UNIVERSITY OF EL SALVADOR

SCHOOL OF ARTS AND SOCIAL SCIENCES

DEPARTMENT OF FOREIGN LANGUAGE

TOPIC:

"Limitations of Systems Engineering Students due to the absence of English in their curriculum at the University of El Salvador, semester II, 2019".

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ABSTRACT

Authorities from the school of systems engineering are trying to help students with the knowledge of the English language by means of free courses because the academic load of Systems engineering students does not include English courses for any year. As teachers and students know that this language is important even from the first year of the major so students have to know or to train themselves in the learning of this language to cope with the lack of English language during the major.

On these grounds, the focus of this study is to identify those limitations that interfere during the learning process of students from System Engineering at the University of El Salvador due to the absence of the English language in the year 2019. It is believed that difficulties are found because of the use of technology, software, computers, etc. that require not only Spanish but more English language.

The collection of data of this study was taken by means of questionnaires from two systems engineering student groups and by means of interviews to some authorities of that major during semester II, 2019. The results of this research were gotten by means of a mixed method and inductive research because it was planned to generalize at the end the results found to the problem in question.

Keywords: the absence of English language, limitations of systems engineering students, the lack of English language.

INTRODUCTION

The present document refers to the limitations that students from system engineering have in the learning process due to the absence of English in their curriculum. It is known that in this area, engineering, the English language has a strong relation because software has a lot to do with it. So that, this project is intended to find those students' limitations to establish a degree of importance of this language in the educational process of this school. As a matter of fact, one important aspect of studying engineering is that students of this major might face a vast of information written or made in English as well as in Spanish, information that might be helpful to acquire knowledge and improve abilities. For example: There are hundreds of study tools for engineering students in English as books, videos, instructions on internet, reports, articles, the use of software packages, and many more things that can be utilized by the learners. Under those circumstances, if the future engineers don't know English, it would be harder for them to understand the topic; on the contrary, if they are familiar with this universal language, English, it would be easier not only for the students to acquire knowledge but also for the teacher to share knowledge. That was the reason why this investigation took place to identify limitations that interfere during the learning process faced by students from System Engineering at the University of El Salvador due to the absence of the English language. This was to set a precedent with argumentation of the importance of knowing English, especially in this major.

This research consists of a justification, a short literature review, a statement of the problem, objectives, research questions, a methodology and a delimitation of the problem as well as a chronology of the research. To take an interest in this topic, it was necessary to know how the program in this school was formed. Besides, literature about importance of English for engineering was analyzed, as well as the education in other parts of the world for system engineering. Likewise, programs from other local universities were compared.

To run this research a mixed qualitative-quantitative method was followed. Furthermore, the approach taken was an inducted research because the limitations found were generalized to most students. Regarding the limitations of this study the time for the research was during the year 2019 and the place was at the School of Engineering at the University of El Salvador. Only students' limitations in the learning process, the subjects where material in English is related to this major and the level of English needed is mainly what researchers were interested in this study project.

STATEMENT OF THE PROBLEM

To what extent the absence of English in the curriculum of Systems Engineering Major provokes hard situations for students like: To pass some subjects with good grades, to understand important information related to the major and to turn in homework and assignments.

Learning a second language continuous being very useful nowadays. Many students find necessary to have, at least, a basic knowledge of the English language. Therefore, Basic English ought to be part of any major at the University of El Salvador to help students in the process of learning and searching any English information around them. Furthermore, Systems engineering is closely related to technology and most of the instructions in technology come into English; then, it should be a must for engineering students to understand English in this area to have a good grasp of it.

But in our University there seems that some majors have not considered the importance of this language and this is the case of Systems engineering major which does not incorporate English in its academic plan. English becomes important for engineering students because they must learn a complete use of technology that is too complex, a vast of books are written in English, information associated to some subjects and assignments require a knowledge of English. It is unknown the way students who don't not know English have to deal with this situation during their learning process.

In fact, that is why extensive research on this was needed to identify the different problems students of this major are facing in their learning process by means of observation, analysis, surveys, and interviews. Additionally, to discover the degree of the importance English has; also, to state reasons for considering English as part of the curriculum of this bachelor's degree. As well, this investigation can help to determine when problems start to help students at that point so they can cope with this problem more relaxed than they do now.

DELIMITATION

This research project was divided according to the following delimitations:

Time: The research was developed from February to December 2019.

Place: The project took place at the School of Systems Engineering

Scope: It was to identify the limitations that System Engineering Students face due to the absence of the English language, the subjects where material in English is needed and to value the level of English required in this major.

OBJECTIVES

General objective

To identify limitations that interfere during the learning process being faced by students from System Engineering at the University of El Salvador due to the absence of the English language through interviews and surveys.

Specific objectives

1. To discover in what subjects students have to deal with materials in English.

2. To recognize when System Engineering students start to have problems due to the absence of the English language in the major.

3. To evaluate what level of English students need to face with in subjects where English is needed.

4. To find out what students express about the inclusion of the English language as part of their study plan.

5. To describe what System Engineering students do to manage the material in English they found in the major.

RESEARCH QUESTIONS

1 – What problems do Systems engineering students face when they study this major having the absence of English?

SUBQUESTIONS

a) - In which subjects are students required to use English for academic activities?

b) – At what level in the major is the use of English for Systems Engineering students more demanded?

c) - What level of English do students of System Engineering need to deal with their academic requirements?

d) - What are the thoughts among students about the absence of English in this major?

e) - How do students manage the situation when the knowledge of English is necessary, and more competence is needed?

JUSTIFICATION

English language has been for many years an important instrument that students from many majors have been using to improve their knowledge, increase their skills and experience in any activity they are exposed. Nowadays, English language is used as an official language in approximately fifty-seven countries and as a second language in many countries around the world in many areas. In any place people can identify a word in English that is why students from universities in different majors are formed with the learning of this language.

To improve the academic success of students, many majors include in programs or curriculums of studies some English courses. These courses help develop a good knowledge of English that along with the information they have to study students are doubly trained not only with more knowledge in their major but also with new knowledge in a second language. On the other hand, in the case of the System Engineering Major at the University of El Salvador students do not have English subjects in their pensum. For that reason, students might face situations where instructions are necessary to be understood in English. For instance: Terminology, vocabulary, videos, books, theses, etc. Considering these facts, the need of conducting a research was essential to evaluate if there is a real problem or not, how students improve their own knowledge of English in this area, and how the university authorities can support those students with the education of this language.

Additionally, to add some English subjects in the system engineering curriculum are important things that authorities should study to get better the learning process of this kind of students. The main protagonists of this research are students who would benefit directly by getting proposed some levels of English subjects in the system engineering curriculum, that is to say, that System Engineering Students would have the possibility that the University Authorities of this school have a research project to take into account and to consider for a reviewing of the curriculum to see if changes are needed.

I HISTORICAL FRAMEWORK

1.1 Engineering history

Human beings have been adapting their environment to better suit their needs and wants since before recorded history. There have always been people who designed and built tools or other devices to solve problems or improve lives. Facing different situations in different scenarios comes out engineering.

The term engineering is derived from the Latin ingenium, meaning "cleverness" and ingeniare, meaning "to contrive, devise". Indeed, the words ingenious and ingenuity also have the same origin as engineer.

Besides, it is said that engineering concept is the application of <u>mathematics</u> and the <u>physical sciences</u> to the needs of humanity and the development of <u>technology</u>.

The profession known as engineering today emerged during the 1500's when specialists began using mathematics to design military fortifications.

Moreover, engineering it is said that is a term that covers a wide range of applications and industries. Combining mathematics, science and technology, engineers produce creative solutions to real world problems. As a result, there are many different types of engineering degrees available.

This concept has existed since ancient times as humans devised fundamental inventions such as the wheels, buildings, and dress materials. Each of these inventions is consistent with the modern definition of engineering, exploiting basic principles to develop useful tools and objects. Some examples of the oldest engineering disciplines are: Military, Civil, Mechanical and Textile engineering.

1.2 Principals engineering types

Mechanical engineering is one of the oldest and broadest branches of engineering. This field is also referred to as the 'MOTHER' branch of engineering. Mechanical engineering is a discipline of engineering that applies the principle of physics and material science and involves in the production of heat and mechanical power for analysis, design, manufacturing, production, operation, and the maintenance of machine & tools.

Military engineering is loosely defined as the art, science, and practice of designing and building military works and maintaining lines of military transport and communications.

Civil engineering works can be traced back to the 3000 BC such as Old Indian architectures, Egyptian pyramids, and many other old architectures across the world. Civil engineering is a discipline that deals with the design, construction, and maintenance of the physical and naturally built environment, including works like roads, bridges, canals, dams, and buildings.

Textile engineering is also one of the oldest engineering field. Dressmaking is an age-old profession that dates back thousands of years. Some historians would even argue that the history of dressmaking goes back as far as the invention of the needles. Once woven fabrics, like linen and silk, became the norm, dressmaking as a career became very popular and commonplace.

1.3 Inventions in the 19th century

The National Academy of Engineering has announced a list of 14 "grand challenges" for engineering in this century:

- Making solar power economical.
- Providing energy from fusion.
- Developing carbon-sequestration methods.
- Managing the nitrogen cycle.
- Providing access to clean water.
- Restoring and improving urban infrastructure.
- Advancing health informatics.
- Engineering better medicines.
- Reverse-engineering the brain.
- Preventing nuclear terror.
- Securing cyberspace.
- Enhancing virtual reality.
- Advancing personalized learning; and

- Engineering the tools of scientific discovery.

1.4 English as crucial language in engineering field

In our research is important to mention how is engineering nowadays. The key of this specific field is English language. It is the current one of languages international business, technology, aviation, diplomacy, banking, computing, medicine, engineering, and tourism. Most people in the world agree with what Alexander V. Sandoval claims in his essay, 'The Importance of English' on www.eagleforum.com, "English is becoming the world's language of the 21st century".

Engineering is the biggest field of study in the world. As it was said before, English language is a tool that significantly affects engineering students in academic life because of that, it requires to have good English communication competence. Because to its importance in a globalized world where Engineers do not sit back and watch but they make things happen. Using innovation, creativity and a wealth of knowledge, engineering graduates are impacting the world unlike any other.

The world is changing, and engineers are the ones behind so much of this development. The majority of today's services and products have some elements of engineering involved in their conception, at least, paving the way to long, fulfilling and healthy lives for the people influenced by them.

This specific major helps to develop and improve system life, what it means no matter what the prospective student's interest is, there is bound to be one facet of the sector they will find enticing and engaging. Whether it is civil, electrical, chemical, or mechanical engineering, if you like tinkering, creating, designing, or building, the engineering sector is a good choice.

In an advanced technological world, we need engineers to bring ideas into reality. By applying the principles of mathematics and science, engineers develop solutions to the world's biggest technical issues. To accomplish the goal it is important to have English language in the way so this is how the knowledge will be acquired and successfully will be noticed.

Besides that, knowing English allows people to enjoy their life and work no matter where they are. For engineering students whose mother tongue is not English, mastering English is even more important, not only for their academic life but also for their prospective career. When engineering students graduate from the college and become real engineers, they will find that English appears even more crucial than it used to be. Engineers usually work in groups since their task can seldom be solved by an individual. The property of their work determines that being an engineer needs to cooperate and communicate with different people from different parts of the world.

All in all, non-native English engineering students should try hard to improve their English ability, which could help make both their school life and career more successful and enjoyable.

II THEORETICAL FRAMEWORK

2. 1 The importance of the English language for engineering students

English continues being the language of people of the entire world. In this globalized world is essential for students to learn, at least, a basic level of this language. Nowadays, to learn English is not only important in one specific area, but in many fields, professions, majors, etc. because English is broader. There are many fields such as international business, diplomacy, technology, and science. In recent decades, English has been globalized and its used has been widespread provoking the need of people to learn it in their local area and context.

Communication is what people use every day in order to get their wants and desires. "Communication is as fundamental to our social living as eating is to our biological existence. We cannot even imagine our existence without the ability to communicate with each other as we need co-operation for our survival." *(Impact of English on the career of engineering students, page 183).* In our times, the use of technology has increased in many areas, thanks to communication. There are a lot of objects, inventions, theories that have been created, and there are lots of functions, procedures, and contents that have been explained and studied in different parts of the world for different people, but the common aspect is that most of the technological advances, instructions or procedures are first written, or created in English. Systems Engineering and English language are closely related to technology, students from this specialty (Systems Engineering) who are not native speakers of English ought to learn English to prepare themselves better to face this globalized, technological world.

2.1.1 English a communication tool for engineers and engineering students

It has been researched that engineers work in teams therefore it is important to have a high proficiency of English because some English is necessary when students work with people who do not speak Spanish. For engineers is important to communicate with different clients when working, while for engineering students becomes important to understand materials, books, videos, or projects made in

English. There are thousands of information that can be learnt for engineering students and engineering professionals. But in our country the present generation of engineering students from the University of El Salvador are not being formed with this ability of communication in engineering areas. This ability "to understand, read or speak in English" for our students is not obligatory nor included in the academic plan, so they will not be as prepared as others in better countries or universities. For example in India they know that English is the dominant language for science and technology, according to the article taken from *"English for Engineering Students" (page 22*) states that "for them, it is imperative that their students have the requisite proficiency in English so the country can occupy leadership position in the field of science and technology." In our country, engineering students from The University of El Salvador are not being provided with this ability that would help our students with some limitations that exist. That is why research is needed to identify what obstacles among students there are.

2.1.2 English, the key to unlock the doors to get information

It is known that students who study Systems Engineering must deal with information in different languages. Some of them are: books, written articles, research papers, theses, reports, videos, etc. So, students from Systems Engineering ought to learn English to understand various types of information written in the global language and then in their local language. Our subjects of investigation, in the present century, for certain have limitations and they are probably dealing with different situations where they need to apply a knowledge of English, but they maybe do not know what to do. As a group there is an agreement for those countries and universities where English is fundamental for Engineering Students because it has been known that English turns to be necessary at a good level in this major.

