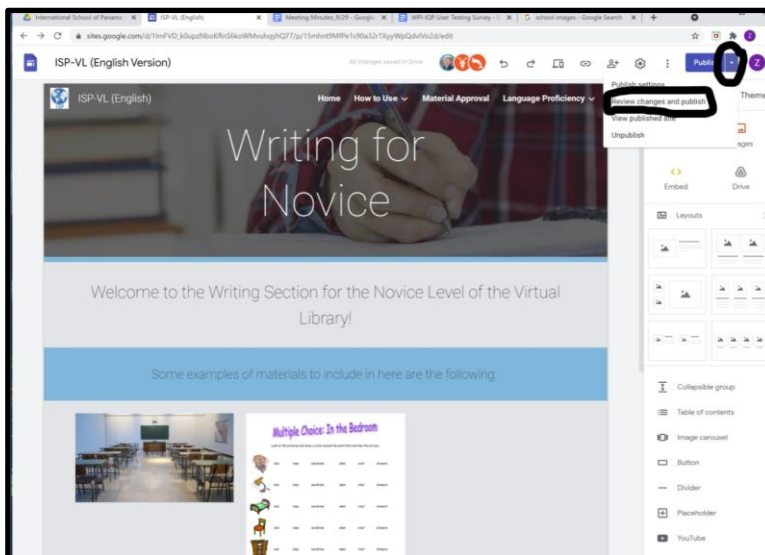
4. Select the PDF that you wish to upload, and click insert. Now the PDF should be on the site.



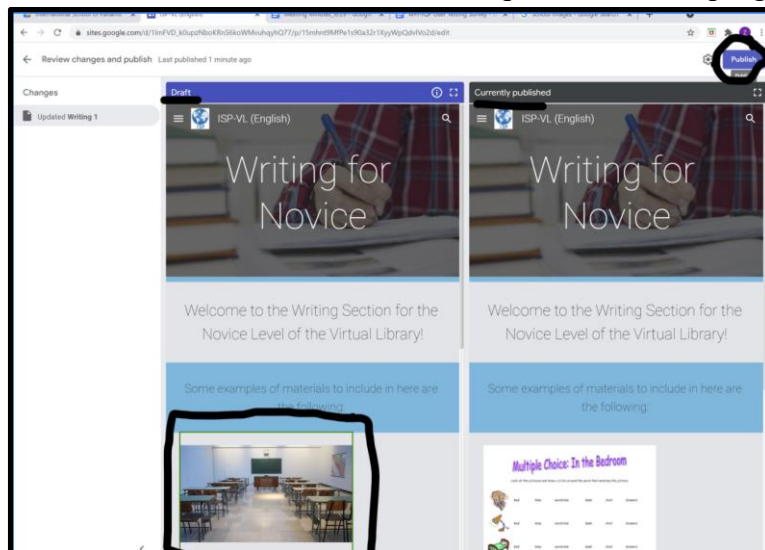
## Publishing

After adding material to the library or making any edits, the published site will not display the changes seen on the editable link version. In order for the said changes to appear to the public viewers, the edits must be published. This publishing step must be included after all the above adding material directions.

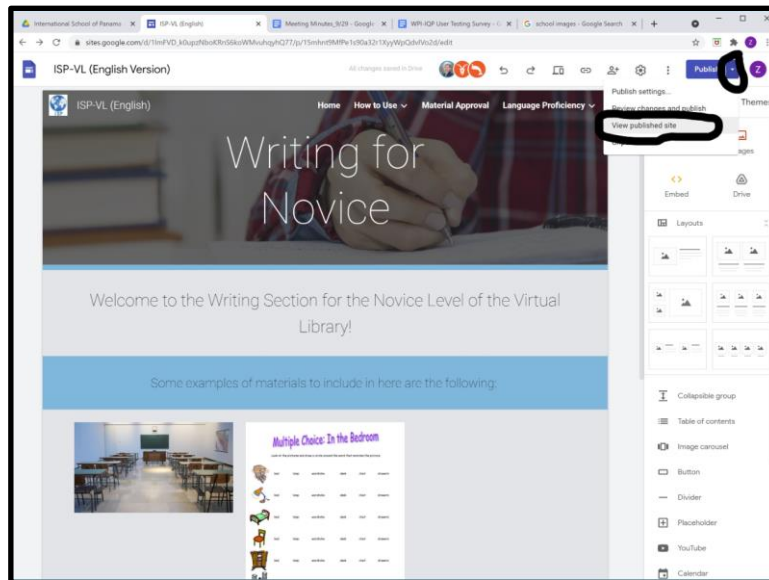
1. Once you have uploaded everything wanted, click the drop-down next to publish and select “Review changes and publish”