For example, it has been found that, in Nepal, English and engineering education have become just like nail and flesh. According to the article **"***Importance of English in Engineering for Professional Communication"* (page 224). A Study in the Nepalese Context says that "they have incorporated English in the curriculum of engineering from the very beginning and the reason was that they felt the necessity of English language for engineering communication in spite that they have Nepali as a common use of

language but this language has its limitations." Later, Knanal, **"Importance of English in Engineering for Professional Communication"** states that "without using English in the present context of the country, the teaching and learning of any scientific and technical subject like engineering is not possible." This information gives the idea that Technology, English language, and Systems Engineering are closely related and fundamental for any engineering students. That is the interest to know why students from the University of El Salvador are not being prepared with this window that unlocked the door to understand a vast of information in English in the field of engineering.

2.2 The study of systems engineering major at the University of El Salvador

This major is called "Ingenieria de Sistemas Informaticos" and it is found in the University of El Salvador since the last years of the previous century. This major lasts 5 years and each year is divided in two periods, semester I and semester II where students can take up to four or five subjects. This school has its own building where there are three computer labs for students for their practices. Some of the services students have access are internet, e-mail, and hours of machine for practices. See website of the general secretariat of system engineering.

When students start studying this major some subjects for them can be: Experimental methods, mathematics I, II, physics I, handling software for microcomputers or programming where apparently some English is just needed in some subjects from the first year. But in the second year the knowledge of English is really more important despite the fact that there are more subjects that require a knowledge in numbers for subjects like physics I, II, mathematics III, IV, probability & statistics or probabilistic methods. So, students continue this major to complete the total of subjects that are up to forty-eight (See pensum). According to the professional profile of this mayor says that students will be able to apply techniques for updated programming and to use scientific programming language. Also, that students will be able to analyze, design, implement, operationalize, and optimize the information systems.

As it was seen at first sight in the curriculum, students from this major must deal with subjects where English may be strongly required. For instance, in the case of the third-year, students have the subject Digital Systems in the first semester and in the second semester the subject Computer Architecture. Both subjects are important for this research because the instruments had been applied for the sample of this investigation.

Another information of the major is the description of its academic training, because according to the professional training in informatics there is a forty percent while with respect to its specialist training in informatics there is a thirteen percent from a hundred percent, see the webpage of system engineering of UES. All this shows that English language must do a lot in informatics and in spite that students do not have English subjects, the knowledge of English is important in different years around the major. But one of the reasons why English subjects are not part of the curriculum of systems engineering is because the major has too much curriculum load and this would make that some important subjects had to be deleted and all of them are important as it seems.

At the end of the major, in the fifth year, students have to take subjects like Databases, human resources, elective technique or professional consulting where a knowledge of English is less important as it seems, but students have to be experts in computers up to this point, then it is the research project for every student as well as the execution of the social work and finally the graduation ceremony to be a system engineer.

2.3 The use of technology in systems engineering majors and its relationship with English

Systems engineering is like a new major in our country and around the world. Its existence does not have more than a half century. There are no fields where systems engineering cannot be found, furthermore, systems engineering is applied everywhere. Besides, systems engineering is associated with technology because everything has to do with computers, software, and hardware. This major pretends that students can

solve problems, analyze, create projects, and manage information by means of processes.

Nowadays, the use of technology is essential in every country because people's needs are related to technology in all their activities. Everything that humans do is done with the aid of a different technology. For example, many activities that governments, schools, companies, or people do require the use of technology in many areas such as accounting, marketing, security, transportation, education, medicine, and so forth. Technology is something that makes people's lives more comfortable and this is the main reason why technology is evolving in time because every time people want to improve their lives for the better. But technology also require the assistance of systems engineers who are humans. So now, that it is known that technology is the core of systems engineering, as well, it is important to say where technology come from. And most of the technology that countries from this region import are from United States that also makes an urgent need for students from systems engineering to know English because technology will for certain bring information in this language. In a word, poor English proficiency will make it difficult for systems engineering students or workers to access key resources in this field. (EF English Proficiency Index).

The following are some reasons why English language has to do with technology:
- Most of the technology comes from countries where English language is spoken.
- Most of the information and books are written firstly in English.
- To certify technology requires knowledge of English.
- Software updating is done firstly for systems in English.

And without taking into consideration that more than half of the 10 million most-visited websites on the Internet are written in English (EF English Proficiency Index). These aspects are meaningful and students who choose this major ought to study the development of computer technology along with a knowledge of the English language too. If successful is desired in this field of Systems engineering, technical English must be there, because there are many phrases associated with technology in English than in any other language. But system engineering is not a static discipline, and English

language also changes as technology does. "Every year there are new words that are added to the English language. Most of them have to do with technology or are a result of technology." (The English helper Blog). Because countries like Canada and E.E.U.U. started booming technology and then other countries incorporated technology in their areas; there were no other language alternatives to incorporate on it than English; so that, the English language was increased everywhere and that communication, instructions and many things in technology were followed into English in the first place.

2.4 Systems engineering majors in different universities in El Salvador

There are many universities in our country, some are big universities and others are small universities. Many are highly prestigious, and others are not. Many offer several majors and others only few majors. Respecting to the major "Systems engineering," not all the universities in El Salvador are offering this major in the same way the University of El Salvador does it. Among the universities that offer this major as an engineering major are: Don Bosco University, Captain General Gerardo Barrios University, Dr. Andres Bello University, Central American University, University of El Salvador, Evangelical University, Francisco Gavidia University, Polytechnic University, Pedagogical University, and Technological University. Likewise, this major, Systems Engineering, is found as a "bachelor's degree" in other universities such as: Dr. Matias Delgado University, Lutheran Salvadorian University and Alberto Masferrer Salvadorian University.

Important details that are found from the different curriculums of this major provided by all the universities on their websites. The number of subjects are from 45 to 49, the time for the major is five years everywhere and many subjects are called similarly or are located in the same level. Regarding the subject of English language this is not present in Universities that have a high prestige but curiously it is in those universities that are small or have a moderate prestige. But the doubt is even greater when it is known that most universities have added English language to their schools' curriculum and then many questions start raising about this, for example: What subjects from system engineering replace English subjects in the University of El Salvador?

What have authorities considered for not taking into account English subjects so far? Or what do authorities from systems engineering do to support students with the absence of a couple of subjects in English? So, it is reasonable to say that English is really important in this area and that maybe there are a couple of subjects that could be replaced by English. In the case of the bachelor's degree in computer science major from Dr. Matias Delgado University, Lutheran Salvadorian University and Alberto Masferrer Salvadorian University only Dr. Matias Delgado University does not include English subjects in its curriculum, but the others do it.

Yes, English is really important in this major, English has a lot to do with this major, and students' limitations exist when there is no presence of this subject in the academic plan. So that, it is the objective of this research to find those obstacles that interfere in the learning process due to the absence of the English language, but this is going to be verified later with the launch of the research instruments.

2.5 Information for Systems engineering students found in English language at the University library and on the internet

The school of Systems engineering has its own library located next to the academic office building. In this building, the library for Systems engineering is located on the second floor at the left side. At this place students can find various books for the systems engineering major, but there is little information found in English language according to the clerks who are in charge of the library. Besides, they say that the books that are found in English are very old and totally outdated. Correspondingly, most of the times students do not usually come to request English books for their activities and that is the main reason why not many English books are kept in this library. Apart from that, the library has its own website where students can find lots of information for their activities, but also there is little information in English. On the other hand, on internet, systems engineering students can get tons of information in Spanish as well as in English, such as textbooks, dictionaries, tutorials, projects, and dissertation papers. But the information found in English language is evidently too much more extensive than the information found in Spanish language, for example on this website Openlibra.com

there are hundreds of interesting books for engineering students where most of them are written in English. This website must be of total interest of any systems engineering student because books are for free, but if a student does not know English this website would not be of his interest at all. Another example, on the internet, where students can get updated English books for systems engineering, but this time paid it is by means of the platform called "www.amazon.in". This platform also offers thousands of books in many languages for systems engineering students especially in English language.

There is no doubt that for a systems engineering student who does not know English, the acquisition of knowledge in his field would be limited because only Spanish information were chosen by that student and such student will not be totally prepared at the end of the major. So, to sum up another important reason why English ought to be part of the Systems engineering major at the University of El Salvador is because there is too much more information in English language than in Spanish language, both on internet and on e-books.

2.6 The importance of knowing English language in engineering major

Understanding that Engineering is an occupation with extremely wide reach and knowing that the term 'engineering' covers many fields and, by extension, many skills, it is possible to say that Engineers are scientists, inventors, designers, builders and great thinkers. They improve the state of the world, amplify human capability, and make people's lives safer and easier.

Since an engineer is catalogue as was mentioned before it is because they perform different skills, some of them are presented as follows: the scientific method - social, cultural and economic awareness, mathematics, biology, chemistry, physics and other areas of science, creativity, teamwork and some others; It can be said that one of the most rewarding aspects of the engineering experience is the ability to connect with others. Nowadays, one of the most significant international languages is English, it is not only nominated as the universal language or global language, but also as the

language of prestige and power, it's being used worldwide, and one can barely communicate and integrate internationally without speaking English.

Likewise, in the study of engineering the most used language is English. Definitions, concepts, tools, technology, books, and many other sources that can be mentioned in this investigation are presented to the engineering lovers in the global language "English." So that, being able to communicate, to read, to listen, to understand this global language is a skill that one engineer of this Prestige University must have. Bilingual engineers have the unique opportunity to work with a wider range of people in their personal and professional lives.

If the engineering department gave the students the opportunity to acquire the knowledge of the English language, the major would be responsible for ensuring the future engineer a better development in the process of their academic training with purpose and standards, with quality assessment procedures in place to uphold those standards, and in that way open a smooth path for those students that have the capability to become engineers but never before have been in contact with the English language.

Due to achieve the previous vision of what an engineer must be, a system should be created for the engineering student to acquire the English language from the basic to the advanced level, of course focused in the engineering area.

Currently, a foreign language means developing a new complex system of rules to grasp how words combine to make phrases, the ability to make sentences and understand how they are pronounced, also, and most importantly, to learn how to comprehend and create messages that convey the desired meaning. This is the reason why to advance in an engineering major, a great effort must be done. The student must learn both grammar and spelling properly to move towards their end goals in the major.

Vocabulary learning is an essential part in foreign language learning as the meanings of new words are very often emphasized, whether in books or in specific area. When learning a language, it is essential that you understand textbook definitions,

and how the language itself works. While a textbook plays a huge part in your learning, speaking with people in real life and immersing yourself in the language is the only way you will become fluent.

However, there is no more profitable investment than investing in a better education for the engineers of tomorrow, nobody can never go wrong with it. George Steiner once said: "When a language dies, a way of understanding the world dies with it, a way of looking at the world."

So, ending with the question - how many languages does a student need to speak for a successful major? A student has to be sure that each additional language will give it more advantages and ways to proceed in a major successfully but English has to be the first one aside the native language.

III METHODOLOGY

3.1 Research approach

This study was carried out by means of a mixed-method and an "Inductive Research," because it is planned to generalize the problem with specific findings. As well, the study might develop new information derived from the analysis of the collected data. *No theories or hypotheses would apply in inductive studies at the beginning of the research and the researcher was free in terms of altering the direction for the study after the research process had commenced* (Research methodology). This was a bottom up research because the study has begun with detailed observations of the problem, which has moved towards more abstract generalizations and ideas about it.

3.2 Research design

This study was developed through: Exploratory sequential mixed methods because it began with a qualitative research phase and the views of the participants were explored later. Furthermore, the results were analyzed to present them into qualitative or quantitative information. Also, the use of non-experimental design such as surveys was made.

3.3 Research methods

In this section the use of questionnaires was needed to collect data because it was important to compare information from many Systems engineering students who might be facing the problem, so both, open and closed ended questions were needed in the questionnaires. Secondly, some interviews were needed with some teachers and the branch coordinator to collect more valuable information to have a better view of the problem.

3.4 Population

The accessible population for the research was taken from the School of Systems Engineering, at the University of El Salvador, San Salvador. This major lasts 5 years and the population is formed with: a) Students of the third year that are taking the subject "Arquitectura de Computadora" and students of the fourth year taking the subject "Diseño de Sistemas" in semester II who are active in the year 2019, b) Teachers of subjects that have a relation with the problem studied in this major, c) The Head of the Department, and d) The Interim Director.

3.5 Sample

The process of selecting the sample was taken by non-probability sample, because not all students or teachers could give the necessary information than if a random selection were taken. On the other hand, the type of sample that has been chosen was purposive sample, because personal judgments have been considered to select a good representative sample, that is to say, to handpick the subjects was needed. For example, things to consider were: the level of students, the names of the subjects, teachers in charge of those subjects and who might be experiencing the problem, besides, the opinions of authorities from this major.

3.6 Instruments

The use of two instruments was implemented, these were: Questionnaires & interviews. The questionnaire had 15 questions divided into three or four sections,

besides, some open questions were included, too. The second instrument, interviews, was directed to some teachers and coordinator(s). The purpose of the interviews was to know the points of view concerning the problem researched.

DATA ANALYSIS

1.1 ANALYSIS OF THE QUESTIONNAIRES

This part discusses the data analysis and findings from observation guides, questionnaires, and interviews. The purpose of this was to identify limitations that engineering students may face in the learning process due to the absence of English subjects.

1- ¿Has tomado clases de inglés?

■ sí   ■ no

27%

73%
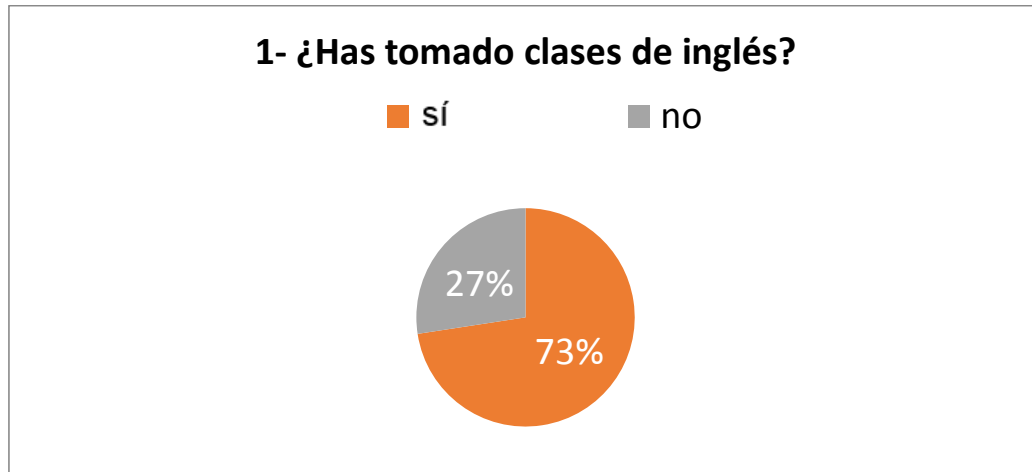
This graph shows that most of the students have taken English classes that shows that few students could face limitations in their learning process.
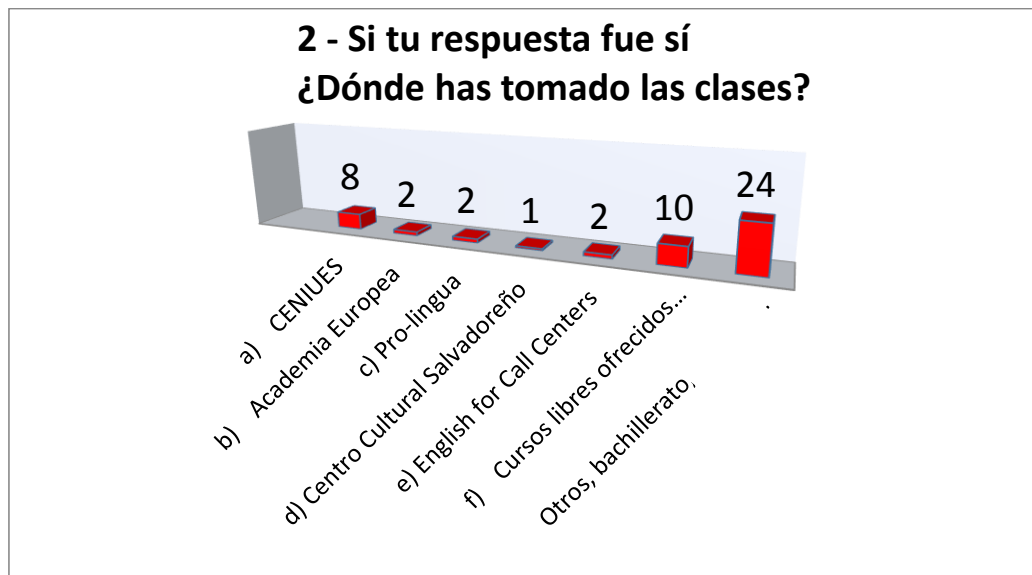
**2 - Si tu respuesta fue sí
¿Dónde has tomado las clases?**

8   2   2   1   2   10   24

a) CENIUES
b) Academia Europea
c) Pro-lingua
d) Centro Cultural Salvadoreño
e) English for Call Centers
f) Cursos libres ofrecidos...
Otros, bachillerato,

Footnote: The data is based on the total of students, they are not expressed in percentages.

The graph shows that most students have taken English classes and most of the knowledge acquired comes through public institutions. In addition to that,

the free courses also have a high percentage of students, contrary to this, the minority has taken formal English courses. This means that few are formally prepared in the English language.

3 - ¿Cuál consideras que es el nivel de inglés que posees?

■ a) Nulo   ■ b) Principiante   ■ c) Básico

■ d) Intermedio   ■ e) Avanzado
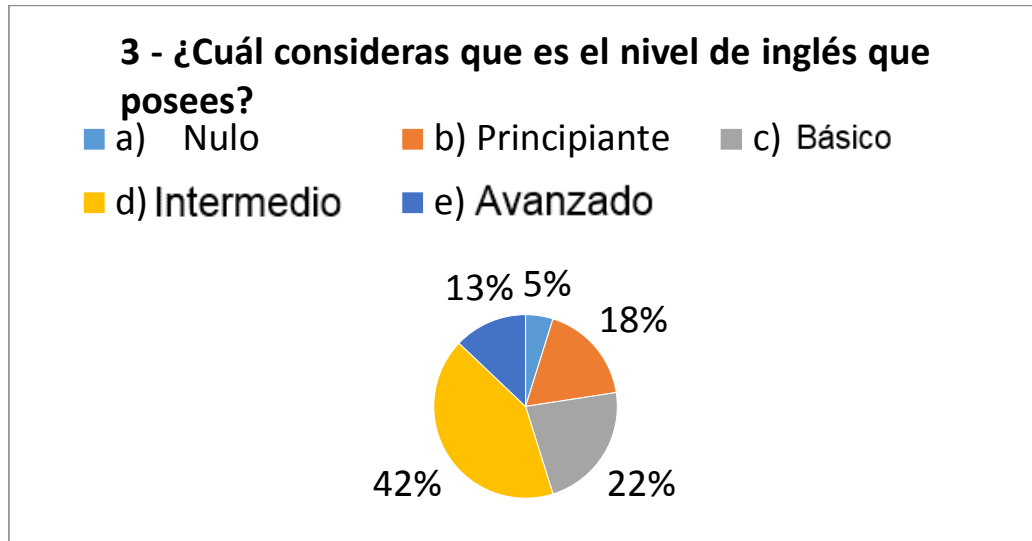
This graph expresses the opinion of the students with their self-assessment according to the level of English that they express to have, this shows varied percentages. However, there is a null percentage that attracts attention and presents a high intermediate level.

4 - ¿Conoces del curso en linea que ofrece la FIA?
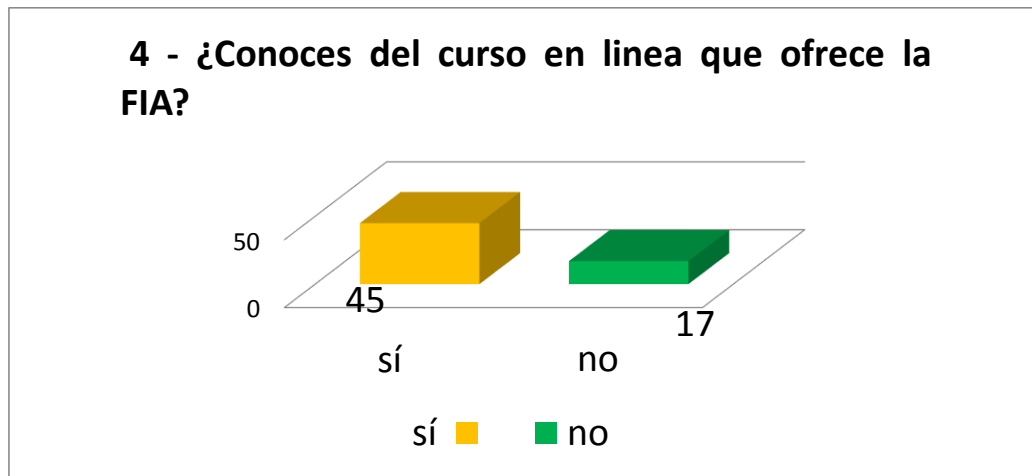
Footnote: The data is based on the total of students, they are not expressed in percentages.

In this graph, we can see that although these English courses are in the same major to which the students belong but the authorities have not achieved that

these courses could be known by most of them since there is a good percentage of students who do not know them and also that neither the students themselves have been interested in knowing them.

5 - ¿Cuán beneficiosos consideras que son los cursos ofrecidos por la FIA?

■ nada　■ poco　■ más o menos　■ mucho

29%　3%　18%

50%
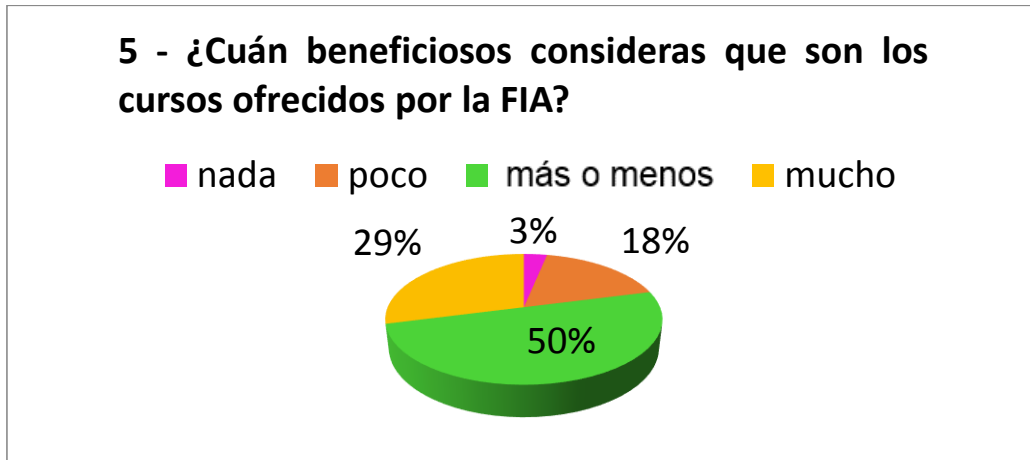
The graph shows that there is an acceptance of the courses offered by the FIA. However, the percentage only reflects 50%, which in our opinion could be that even students consider it as not very formal courses.

6 - ¿Ha enfrentado alguna dificultad en la carrera de Ingeniería en Sistemas por la ausencia de materias en inglés en la malla curricular?

■ sí　■ no

35　27

40

20

0

sí　no

Footnote: The data is based on the total of students, they are not expressed in percentages.

This graph responds to the objective of our survey since we can see that most have had some difficulty due to the absence of the English language.

In this graph, we can see that the main objective of our research was answered, since we want to know if the students are having problems due to the absence

of the English language and through the graph we can see that most say they have had some difficulties despite that many have expressed having taken classes or having intermediate knowledge.

7- ¿En qué materia(s) considera usted ha sido requerido más conocimiento de inglés?
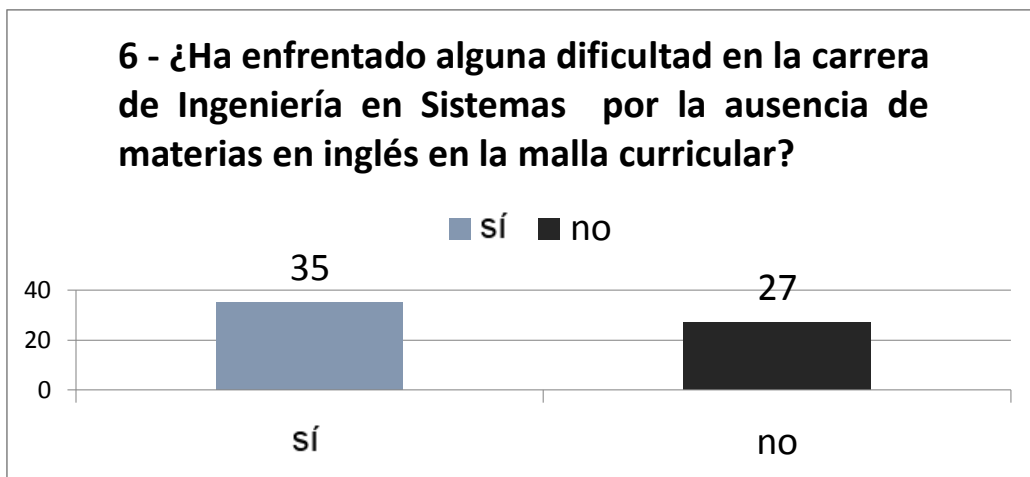
Footnote: The data is based on the total of students, they are not expressed in percentages.

Based on the percentage of students who answered "Yes" in the previous question we can see that the one that has required the most knowledge of English is the option "others" which subject is **probabilistic methods,** however, some knowledge of English is indispensable since there are more subjects in which the English language is needed according to the graph.

8 - ¿A qué tipo de dificultades o limitantes como estudiante se ha enfrentado al momento de cursar alguna materia donde se requiera conocimientos de inglés?