2. Review what was edited under “Draft” and select publish at the top right corner



- To view your published work, select the drop down next to publish and select “View Published Site”



## Custodial Functions

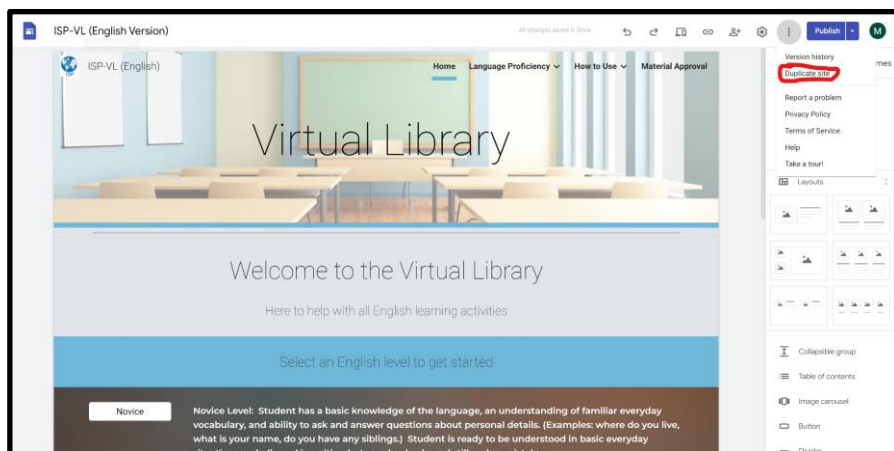
These responsibilities deal specifically with the functionality of the site. This includes managing backups, monitoring damage control to any issues that arise, and assessing any formatting problems. Certain editors will be given these responsibilities to keep the library operating at a high level.

## Backups

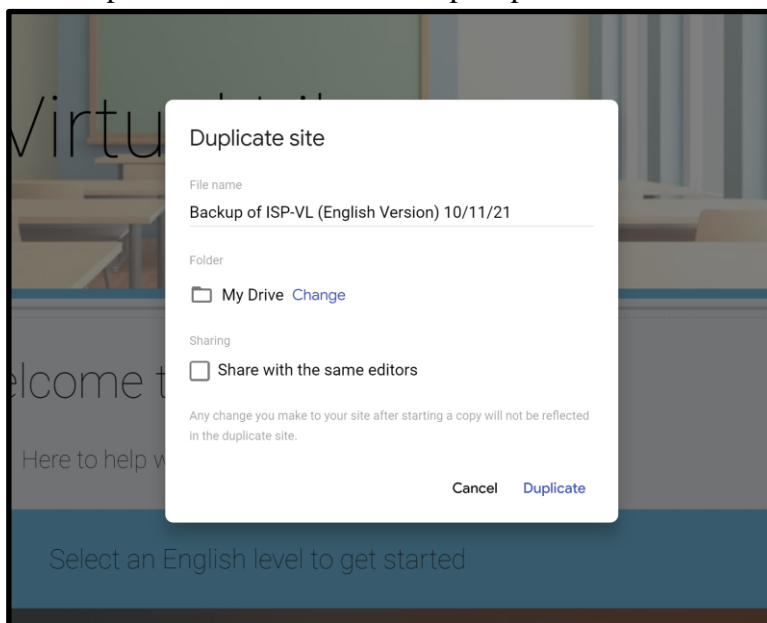
There will always be two versions of the library, one published and one not. These will be referenced as the backup and the published version. The published version is accessible to edit for all editors and is available to all viewers. The backup is an unpublished copy of the site that is only available to the editors who are selected to have custodial responsibilities. A new backup copy will be created every few weeks or when scheduled by the editors to save changes made in the weeks between. More frequent copying will make the backup more up-to-date. The backup is to be kept in case something is to happen to the published site or a reference is called for to the previous functioning site.