Bar chart values:
- a) Perdido totalmente al momento de...: 2
- b) Incapacidad de entender la mayor...: 9
- c) Mala interpretación de la información: 10
- d) Requiero ayuda de otras personas...: 1
- e) Se me complica entender la...: 14
- f) He reprobado la materia: (no value shown)
- g) Todas las anteriores: 0
- h) Otras limitantes: 3

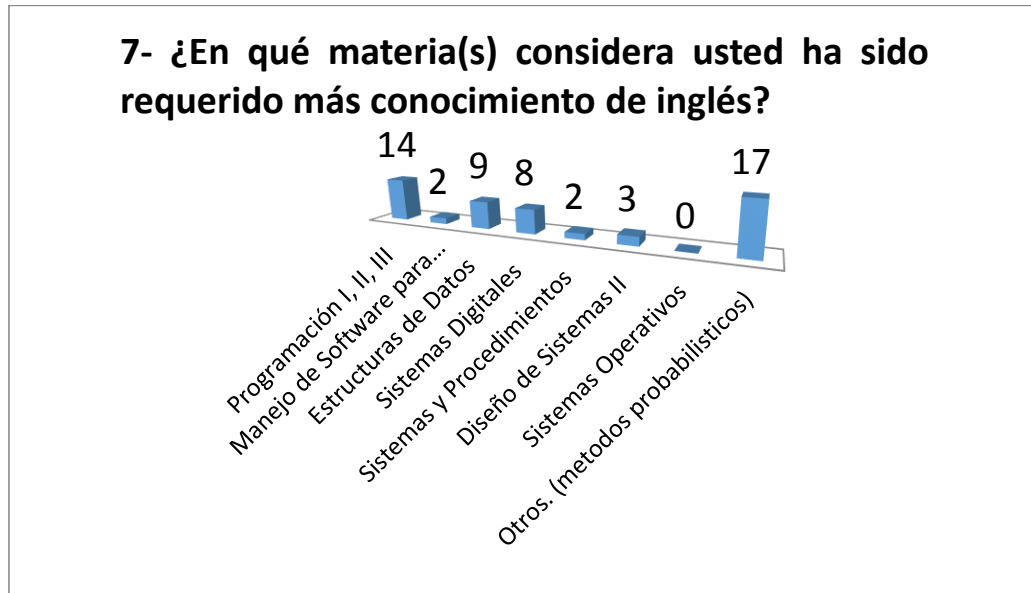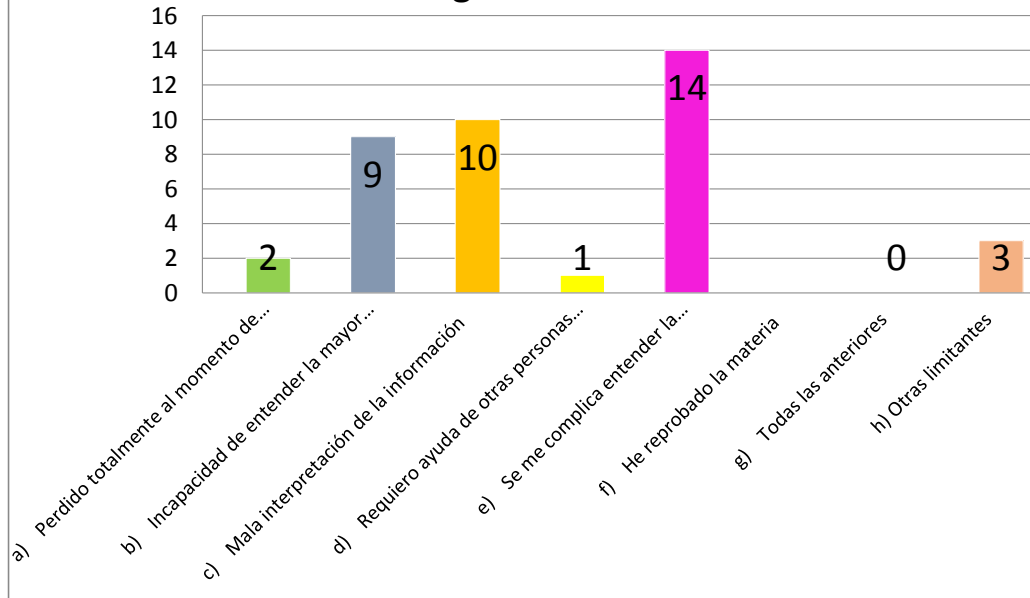*Footnote: The data is based on the total of students, they are not expressed in percentages.*

The graph presents the examples of limitations that students face in the learning process, it gives as a result the option "e." **It is difficult for me to understand the information if I do not use translators.** This means that the lack of English subjects would result in having to use translators.

09 - ¿Consideras importante la integración de la materia de inglés en la carrera de Ingeniería en Sistemas?

- 10%
- 9...

Legend: ■ Sí ■ No ■ Abstención
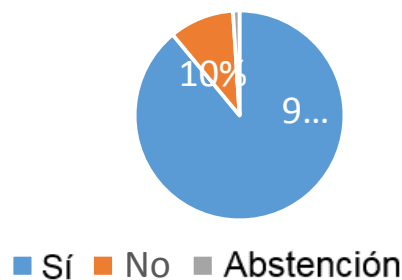
According to this graphic, most of the students agree that it is important to have English subjects in the academic plan, that is to say, that the same students are conscious about English subjects because these would help them in the process of study.

10 - ¿Qué nivel de inglés considera que se requiere en la carrera de Ingeniería en Sistemas?

9%

29%

61%

■ Ninguno   ■ Básico   ■ Intermedio   ■ Avanzado
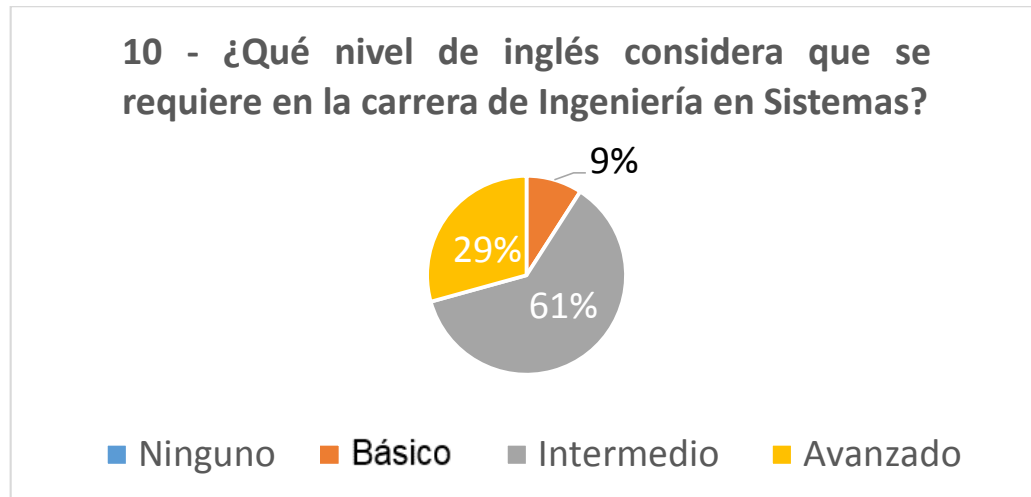
In this graphic most students think that it is required an intermediate level of English to face the major. This, based on our opinion, would need of, at least, four subjects of English language.

11 - A la hora de realizar tareas o actividades en su carrera de Ingeniería en Sistemas ¿Consulta o suele consultar libros, videos o sitios web con información en inglés?

5%

95%

■ Sí   ■ No
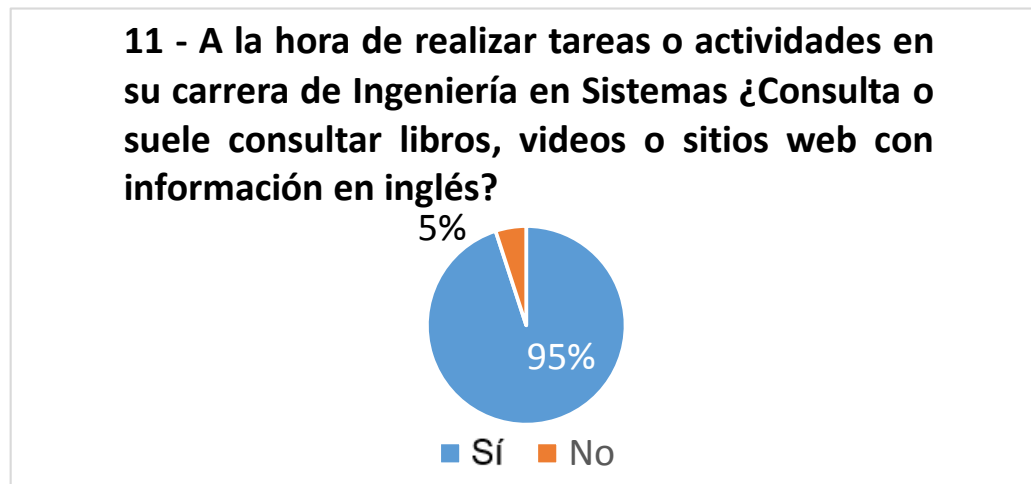
This graphic confirms that students from System engineering really needs some English subjects because they consult English information many times.

12 - ¿Cómo hace un estudiante de ingeniería en sistemas para entender información escrita en inglés necesaria para el desarrollo de actividades académicas?

13%
2%
85%

■ Consultan traductores ■ Mediante Videos ■ Vocabulario
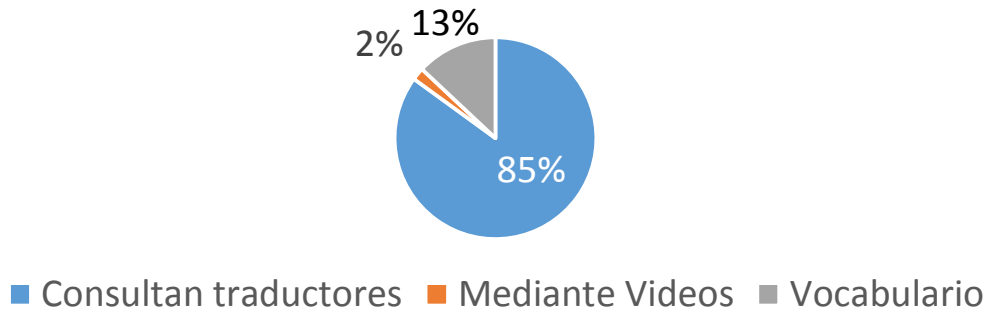
Based on the graphic, students make use of technology that there exists, above all, online translators. In other words, the result shown is what it was expected.

13- ¿En una escala del 0 - 10. ¿Qué importancia le da al idioma inglés para el desarrollo de tareas y actividades dentro de la carrera en ingeniería en sistemas?

6%
6%
28%
19%
10%
31%

SCALE

■ 5 ■ 6 ■ 7 ■ 8 ■ 9 ■ 10
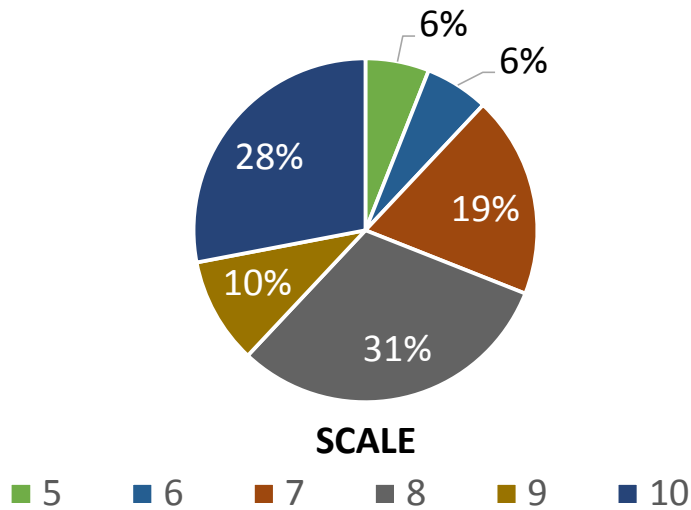
It seems that the level of importance, based on students' opinions is an eight from a scale from one to ten. So, this result shows that it is strongly important to take into consideration the inclusion of English subjects in the major.

14 - ¿Considera usted que al no incluir materias en inglés en la carrera de ingeniería en sistemas limita a estudiantes a buscar información asociada a tareas o actividades asignadas en algunas materias de la carrera y por lo tanto el estudiante mejor se

24%

76%

■ Sí ■ No
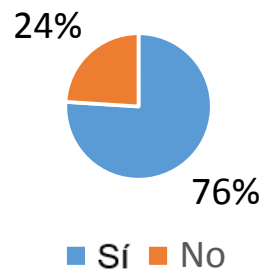
The graphic shows that when students don't have a knowledge of English they limit themselves to acquire knowledge up-to-date or at the latest.

15 - En la actualidad, dentro de la web y la tecnología, según su opinión. ¿En qué idioma es mayormente hallada la información para el desarrollo de clases, actividades o tareas dentro de la ingeniería en sistemas?

2%   3%

95%

■ Inglés   ■ Español   ■ Ambos Inglés y Español
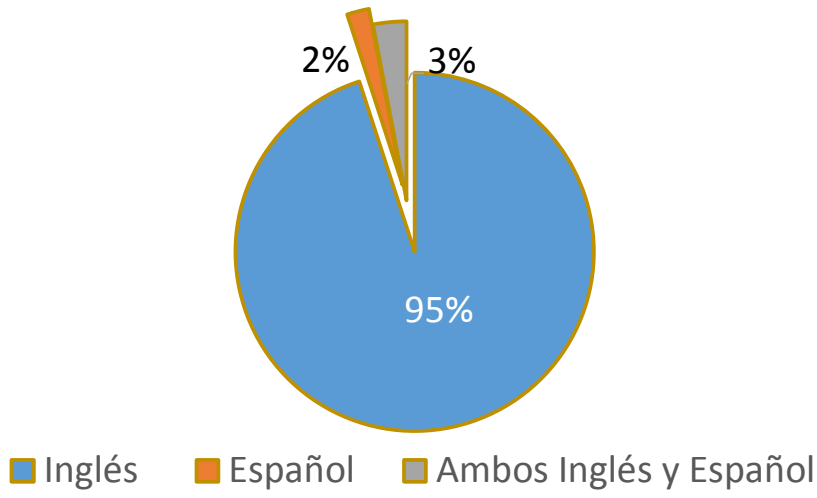
According to the graphic's results the English language has a 95% while Spanish has less. This leads that there ought to have a big demand in the learning of English language in the major because students are confirming that most of the information is found in English, and secondly in Spanish.

1.2 ANALYSIS OF THE INTERVIEWS

The interviews were carried out to five persons. The interim director, the head of the department and three teachers that belong to this major. Six questions were made to everyone. In the first question, teachers agree that the English subject is really important in this major, but more than a subject, the most important is to get a knowledge of English because the English has a lot to do in the major starting from the first year. As well, technological advances that continues, the demand in a professional way on students and the new information generated by all engineering majors. So, teachers can see that the understanding of English is fundamental than having some simple subjects in the academic load.

With respect to the limitations that are found when students do not know English and take some subjects in the major. Teachers' opinions vary. For example, in some subjects there is too much information into Spanish they say. Likewise, some teachers already provide students with the material translated. On the contrary, there are some subjects where there is no choice because all the materials come in English, therefore, there is too much difficulty on students to develop academically. So, the problem is more noticeable only in some subjects. This confirms that there are limitations during the learning process.

Now, in referring to include English as a subject. Interviewees hold that authorities prefer to give support in the area of English than to include English subjects because there are many important contents and subjects in the major that could not be omitted. Therefore, it is best that either the student or the lecturer specializes himself in this area of English separately. Only one interviewee said that he was unaware why English subjects were not part of the major. This means that authorities feel comfortable in the way they are now working, and it seems that English subjects will not be part of the major for a long period of time.

Regarding technical English, answers differ because some think that it might be 4 semesters, others think that it might be 3 semesters or 2 semesters. And one of the interviewees thinks that everything depends on what students already know. So, it is difficult to establish how many levels of technical English are necessary, but more research might be needed in this part.

But the strategies that students do for the learning of the English language are: Students take private courses; students take the course provided by FIA or online courses. But to overcome homework, activities or contents related to English language students use online translators, opt for Spanish information instead or maybe get a friend who knows English to help them. This means that students are conscious that they need to know English in anyway, so they do their part as well as teachers.

Finally, considering when the English language is more required, interviewees said that the language is required during all the major. But even students ought to know English beforehand. So, if there is to mention a specific year all of them said that from the third year is extremely important to know good English. This indicates that students must prepare themselves, otherwise they will be in trouble in one year or another.

CONCLUSIONS

As researchers after analyzing the results of this research it was concluded, taking into account our main objective that the lack of English education in the major of system engineering has caused an incomplete learning-process because students are surrounded with a vast of English information in many courses but many of them do not know any English, therefore, one limitation is that **they cannot enrich their knowledge if the majority of information in sources is found with contents in English language.** Moreover, based on the results obtained in the surveys, a second limitation is that many students (56%) confirmed that they have difficulties in their learning process due to **the technical vocabulary that the major requires**, consequently, the lack of knowledge in the learning of any course where English is used, leads to a third limitation that is **the use of online translators** giving as a result a momentary learning and dependence on them.

Taking into consideration the 5 specific objectives that our research has we conclude that: First, it can be mentioned that in the courses where students (31%) express having more difficulty in the learning process due to the lack of English courses are **"Probabilistic methods"** because of its high content of technical vocabulary in turn another percentage (25%) manifests to have difficulty in the courses of **"Programming"**. Students overcome this difficulty by searching for information in Spanish either in books or more commonly on websites. On the other hand, another percentage (42%) of these same students have an English intermediate level and that helps them infer respect to topics or concepts with high content of English language.

As a second conclusion to point out is that students begin to feel more difficulty **in the third year of the major** because the content of more courses has to do with information found in English, but it is mandatory for students to have an English intermediate level since some contents have a strong relation with the English language starting from the first year in the second semester. Other examples of courses where this level is required are: data system, data structure, all of this is referring to graphics interpretation.

Third, most students consider totally important some subjects of English because in this major some teachers assume that they already know the language. Besides, some students think that a technical English in this area would be perfect because there are many resources that are based on English language, for example: videos, written information on internet, books, software, databases, manuals, programming languages, contents, etc. Students express that the best and up-to-date information is in English, even though, sometimes the information is exclusively in English and also in some courses teachers provide them with material in English, therefore, at least, some subjects of technical English are needed there.

Fourth, based on the mixed method is concluded that there are limitations like comprehension, limited information, insecurity, because most students (95%) agreed that they faced with many resources in English so English courses are important to be part of the major and since there are many subjects where the technical language is needed students ought to learn, most of all, this kind of technical language to reduce their limitations.

Fifth, now based on the inductive research the following conclusion has been stated, students need to learn most of all technical language to be comfortable when taking any subject where English language is required so they do not have limitations. And to avoid the absence of English is better to learn English by oneself with the help of internet or to take an English course for engineering systems students on the web or to take the English courses offered by the FIA instead of paying a formal long course in an academy.

RECOMMENDATIONS

FOR STUDENTS:

- Students should study English by themselves by means of buying books or by an online course, because taking a formal English course requires a lot of time and money.

- Students should take into account that many of them already know some English, but students should focus mainly on technical English for system engineering because they have to prioritize their area of study.

- Students should put more effort to the skills of reading and writing, because the speaking and listening are not at all important during the learning process.

- Students should buy a gadget to use to translate some texts into Spanish. (This can be used in a similar way students use calculators in math courses)

- Students should decide to take at least once in the semester one of the English courses provided by the FIA to evaluate if the courses are good enough or not to learn English.

FOR TEACHERS:

- Teachers should provide students with a handout referring to their courses with common information and vocabulary of technical English that students will use during the course teachers will teach, thus, students can review and familiarize with the language beforehand.
- Teachers should also require students to buy a gadget to use to translate some texts during classes.

- Teachers should motivate students to acquire and improve their English level through readings, audiovisual classes, besides, with expositions and topics related with the engineering field.

FOR THE SYSTEM ENGINEERING DEPARTMENT:

- This recommendation is addressed to the head of the department to establish a mandatory hour at least once a week for an English reinforcement in which teachers can enrich their vocabulary, pronunciation and knowledge in order to answer and reduce student's limitations.

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DATA COLLECTION

RESULTS OF THE QUESTIONNAIRES

Year: 2019
Population: Students from system engineering major
Sample: Students from Diseño de Sistemas II and Arquitectura de Computadoras.
Number of people: 62 students
Semester: II
Male: 43
Female: 19

Preguntas	
1 – ¿Has tomado clases de inglés?	
Sí	45
No	17
Total	**62**
2 – Si tu respuesta fue sí ¿Dónde has tomado las clases?	
a) CENIUES	8
b) Academia Europea	2
c) Pro-lingua	2
d) Centro Cultural Salvadoreño	1
e) English for Call Centers	2
f) Cursos libres ofrecidos por la FIA	10
Otros, bachillerato, INSAFORP, diferentes academias	24
Total	**49**
3 – ¿Cuál consideras que es el nivel de inglés que posees?	
a) Nulo	3
b) Principiante	11
c) Básico	14
d) intermedio	26
e) avanzado	8
Total	**62**
4 - ¿Conoces de cursos en línea que ofrece la FIA?	
Sí	45
No	17
Total	**62**

5 ¿Cuán beneficioso consideras que son los cursos ofrecidos por la FIA?	
Nada	2
Poco	11
Más o menos	31
Mucho	18
Total	**62**
6 - ¿Ha enfrentado alguna dificultad en la carrera de Ingeniería en Sistemas por la ausencia de materias en inglés en la malla curricular?	
Sí	35
No	27
Total	**62**
7- ¿En qué materia(s) considera usted ha sido requerido más conocimiento de inglés?	
Programación I, II, III	14
Manejo de Software para microcomputadoras	2
Estructuras de Datos	9
Sistemas Digitales	8
Sistemas y Procedimientos	2
Diseño de Sistemas II	3
Sistemas Operativos	0
Otros. (métodos probabilísticos)	17
Total	**55**
8 – ¿A qué tipo de dificultades o limitantes como estudiante se ha enfrentado al momento de cursar alguna materia donde se requiera conocimientos de inglés?	
a) Perdido totalmente al momento de seguir procedimientos e instrucciones	2
b) Incapacidad de entender la mayor parte de la información	9
c) Mala interpretación de la información	10
d) Requiero ayuda de otras personas que sepan inglés para realizar mis actividades	1
e) Se me complica entender la información sino uso traductores en línea	14
f) He reprobado la materia	0
g) Todas las anteriores	0
h) Otras limitantes	3
Total	**39**

9 - ¿Consideras importante la integración de la materia de inglés en la carrera de Ingeniería en Sistemas?	
sí	55
No	6
Abstenciones	1
Total	**62**

10 - ¿Qué nivel de inglés considera que se requiere en la carrera de Ingeniería en Sistemas?	
Ninguno	
Básico	6
Intermedio	38
Avanzado	18
Total	**62**

11 - A la hora de realizar tareas o actividades en su carrera de Ingeniería en Sistemas ¿Consulta o suele consultar libros, videos o sitios web con información en inglés?	
Sí	59
No	3
Total	**62**

12- ¿Cómo hace un estudiante de ingeniería en sistemas para entender información escrita en inglés necesaria para el desarrollo de actividades académicas?	
Consultando traductores	41
Mediante videos	1
Vocabulario	6
Total	**48**

13- ¿En una escala del 0 – 10. ¿Qué importancia le da al idioma inglés para el desarrollo de tareas y actividades dentro de la carrera en ingeniería en sistemas?	
0	
1	
2	
3	
4	
5	4
6	4
7	12
8	19
9	6
10	17
Total	**62**

14 - ¿Considera usted que al no incluir materias en inglés en la carrera de ingeniería en sistemas limita a estudiantes a buscar información asociada a tareas o actividades asignadas en algunas materias de la carrera y por lo tanto el estudiante mejor se basa en información en español?	
Si	47
No	15
Total	**62**

15 - En la actualidad, dentro de la web y la tecnología, según su opinión. ¿En qué idioma es mayormente hallada la información para el desarrollo de clases, actividades o tareas dentro de la ingeniería en sistemas?	
Inglés	59
Español	1
Francés	
Otro	
Ambos, Inglés y Español	2
Total	**62**

INTERVIEW: No 1

UNIVERSIDAD DE EL SALVADOR
FACULTAD DE CIENCIAS Y HUMANIDADES
DEPARTAMENTO DE IDIOMAS EXTRANJEROS

TEMA: *LIMITANTES DE LOS ESTUDIANTES DE INGENIERÍA EN SISTEMAS DEBIDO A LA AUSENCIA DEL IDIOMA INGLÉS EN LA MALLA CURRICULAR.*

Objetivo: Obtener información acerca de las limitaciones o dificultades que se enfrentan los estudiantes de Ingeniería en Sistemas de la Universidad de El Salvador al momento de requerir el uso de conocimientos del idioma inglés durante el proceso de enseñanza y aprendizaje a lo largo de la carrera.

Indicación: Lea con atención cada pregunta y responda con sus propias palabras cada una de ellas.

Nombre: Rodrigo Ernesto Vásquez Escalante.
Cargo desempeñado: Director Interino.

1 - ¿Considera usted la materia de inglés, importante en el proceso de aprendizaje de los estudiantes de la Facultad de Ingeniería?
Sí / No
¿Por qué?

Por supuesto que es importante, sobre todo porque digamos que nuestra carrera en la cual estamos formando informáticos es una carrera técnica, entonces por ejemplo en el área de hardware o software digamos las especificaciones vienen en inglés. Además, los avances que se dan en estos países desarrollados. Si nosotros vamos a optar por la tecnología y por lo tanto de alguna manera debemos de conocer el inglés técnico que es lo que más se emplea en la actualidad. Entonces es muy relevante para la carrera tener este conocimiento a la mano para ir comprendiendo mejor.

2 - ¿Ha encontrado dificultades en los alumnos para cursar la materia debido a que no poseen conocimientos del idioma inglés? ¿Cuáles?
Mencione:

En el caso de la asignatura que imparto "Estructura de datos", este, no hay mucho inconveniente con el idioma inglés por una sola razón que hay mucha bibliografía en español. Quizás, inicialmente hace muchos años era complicado

porque eran bien digamos, bien específicos, son temas de especialización entonces digamos toda la terminología que está asociada con estructura de datos también ha tenido un origen digamos en Estados Unidos en países desarrollados incluso en Rusia temas que se estudian ahí pero que hoy por hoy ya hay mucha información en español hay mucha bibliografía entonces pues no se presenta inconveniente en ese sentido.

3 - ¿Qué opinión tiene del por qué no se ha implementado la materia de inglés en la facultad de Ingeniería?
Explique:

Aquí en la facultad ya se ha discutido la importancia del inglés y aunque no se ha considerado como parte de los programas se han buscado alternativas creo, que ya les mencioné la vez anterior que la misma facultad tiene un profesor un nativo digamos de los Estados Unidos y también han contratado a otros profesores que imparten cursos en inglés, pero que se desarrollan de manera paralela al pensum de la asignatura. Aunque hoy por hoy, no son obligatorios hay muchos estudiantes que se inscriben en estos cursos, en el último por ejemplo hay una matrícula de quinientos estudiantes. Ahora, también se está utilizando una modalidad distinta, digamos, por un lado se está trabajando con una modalidad presencial con un profesor nativo de los Estados Unidos y por otro lado se están impartiendo cursos en modalidad en línea, entonces, está permitido que más estudiantes se incorporen al aprendizaje, por supuesto, que no es un aprendizaje completamente formal como si alguien estuviera en una carrera de idiomas, pero se tiene, digamos, ese componente de forma libre porque al final, digamos, los cursos se pueden considerar incluso para hacer un toefl. La Universidad está tratando de trabajar paralelamente con cualquiera de los programas de las carreras de ingeniería porque en estos cursos pueden inscribirse estudiantes de cualquier ingeniería.

4 - Si se implementara la materia de inglés técnico en esta Facultad (Ingeniería), ¿Cuántos niveles considera necesario para el proceso de aprendizaje de los estudiantes?
Explique:

Bajo este supuesto yo creo que se haría lo mismo que se está haciendo hoy paralelamente en el sentido que deben ser los niveles necesarios como para que alguien pueda dominar el inglés no a un cien por ciento pero que al menos digamos pueda la lectura eh pueda comprenderlo y eso implica que debería estudiarse por lo menos dos años ¿verdad? A veces se vuelve el inglés de

mayor utilidad quizás por lo menos cuatro ciclos que es lo que comúnmente se estudia como un toefl ya para tener un nivel avanzado.