In order to create the backups, follow the steps below.

- #1) Press the three dots in the upper right-hand corner. In the drop-down menu select “Duplicate Site” that is circled below.



#2) Rename the duplicate “Backup of ... “ with the date made at the end. This version should also only be shared with other custodians/ custodian folders and not all of the same editors as the published version. Do not publish or edit this site. Repeat process as scheduled.



## Layout Checks

While information is added to the library, the format is crucial to its understanding and easy navigation. To ensure this layout remains intact, there must be various eyes on the site to search for issues in the information display.

The main focuses of a layout check are:

- Check duplication of pages and material
- Correct document location
- Proper captions and description
- Deletion of general library display pages

If any issues regarding these topics are found, changes are to be implemented to get the site in order once again. This responsibility also covers filtering complaints and questions about the site from users and altering the library as they see fit.

## Site Recovery

In case of emergency or library malfunction, the backup can be used to modify the published site. The backup can be used to either replace the published version indefinitely or be used to modify the published version. In order to follow through with establishing and publishing the backup, it is important to remember that if the backup is to replace the published version indefinitely, a new link must be shared with all users of the site. It is easiest operationally to use the backup just to modify the published to avoid the issues that arise with establishing a new site.

If an emergency case does arise where the backup site needs to be made into the main library, follow these steps:

- Unpublish the published site (this is the only case that allows the site to be unpublished).
- Duplicate the backup site and name it the old published version of the library's name.
- Share the new library with editors.
- Publish the site.
- Share the new link with all schools and avid users of the site.

# Librarian and Related Functions

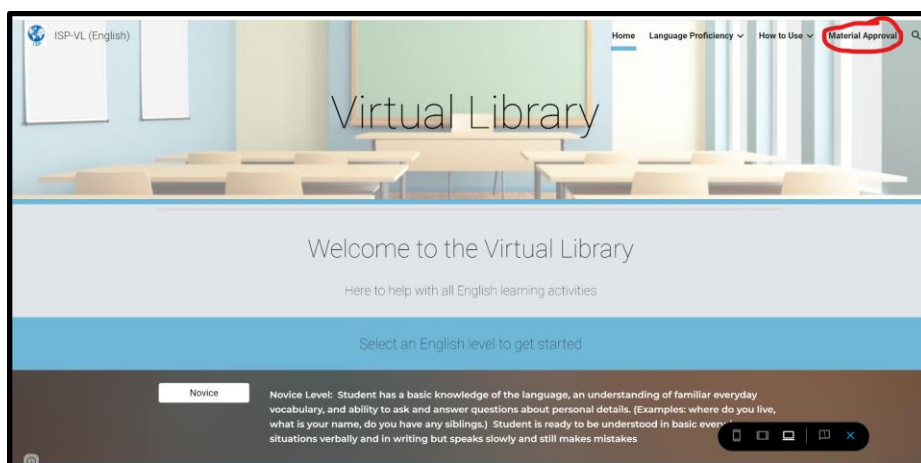
## Defined Role

These will be the interactive viewers of the site. This role is in reference to the teachers and other users who have material that is relevant and submit forms to the site. Any viewer will have access to this form.

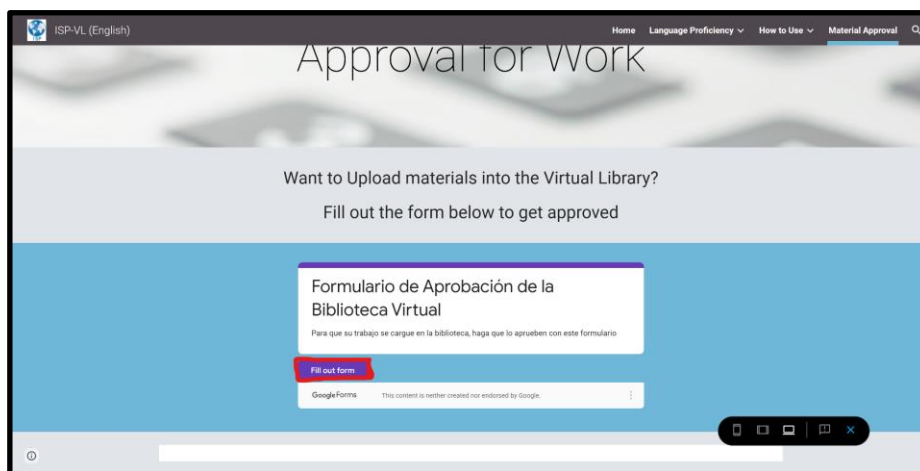
## Filling out form

The form should be filled out with all necessary information for material additions.

1. Select “Material Approval” tab in top right corner.

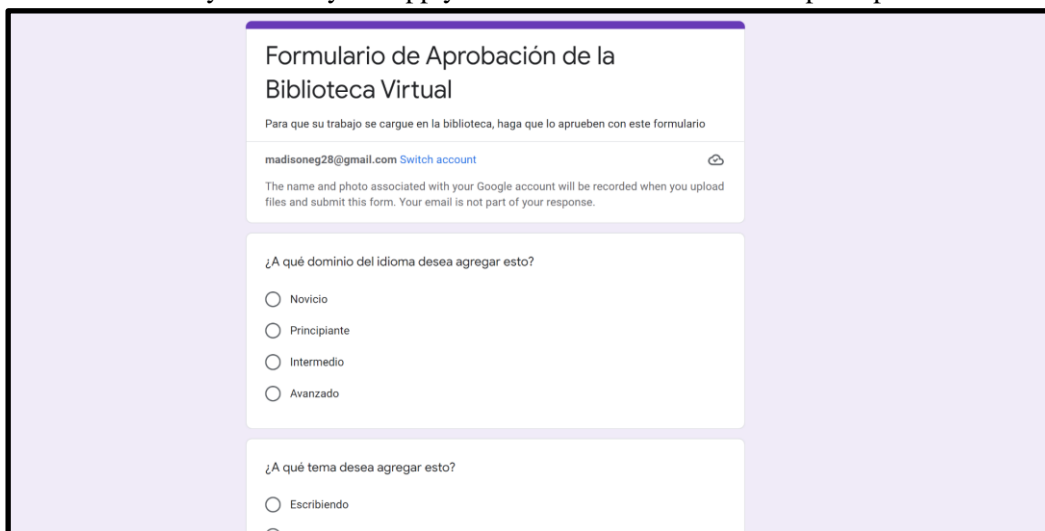


2. Click on “Fill out Form” circled below





3. You will then be taken to this google form. None of the questions are mandatory to answer, but fill to the best of your ability to supply material with the most description possible.



The screenshot shows a Google Form titled "Formulario de Aprobación de la Biblioteca Virtual". Below the title, there is a subtitle: "Para que su trabajo se cargue en la biblioteca, haga que lo aprueben con este formulario". The form is associated with the email "madison28@gmail.com" and includes a "Switch account" link. A disclaimer states: "The name and photo associated with your Google account will be recorded when you upload files and submit this form. Your email is not part of your response." The first question is "¿A qué dominio del idioma desea agregar esto?" with four radio button options: "Novicio", "Principiante", "Intermedio", and "Avanzado". The second question is "¿A qué tema desea agregar esto?" with two radio button options: "Escribiendo" and "Traduciendo".

**Formulario de Aprobación de la Biblioteca Virtual**

Para que su trabajo se cargue en la biblioteca, haga que lo aprueben con este formulario

madison28@gmail.com [Switch account](#)

The name and photo associated with your Google account will be recorded when you upload files and submit this form. Your email is not part of your response.

¿A qué dominio del idioma desea agregar esto?

☐ Novicio

☐ Principiante

☐ Intermedio

☐ Avanzado

¿A qué tema desea agregar esto?

☐ Escribiendo

☐ Traduciendo

## Viewer and Related Functions

### Defined Role

This will be composed of those who use the library as a search tool and library. They will have no impact on what is on the site or how it's run but take advantage of what it has to offer. Consult the **General Information** section of the manual to understand the layout and how to navigate the library.

### Questions or difficulties

If there are any issues that arise with the site or in any details, contact the owner or editor of the site through email.