5 - ¿Qué estrategias considera usted que el estudiante utiliza para el aprendizaje del idioma inglés y sobrellevar las exigencias de la carrera?
Explique:

Bueno hoy por hoy quizás en el área de la carrera en la que yo me encuentro es mucho más simple porque el estudiante utiliza tecnología, utilizan los traductores. El estudiante agarra un artículo y agarra digamos Google translator pone ahí y aunque tal vez no tiene una traducción tan fidedigna como si lo hiciera un traductor, pero ya es útil ya lo van dejando cerca de lo que de verdad se está tratando de decir en el artículo o en la comunicación que busca. Casi siempre hay muchos artículos complejos pero lo más común es que alguien agarre un párrafo y entonces esa utilización de la tecnología le facilita un poco; digamos es una estrategia más rápida que tiene un estudiante aun cuando no conoce un idioma porque ya siente que no está en esa área de aprenderlo ya siente que puede agarrar un bloque y aprenderlo yo creo que el mayor problema es cuando la gente tiene que comunicarse cara a cara con alguien ahí sí, pero digamos que una estrategia para ir revisando los contenidos de la asignatura pues eso solo es algo práctico y de verdad que es lo más utilizado por ellos.

6 - ¿En qué año de la carrera considera usted que a los alumnos les es importante poseer conocimientos del idioma inglés?
Explique:

Bueno en nuestra carrera es a lo largo de toda la carrera, pero para nosotros es más vital en el área de especialización. En otro estudio que se implementó a partir del tercer año porque eh son áreas bien especializadas donde se requiere tener un muy buen nivel de inglés técnico en este caso que le permita mejor aprender algunos contenidos, algoritmos que son los que nosotros revisamos acá. Quizás, digamos, como más relevante, pero en realidad desde que inicia la carrera ya necesita conocimiento la persona, no hay mucho margen para decir que no es necesario e importante a lo largo de toda la carrera y mucho más importante cuando se entra al área de especialización.

INTERVIEW: No 2

UNIVERSIDAD DE EL SALVADOR
FACULTAD DE CIENCIAS Y HUMANIDADES
DEPARTAMENTO DE IDIOMAS EXTRANJEROS

TEMA: *LIMITANTES DE LOS ESTUDIANTES DE INGENIERÍA EN SISTEMAS DEBIDO A LA AUSENCIA DEL IDIOMA INGLÉS EN LA MALLA CURRICULAR.*

Objetivo: Obtener información acerca de las limitaciones o dificultades que se enfrentan los estudiantes de Ingeniería en Sistemas de la Universidad de El Salvador al momento de requerir el uso de conocimientos del idioma inglés durante el proceso de enseñanza y aprendizaje a lo largo de la carrera.

Indicación: Lea con atención cada pregunta y responda con sus propias palabras cada una de ellas.

Nombre: Elmer Carballo
Cargo desempeñado: Jefe de Departamento

1 - ¿Considera usted la materia de inglés importante en el proceso de aprendizaje de los estudiantes de la Facultad de Ingeniería?
Sí / No
¿Por qué?

Definitivamente sí, el inglés, todos los avances tecnológicos en términos de ingeniería en sistemas están en el idioma universal que es el inglés. Otras de las razones es que cuando una persona no sabe inglés le cuesta cualquier herramienta, cualquier tecnología, porque de alguna manera es el lenguaje técnico que tienen las diferentes plataformas de trabajo de un sistema, es en inglés. Por otro lado, el mercado mundial en el caso de sistemas existe un mercado internacional, es decir que usted puede trabajar con empresas multiculturales de otras regiones de otros países y el lenguaje con el que usted se va a comunicar es en inglés. De hecho, se considera que una persona en sistemas que no sepa inglés tendrá menos oportunidades en el tiempo, pueden ser casi nulas, sin oportunidades de trabajo para que tenga una idea. Es también importante hasta en el nivel salarial a nivel de estímulo. Un desarrollador que se conoce aquí como JavaScript es un programador en lenguaje Java Script en español a lo que más aspira de su salario es $1,500 y

puede tener 10, 15 años de experiencia y no va a pasar de ahí. Un desarrollador JavaScript sabiendo inglés gana el doble $3,000.

2 - ¿Ha encontrado dificultades en los alumnos para cursar la materia "Tecnologías orientadas a objetos" debido a que no poseen conocimientos del idioma inglés? ¿Cuáles?
Mencione:

Absolutamente, en el caso de por solo una materia que se llama tecnologías orientadas a objetos es una materia que su enfoque es ver de punta, perdón, los avances tecnológicos por lo tanto la mayoría de información que ellos reciben de esa materia está en el material, yo lo traduzco al español, pero si ellos quieren profundizar en los temas la mayoría de temas van a estar en inglés, los libros van a estar en inglés, las tecnologías están en inglés, algunas de ellas todavía no han sido traducidas. Usted desea instalar software y para usted elegir el idioma hay cosas que no le permite solo le dice inglés. Entonces desde ahí, definitivamente la materia es una materia que en su ochenta por ciento es en inglés y desde aquí ellos ya sienten la dificultad de que al no saber inglés a ellos se les dificulta realmente desarrollarse académicamente.

3 - ¿Qué opinión tiene del por qué no se ha implementado la materia de inglés en la facultad de Ingeniería?
Explique:

Este tema ha sido muy discutido a nivel diseño curricular. Una de las razones que se alega o se justifica de que no se agrega como parte de la malla curricular es por motivos de que el inglés quita materias que son propias del que hacer como ingenieros y se considera que debe ser el estudiante por iniciativa propia que a la par de su carrera debe de estar aprendiendo inglés.

4 - Si se implementara la materia de inglés técnico en esta Facultad (Ingeniería), ¿Cuántos niveles considera necesario para el proceso de aprendizaje de los estudiantes?
Explique:

Para que realmente alguien de sistemas pueda desarrollarse bien tienen que ser mínimo cuatro asignaturas que estamos hablando de dos años porque a diferencia de otros, aquí, no solo basta que lo pueda leer; algunas veces hay que llenar ciertas formas, ciertos formatos que son en inglés y en muchos trabajos el ingeniero en sistemas tiene que hablar en inglés, entonces, él tiene que desarrollar lo que nosotros le llamamos el listening, el writing, el reading

verdad, y el speaking. Entonces por lo tanto no hay vuelta de hoja, el ingeniero en sistemas está obligado a saber inglés.

5 - ¿Qué estrategias cree usted que el estudiante utiliza para el aprendizaje del idioma inglés y sobrellevar la exigencia de la carrera?
Explique:

Generalmente lo que ellos hacen es utilizar el Google translator, es el traductor de Google. Como ellos pueden mucha tecnología, ellos encuentran muchas páginas que les pueden traducir los libros, el material verdad entre otros. Y eso realmente, pues, les facilita un poco pero muchas veces los traductores pierden el contexto de lo que están utilizando y por lo tanto a veces no logran comprender los conceptos técnicos o tecnologías que ellos están utilizando.

6 - ¿En qué año de la carrera considera usted que a los alumnos les es importante poseer conocimientos del idioma inglés?
Explique:

Desde el primer año porque esta carrera inminentemente los avances todos están en inglés desde el principio; por lo tanto, es una carrera que de hecho desde antes de venir debería de saber ya un poco. A nivel ya de tercer año se siente más la necesidad de saber inglés. Y a nivel de quinto año es mucho mayor porque ya son los avances tecnológicos y las tendencias de tecnología de punta entonces el estudiante, alguien de informática de hecho le digo hay algunos expertos en informática que dicen que un ingeniero de sistemas sin inglés puede considerarse ignorante porque tiene una desactualización de no menos de dos años en avances tecnológicos.

INTERVIEW: No 3

**UNIVERSIDAD DE EL SALVADOR
FACULTAD DE CIENCIAS Y HUMANIDADES
DEPARTAMENTO DE IDIOMAS EXTRANJEROS**

TEMA: *LIMITANTES DE LOS ESTUDIANTES DE INGENIERÍA EN SISTEMAS DEBIDO A LA AUSENCIA DEL IDIOMA INGLÉS EN LA MALLA CURRICULAR.*

Objetivo: Obtener información acerca de las limitaciones o dificultades que se enfrentan los estudiantes de Ingeniería en Sistemas de la Universidad de El Salvador al momento de requerir el uso de conocimientos del idioma inglés durante el proceso de enseñanza y aprendizaje a lo largo de la carrera.

Indicación: Lea con atención cada pregunta y responda con sus propias palabras cada una de ellas.

Nombre: Cesar Gonzales
Cargo desempeñado: Profesor universitario

1 - ¿Considera usted la materia de inglés importante en el proceso de aprendizaje de los estudiantes de la Facultad de Ingeniería?
Sí / No
¿Por qué?

La materia de inglés precisamente no pero si el conocimiento.

2 - ¿Ha encontrado dificultades en los alumnos para cursar la materia "Programación para dispositivos móviles" debido a que no poseen conocimientos del idioma inglés? ¿Cuáles?
Mencione:

Si, a los estudiantes se les dificulta hacer investigaciones sobre las últimas tecnologías ya que todo el material prácticamente viene en inglés.

3 - ¿Qué opinión tiene del por qué no se ha implementado la materia de inglés en la facultad de Ingeniería?
Explique:

Yo creo hay diferentes enfoques de la temática en inglés, verdad, entonces creo que la facultad ha tratado de que los docentes se especialicen en inglés

yendo a una capacitación con un colaborador que tiene la ingeniería eléctrica de apellido Fidel pero creo que no es suficiente y no cubre a los estudiantes entonces creo que es un problema de enfoque en como atacar el problema de la deficiencia de inglés.

4 - Si se implementara la materia de inglés técnico en esta Facultad (Ingeniería), ¿Cuántos niveles considera necesario para el proceso de aprendizaje de los estudiantes?
Explique:

*Bueno, tendría que ser una forma de evaluación primero de los niveles que cada uno trae y habría que incorporar una metodología similar a la que se da en **Ceniues** que hay unos niveles que dan desde el uno al veinte donde si hay un conocimiento bastante bueno podría lograrse con los estudiantes.*

5 - ¿Qué estrategias cree usted que el estudiante utiliza para el aprendizaje del idioma inglés y sobrellevar la exigencia de la carrera?
Explique:

Algunos se apoyan con herramientas como el google translator, o buscan a alguien que les traduzca, o simplemente buscan el material en español verdad de las mismas tecnologías que se utilizan. En realidad, no están buscando la capacitación en el área del idioma inglés sino que están buscando una salida para algo que les han pedido urgente, que es el problema que tenemos en general, no se está tocando o no se está tomando la medida de resolver el problema de forma directa y de forma integral.

6 - ¿En qué año de la carrera considera usted que a los alumnos les es importante poseer conocimientos del idioma inglés?
Explique:

Para mí desde tercer año debería de ser un poco… exigir algún nivel de conocimiento en idioma inglés. De hecho, yo estoy impartiendo materias de tercero y a veces de quinto año y hay una gran necesidad por lo que creería que en este año más se necesita.

INTERVIEW: No 4

TEMA: *LIMITANTES DE LOS ESTUDIANTES DE INGENIERÍA EN SISTEMAS DEBIDO A LA AUSENCIA DEL IDIOMA INGLÉS EN LA MALLA CURRICULAR.*

Objetivo: Obtener información acerca de las limitaciones o dificultades que se enfrentan los estudiantes de Ingeniería en Sistemas de la Universidad de El Salvador al momento de requerir el uso de conocimientos del idioma inglés durante el proceso de enseñanza y aprendizaje a lo largo de la carrera.

Indicación: Lea con atención cada pregunta y responda con sus propias palabras cada una de ellas.

Nombre: Boris Montano
Cargo desempeñado: Profesor universitario

1 - ¿Considera usted la materia de inglés importante en el proceso de aprendizaje de los estudiantes de la Facultad de Ingeniería?
Sí / No
¿Por qué?

A nivel profesional es importante el conocimiento de este idioma ya que en el campo laboral es demandado su conocimiento.

2 - ¿Ha encontrado dificultades en los alumnos para cursar la materia "Arquitectura en computadoras" debido a que no poseen conocimientos del idioma inglés?
Mencione:

Fíjese no, porque el material siempre lo traduzco, yo tengo unos libros que están en inglés lo que hago es traducir todas sus diapositivas y todo y muy pocas veces les doy material en inglés. Aunque si hay algún material que se requiere porque está en inglés es una de las dificultades que ellos me dicen porque estaba sondeando por lo menos en el curso de 100 estudiantes hay como 10 a 15 estudiantes que dominan el idioma. No es una limitante porque yo lo traduzco el material al español, aunque últimamente ya estoy poniendo el material y hasta los videos en inglés pero sí hay dificultad en ellos al no tener dominio del idioma inglés.

3 - ¿Qué opinión tiene del porque no se ha implementado la materia de inglés en la facultad de Ingeniería?
Explique:

Fíjese que no sé el por qué, pues nosotros si requerimos del idioma inglés porque la mayoría del material bueno, como ciencia la mayoría está en inglés, entonces son pocos los libros que logramos conseguir en español, pero no sé por qué no lo han implementado.

4 - Si se implementara la materia de inglés técnico en esta Facultad (Ingeniería), ¿Cuántos niveles considera necesario para el proceso de aprendizaje de los estudiantes?
Explique:

Si el inglés normal si lo ponemos así para aprenderlo más o menos 4 horas diarias mínimo debería tener unos 6 meses. Para inglés técnico no es posible que a los jóvenes se les imparta menos que eso y también es preferible que se les dé a ellos una o dos horas diarias para ponerlo manejar durante un año. Porque si es necesario la verdad, pero el tiempo sería 1 año dos horas diarias (dos ciclos dos horas diarias).

5 - ¿Qué estrategias considera usted que el estudiante utiliza para el aprendizaje del idioma inglés y sobrellevar las exigencias de la carrera?
Explique:

Por lo general ellos toman cursos aparte ya sea los sábados o los días de semana en horas de no estar acá. Otra cosa que he visto pero es poco utilizan alguna herramienta como internet (Duolingo) traductor de Google les ayuda a traducir material que les proporcionamos en inglés.

6 - ¿En qué año de la carrera considera usted que a los alumnos les es importante poseer conocimientos del idioma inglés?
Explique:

Siempre, lo que pasa que cuando ya llegan a las materias de tercer año y a ese nivel ya ellos deben saber bastante el idioma inglés, tienen ya que traducir textos más complejos técnicamente; entonces, considero que ellos ya deberían de tener un nivel bastante avanzado y tendrían que hacerse del conocimiento en los primeros años para que llegado al momento por ejemplo análisis numérico se les da todo el material en inglés, libros y folletos pero la clase se da en español. Yo en lo personal estoy pensando dar una unidad completamente en inglés para que vayan ya ellos también avanzando en el idioma inglés.

UNIVERSIDAD DE EL SALVADOR
FACULTAD DE CIENCIAS Y HUMANIDADES
DEPARTAMENTO DE IDIOMAS EXTRANJEROS

TEMA: *LIMITANTES DE LOS ESTUDIANTES DE INGENIERÍA EN SISTEMAS DEBIDO A LA AUSENCIA DEL IDIOMA INGLÉS EN LA MALLA CURRICULAR.*

Objetivo: Obtener información acerca de las limitaciones o dificultades que se enfrentan los estudiantes de Ingeniería en Sistemas de la Universidad de El Salvador al momento de requerir el uso de conocimientos del idioma inglés durante el proceso de enseñanza y aprendizaje a lo largo de la carrera.

Indicación: Lea con atención cada pregunta y responda con sus propias palabras cada una de ellas.

Nombre: Rudy Chicas
Cargo desempeñado: Profesor Universitario

1 - ¿Considera usted la materia de inglés importante en el proceso de aprendizaje de los estudiantes de la Facultad de Ingeniería?
Sí / No
¿Por qué?

Este tema aplica para todos los ámbitos de ingeniería. Como anécdota puedo compartir que los estudiantes me han dicho, ingeniero de este tema solo encuentro información en inglés y yo no sé inglés, lamentablemente no somos productores de tecnología y quienes producen la tecnología es en inglés. A nivel técnico los obligamos a que aprendan cierto nivel de inglés. Si definitivamente es importante este idioma en la carrera.

2 - ¿Ha encontrado dificultades en los alumnos para cursar la materia "Ingeniería de Software" debido a que no poseen conocimientos del idioma inglés?
Mencione:

Estudiantes exponen que solo hay material en inglés. Yo calculo que el 40 0 50% de los estudiantes para ellos representa una limitación bastante fuerte. Esta asignatura tengo 4 años de impartirla.

3 - ¿Qué opinión tiene del porque no se ha implementado la materia de inglés en la facultad de Ingeniería?
Explique:

Se ha debatido desde los orígenes de la carrera la inclusión de la materia de inglés y el problema es esa disyuntiva que uno se enfrenta en la que sabiendo que no solo puede agregarse una sola asignatura sino deben agregarse más materias relacionadas , y ese espacio en el plan de estudio las unidades valorativas tendrán que ser ocupadas por esas materias de inglés probablemente presente no cubrir otro contenido propio de la carrera y hasta ahora lo que se ha hecho es elegir mejor el contenido de la carrera que reforzar el nivel de inglés. Les comentaba que en el plan de estudio nuevo si se tiene planeado en algunas asignaturas claves pedir como requisito un nivel de inglés. La facultad también está trabajando en condiciones para q los alumnos aprendan cursos adicionales y complementarios porque estamos conscientes de la importancia que tiene.

4 - Si se implementara la materia de inglés técnico en esta Facultad (Ingeniería), ¿Cuántos niveles considera necesario para el proceso de aprendizaje de los estudiantes?
Explique:

Yo creo que una asignatura no es suficiente, es imposible. Por ejemplo: Un estudiante que venga de un instituto público y que no domine el idioma llegue a un nivel suficientemente bueno, aunque sea nivel técnico del idioma. Yo considero tres niveles son necesarios porque también depende del grado o nivel que el estudiante tenga, por ello tiendo a pensar que requerirá de tres niveles.

5 - ¿Qué estrategias considera usted que el estudiante utiliza para el aprendizaje del idioma inglés y sobrellevar las exigencias de la carrera?
Explique:

Digamos que estas generaciones tienen la ventaja de la tecnología, muchos no están pensando en esforzarse por aprender el idioma básicamente usan traductores y luego ven cómo lidiar con la traducción algunos tienen un nivel bastante aceptable y hay un 35% que en el camino empieza a aprender. Muchos estudiantes buscan el curso que la facultad imparte y ahí empiezan a aprender mediante cursos libres de inglés, lo imparte un maestro de Estados Unidos. Por otra parte, la facultad hace 3 años empezó un curso en línea de inglés dirigido a los estudiantes de la facultad precisamente, otros a su vez buscan academias particulares.

6 - ¿En qué año de la carrera considera usted que a los alumnos les es importante poseer conocimientos del idioma inglés?
Explique:

Yo diría que a partir del tercer año, ya que se volvería indispensable pero sí tendría que decir un año en específico diría el cuarto año ya que comienzan a llevar materias electivas y éstas tienden a ser más técnicas y es ahí donde se enfrenta que algunos temas no se encuentran disponibles en español (metodologías de desarrollo de software, marcos de trabajo de arquitecturas).

ANNEXES

GLOSSARY

↓ Term	↓ Definition
System Engineering:	Systems engineering (SE) is an interdisciplinary area of endeavor whose focus is the development of complex technological systems with reference to their extended environment. Software engineering encompasses the design, development, and maintenance of complex systems with consideration to their software and hardware, their interconnections, and the environments in which they operate over the course of their life cycle and ultimate decommissioning. Retrieved on August 11, 2020 from: https://whatis.techtarget.com/definition/systems-engineering-SE
Quantitative research	Quantitative research is "explaining phenomena by collecting numerical data that are analysed using mathematically based methods (in particular statistics)." (Aliaga and Gunderson 'Interactive Statistics '3rd Edition, 2005: 26)
Qualitative research	Qualitative research seeks to answer questions about why and how people behave in the way that they do. It provides in-depth information about human behaviour. (Aliaga and Gunderson 'Interactive Statistics' 3rd Edition, 2005: 28)
Inductive research	Inductive approach, also known in inductive reasoning, starts with the observations and theories are proposed towards the end of the research process because of observations [1]. Inductive research "involves the search for pattern from observation and the development of explanations – theories – for those patterns through series of hypotheses" [2]. No theories or hypotheses would apply in inductive studies at the beginning of the research and the researcher is free in terms of altering the direction for the study after the research process had commenced. It is important to stress that inductive approach does not imply disregarding theories when formulating research questions and objectives. This approach aims to generate meanings from the data set collected in order to identify patterns and relationships to build a theory; however, inductive approach does not prevent the researcher from using existing theory to formulate the research question to be explored.[3] Inductive reasoning is based on learning from experience. Patterns, resemblances, and regularities in experience

	(premises) are observed to reach conclusions (or to generate theory). (Lodico, M.G., Spaulding, D.T & Voegtle, K.H. (2010) "Methods in Educational Research: From Theory to Practice" John Wiley & Sons, p.10)
Second language	A language learned by a person after his or her native language, especially as a resident of an area where it is in general use. A language widely used, especially in educational and governmental functions in a region where all or most of its speakers are nonnative, as English in India or Nigeria. Retrieved on August 19, 2020 from: https://www.dictionary.com/browse/second-language
National Academy of Engineering	The National Academy of Engineering (NAE) is an American nonprofit, non-governmental organization. The National Academy of Engineering is part of the National Academies of Sciences, Engineering, and Medicine, along with the National Academy of Sciences (NAS), the National Academy of Medicine, and the National Research Council. The NAE operates engineering programs aimed at meeting national needs, encourages education and research, and recognizes the superior achievements of engineers. New members are annually elected by current members, based on their distinguished and continuing achievements in original research. The NAE is autonomous in its administration and in the selection of its members, sharing with the rest of the National Academies the role of advising the federal government. Retrieved on August 20, 2020 from: https://en.wikipedia.org/wiki/National_Academy_of_Engineering
Software	Software, in its most general sense, is a set of instructions or programs instructing a computer to do specific tasks. Software is a generic term used to describe computer programs that run on PCs, mobile phones, tablets, or other smart devices. Software is often used to describe all the functional aspects of a computer that do not refer to its physical components (hardware). Scripts, applications, programs, and a set of instructions are all terms often used to describe software. Everything that "runs" on a computer, from an operating system, to a diagnostic tool, video game, or app can be defined as software. (Linda Crane (2008) "COMPUTER HARDWARE AND SOFTWARE" p.4)

hardware	Refers to objects that you can touch, like disks, disk drives, display screens, keyboards, printers, boards, and chips. (Linda Crane (2008) "COMPUTER HARDWARE AND SOFTWARE" p.5)
EF English Proficiency Index	The EF English Level for Schools Index (EF EPI-s). A study that analyzes the acquisition of English skills in high school and high school students. Retrieved on August 21, 2020 from: https://www.ef.com/wwen/epi/
George Steiner	Francis George Steiner, FBA (April 23, 1929 – February 3, 2020) was a Franco-American literary critic, essayist, philosopher, novelist, and educator. He wrote extensively about the relationship between language, literature and society, and the impact of the Holocaust. An article in The Guardian described Steiner as a "polyglot and polymath". Among his admirers, Steiner is ranked "among the great minds in today's literary world". English novelist A. S. Byatt described him as a "late, late, late Renaissance man ... a European metaphysician with an instinct for the driving ideas of our time". Harriet Harvey-Wood, a former literature director of the British Council, described him as a "magnificent lecturer – prophetic and doom-laden [who would] turn up with half a page of scribbled notes, and never refer to them". Steiner was Professor of English and Comparative Literature at the University of Geneva (1974–94), Professor of Comparative Literature and Fellow at the University of Oxford (1994–95), Professor of Poetry at Harvard University (2001–02), and an Extraordinary Fellow at Churchill College, Cambridge (since 1969). Retrieved on August 22, 2020 from https://en.wikipedia.org/wiki/George_Steiner
FIA	FIA is the abbreviation for Facultad de Ingeniería y Arquitectura, which as an integral part of the University of El Salvador, is a training institution for competent, responsible and ethical professionals in the areas of engineering and architecture; generator of alternative solutions to huge national problems in its areas of competence, promoting technological, scientific, social, cultural and economic development; also promoter of the link with the productive and social sectors, both public and private, as well as national and international. Retrieved on August 23, 2020 from: http://www.fia.ues.edu.sv/

INSTRUMENTS
QUESTIONNAIRE MODEL

UNIVERSIDAD DE EL SALVADOR
FACULTAD DE CIENCIAS Y HUMANIDADES
DEPARTAMENTO DE IDIOMAS EXTRANJEROS

TEMA: *LIMITANTES DE LOS ESTUDIANTES DE INGENIERÍA EN SISTEMAS DEBIDO A LA AUSENCIA DEL IDIOMA INGLÉS EN LA MALLA CURRICULAR.*

Objetivo: Obtener información acerca de las limitaciones o dificultades que enfrentan los estudiantes de Ingeniería en Sistemas de la Universidad de El Salvador al momento de requerir el uso de conocimientos del idioma inglés durante el proceso de enseñanza y aprendizaje a lo largo de la carrera.

Indicaciones: Lea las siguientes preguntas cuidadosamente y circule la respuesta que considere acorde a su opinión y conteste las preguntas donde se requiera una respuesta abierta. Sea lo más sincero posible, la información obtenida con estas encuestas será tratada bajo confidencialidad y de uso exclusivo para esta investigación.

INFORMACIÓN GENERAL

> **Edad:** ___ Años
>
> **Género:** Masculino 1. Femenino 2.

PARTE I
Conocimiento del idioma inglés

1 - ¿Has tomado clases de inglés?
a) Sí   b) No

2 - Si tu respuesta fue sí ¿Dónde has tomado las clases?
a) CENIUES
b) Academia Europea
c) Pro-lingua
d) Centro Cultural Salvadoreño
e) English for Call Centers
f) Cursos libres ofrecidos por la FIA
g) Otros. Especifique: _____

3 - ¿Cual consideras que es el nivel de inglés que posees?

a) Nulo   b) Principiante   c) Básico   d) Intermedio   e) Avanzado

4 - ¿Conoces los cursos en línea que ofrece la FIA?

a) Sí   b) No

5 - ¿Cuán beneficiosos consideras que son los cursos ofrecidos por la FIA?

a) Nada   b) Poco   c) Más o menos   d) Mucho

PARTE II
El uso del idioma inglés en clases

6 - ¿Ha enfrentado alguna dificultad en la carrera de Ingeniería en Sistemas por la ausencia de materias en inglés en la malla curricular?

a) Sí   b) No

Si su respuesta es SÍ pase a la pregunta 7 y 8, si su respuesta es No siga con la pregunta 9

7 – ¿En qué materia(s) considera usted ha sido requerido más conocimientos de inglés? *(Puede elegir más de una opción)*

a) Programación I, II, III
b) Manejo de Software para microcomputadoras
c) Estructuras de Datos
d) Sistemas Digitales
e) Sistemas y Procedimientos
f) Diseño de Sistemas II
g) Sistemas Operativos
h) Otros. Especifique: _____

8 – ¿A qué tipo de dificultades o limitantes como estudiante se ha enfrentado al momento de cursar alguna materia donde se requiera conocimientos de inglés?

a) Perdido totalmente al momento de seguir procedimientos e instrucciones
b) Incapacidad de entender la mayor parte de la información
c) Mala interpretación de la información
d) Requiero ayuda de otras personas que sepan inglés para realizar mis actividades
e) Se me complica entender la información sin el uso de traductores en línea
f) He reprobado la materia
g) Todas las anteriores
h) Otras limitantes. Especifique: _____

9 - ¿Consideras importante la integración de la materia de inglés en la carrera de Ingeniería en Sistemas?

a) Sí   b) No

Explique:_____

_____

_____

_____

10 - ¿Qué nivel de inglés considera que se requiere en la carrera de Ingeniería en Sistemas?

a) Ninguno
b) Básico
c) Intermedio
d) Avanzado

PARTE III
Tareas y Actividades

11 – A la hora de realizar tareas o actividades en su carrera de Ingeniería en Sistemas ¿Consulta o suele consultar libros, videos o sitios web con información en inglés?

a) Sí   b) No

Si su respuesta es SÍ pase a la pregunta 12, si su respuesta es NO continúe con la pregunta 13 en adelante.

12 – ¿Cómo hace un estudiante de ingeniería en sistemas para entender información escrita en inglés necesaria para el desarrollo de actividades académicas?

Explique:

_____

_____

_____

_____

13 - ¿En una escala del 0 - 10. ¿Qué importancia le da al idioma inglés para el desarrollo de tareas y actividades dentro de la carrera en ingeniería en sistemas?

Menos importante   Más importante

0   1   2   3   4   5   6   7   8   9   10

14 - ¿Considera usted que al no incluir materias en inglés en la carrera de ingeniería en sistemas, limita a estudiantes a buscar información asociada a tareas o actividades asignadas en algunas materias de la carrera y por lo tanto el estudiante mejor se basa en información en español?

a) Sí   b) No

15 - En la actualidad, dentro de la web y la tecnología, según su opinión. ¿En qué idioma es mayormente hallada la información para el desarrollo de clases, actividades o tareas dentro de la ingeniería en sistemas?

a) Inglés   b) Español   c) Francés   d) Otro. Especifique: _____

UNIVERSIDAD DE EL SALVADOR
FACULTAD DE CIENCIAS Y HUMANIDADES
DEPARTAMENTO DE IDIOMAS EXTRANJEROS
TEMA: *LIMITANTES DE LOS ESTUDIANTES DE INGENIERÍA EN SISTEMAS DEBIDO A LA AUSENCIA DEL IDIOMA INGLÉS EN LA MALLA CURRICULAR.*

Objetivo: Obtener información acerca de las limitaciones o dificultades que se enfrentan los estudiantes de Ingeniería en Sistemas de la Universidad de El Salvador al momento de requerir el uso de conocimientos del idioma inglés durante el proceso de enseñanza y aprendizaje a lo largo de la carrera.

Indicación: lea con atención cada pregunta y responda con sus propias palabras cada una de ellas.

Nombre: _____

Cargo desempeñado: _____

1 ¿Considera usted la materia inglés importante en el proceso de aprendizaje de los estudiantes de la Facultad de Ingeniería?

     Sí / No

     ¿Por qué?

_____

2 - ¿Ha encontrado dificultades en los alumnos para cursar la materia debido a que no poseen conocimientos del idioma inglés? ¿Cuáles?

     Mencione:

_____

3. ¿Qué opinión tiene del por qué no se ha implementado la materia de inglés en la facultad de Ingeniería?

     Explique:

_____

4. Si se implementara la materia de inglés técnico en esta Facultad (Ingeniería), ¿Cuántos niveles considera necesario para el proceso de aprendizaje de los estudiantes?

     Explique:

_____

5 ¿Qué estrategias considera usted que el estudiante utiliza para el aprendizaje del idioma inglés y sobrellevar las exigencias de la carrera?

     Explique:

_____

6 ¿En qué año de la carrera considera usted que a los alumnos se les es importante poseer conocimientos del idioma inglés?

     Explique:

_____

UNIVERSIDAD DE EL SALVADOR
FACULTAD DE INGENIERÍA Y ARQUITECTURA
CARRERA: INGENIERÍA DE SISTEMAS INFORMÁTICOS
PLAN DE ESTUDIOS 1998

I	II	III	IV	V	VI	VII	VIII	IX	X	XI
1 · 4 · MTE115 · Métodos Experimentales · B	5 · 4 · FIR115 · Física I · 1,2	10 · 4 · FIR215 · Física II · 5,6	15 · 4 · FIR315 · Física III · 10	20 · 4 · SDU115 · Sistemas Digitales · 7,15	25 · 4 · Técnica Electiva I	30 · 4 · MIP115 · Microprogramación · 26	35 · 4 · COS115 · Comunicaciones I · 30	40 · 4 · LPR115 · Legislación Profesional · 120 U.V.	45 · 4 · CPR115 · Consultoría Profesional · 150 U.V.	TRABAJO DE GRADUACION
2 · 4 · MAT115 · Matemática I · B	6 · 4 · MAT215 · Matemática II · 2	11 · 4 · MAT315 · Matemática III · 6	16 · 4 · MAT415 · Matemática IV · 11	21 · 4 · ANS115 · Análisis Numérico · 7,16	26 · 4 · ARC115 · Arquitectura de Computadoras · 20,21	31 · 4 · Técnica Electiva II	36 · 4 · SIO115 · Sistemas Operativos · 30	41 · 4 · RHU115 · Recursos Humanos · 32	46 · 4 · ACC115 · Administración de Centros de Cómputo · 41,42,43	
3 · 4 · IAI115 · Introducción a la Informática · B	7 · 4 · PRN115 · Programación I · 3	12 · 4 · PRN215 · Programación II · 7	17 · 4 · ESD115 · Estructura de Datos · 12	22 · 4 · HDP115 · Herramientas de Productividad · 8,17	27 · 4 · SIC115 · Sistemas Contables · 22	32 · 4 · TAD115 · Teoría Administrativa · 27	37 · 4 · ANF115 · Análisis Financiero · 28,32	42 · 4 · BAD115 · Bases de Datos · 36,38	47 · 4 · API115 · Administración de Proyectos Informáticos · 37,43	
4 · 4 · PSI115 · Psicología Social · B	8 · 4 · MSM115 · Manejo de Software para Microcomputadoras · 3	13 · 4 · PYE115 · Probabilidad y Estadística · 6	18 · 4 · PRN315 · Programación III · 12	23 · 4 · SYP115 · Sistemas y Procedimientos · 18	28 · 4 · IEC115 · Ingeniería Económica · 13	33 · 4 · DSI115 · Diseño de Sistemas I · 27,29	38 · 4 · DSI215 · Diseño de Sistemas II · 33	43 · 4 · SGI115 · Sistemas de Información Gerencial · 38	48 · 4 · Técnica Electiva V	
	9 · 4 · HSE115 · Historia Social y Económica de El Salvador y C.A. · 4	14 · 4 · FDE115 · Fundamentos de Economía · 6,9	19 · 4 · MEP115 · Métodos Probabilísticos · 13	24 · 4 · MOP115 · Métodos de Optimización · 19	29 · 4 · TSI115 · Teoría de Sistemas · 23	34 · 4 · Técnica Electiva III	39 · 4 · Técnica Electiva IV	44 · 4 · Técnica Electiva IV		

Leyenda:

NC	UV
C	
NA	
p	

- NC = número correlativo
- UV = unidades valorativas
- NA = nombre de asignatura
- p = prerequisito
- C = código
- B = Bachillerato.

TOTAL DE MATERIAS: 48

TOTAL DE UNIDADES VALORATIVAS DEL PLAN: 192 U.V

LISTA DE LAS MATERIAS ELECTIVAS (OPTATIVAS) POR CICLO. DETALLAR AL REVERSO.

ACUERDO DE CONSEJO SUPERIOR UNIVERSITARIO: 117-95-99 (VI- a) 30/julio/1998

UNIVERSIDAD DR. ANDRÉS BELLO

PLAN DE ESTUDIOS 2016
PENSUM DE LA CARRERA DE INGENIERÍA EN SISTEMAS Y COMPUTACIÓN

Ciclo	Código	Asignatura	Pre-Requisito	U.V.
1	MAT1-13	Matemática	Bachillerato	4
1	ING1-05	Inglés II	Bachillerato	4
1	FP-64	Fundamentos de Programación	Bachillerato	4
1	TCO1-02	Teoría Concreta I	Bachillerato	4
1	OTI-122	Orientación Técnica de Ingeniería	Bachillerato	4
2	MAT2-17	Matemática II	MAT1-13	4
2	ING2-06	Inglés III	ING1-05	4
2	PROO-109	Programación Orientada a Objetos	FP-64	4
2	SUT-73	Software Utilitario	Bachillerato	4
2	BDD1-67	Base de Datos I	FP-64	4
3	MAT3-123	Matemáticas III	MAT2-17	4
3	FYFP-36	Filosofía y Ética Profesional	Bachillerato	4
3	PRG1-65	Programación I	PROO-109	4
3	AYD-70	Análisis y Diseño de Sistemas	BDD1-67	4
3	BDD2-124	Base de Datos II	BDD1-67	4
4	MAT4-125	Matemáticas IV	MAT3-123	4
4	FIS1-126	Física I	MAT2-17	4
4	PRGII-03	Programación II	PRG1-65	4
4	SO1-69	Sistemas Operativos I	Bachillerato	4
4	PGE-04	Principios Generales de Economía	Bachillerato	4
5	MAF-31	Matemática Financiera	MAT2-17	4
5	FIS2-127	Física II	FIS1-126	4
5	PRGIII-71	Programación III	PRGII-03	4
5	SO2-72	Sistemas Operativos II	SO1-69	4
5	REDI-79	Redes I	Bachillerato	4
6	SIG-83	Sistemas de Información Gerencial	AYD-70	4
6	FIS3-129	Física III	FIS2-127	4
6	PRG4-124	Programación IV	PRGIII-71	4
6	FEE-66	Fundamentos de Electricidad y Electrónica	Bachillerato	4
6	REDII-81	Redes II	REDI-79	4
6	MDC-74	Mantenimiento de Computadoras	FEE-66	4
7	TPIS-131	Técnicas de Producción Industriales de Software	SIG-83	4
7	EDI-132	Estándares de Información	SIG-83	4
7	SD-133	Sistemas Digitales	FEE-66	4
7	EST1-21	Estadística I	MAT1-13	4
8	TCS-134	Tópicos de Calidad de Software	TPIS-131	4
8	PG-08	Psicología General	Bachillerato	4
8	DT-115	Dibujo Técnico	Bachillerato	4
8	ACC-64	Administración de Centro de Cómputo	SIG-83	4
9	SE-135	Sistemas Expertos	TCS-134	4
9	AS-85	Auditoría de Sistemas	SIG-83	4
9	DA-137	Dibujo Aplicado	DT-115	4
9	IG-01	Introducción a la Informática	Bachillerato	2
10	FYEP-44	Formulación y Evaluación de Proyectos	169 U's	4
10	CDICT-130	Gestión Gerencial de la Innovación, Investigación y Tecnología	169 U's	4
10	CD-07	Seminario de Graduación	169 U's	4
		Total De Unidades Valorativas		**185**

UNIVERSIDAD PEDAGÓGICA DE EL SALVADOR "DR. LUIS ALONSO APARICIO"
PLAN DE ESTUDIOS DE INGENIERÍA EN SISTEMAS Y COMPUTACIÓN
Año 2018 - 2022

PROCESO DE GRADUACIÓN

CICLO I	CICLO II	CICLO III	CICLO IV	CICLO V	CICLO VI	CICLO VII	CICLO VIII	CICLO IX	CICLO X
FILOSOFÍA Y ÉTICA PROFESIONAL	GESTIÓN DE REDES I	GESTIÓN DE REDES II	SEGURIDAD DE REDES	PROGRAMACIÓN PARA MÓVILES	SISTEMAS OPERATIVOS	ANÁLISIS Y DISEÑO DE SISTEMAS	ADMINISTRACIÓN DE LAS TECNOLOGÍAS DE LA INFORMACIÓN	TELECOMUNICACIÓN	ROBÓTICA
MATEMÁTICA I	MATEMÁTICA II	MATEMÁTICA III	MATEMÁTICA IV	DISEÑO WEB	DESARROLLO DE APLICACIONES PARA INTERNET	INGENIERÍA DE SOFTWARE	AUDITORÍA DE SISTEMAS	SISTEMA DE INFORMACIÓN GERENCIAL	INFRAESTRUCTURA Y CÓMPUTO EN LA NUBE
LÓGICA COMPUTACIONAL	PROGRAMACIÓN I	PROGRAMACIÓN II	PROGRAMACIÓN III	BASE DE DATOS I	BASE DE DATOS II	SISTEMAS DIGITALES	MANTENIMIENTO DE COMPUTADORAS	FORMULACIÓN Y EVALUACIÓN DE PROYECTOS DE INGENIERÍA	INTELIGENCIA DE NEGOCIOS
INGLÉS TÉCNICO I	FÍSICA I	FÍSICA II	FÍSICA III	GESTIÓN DEL TALENTO HUMANO	CONTABILIDAD FINANCIERA	PROGRAMACIÓN APLICADA I	INGLÉS TÉCNICO II	SEMINARIO DE PROBLEMAS SOCIALES, CULTURALES Y AMBIENTALES	DESARROLLO DE EMPRENDEDORES
DERECHOS HUMANOS	QUÍMICA GENERAL	MECÁNICA DE SÓLIDOS	ESTADÍSTICA I		ELECTRÓNICA		TÉCNICAS DE REDACCIÓN		

ASIGNATURAS DE CICLO EXTRAORDINARIO

INGLÉS TÉCNICO I	INGLÉS TÉCNICO II
SEMINARIO DE PROBLEMAS SOCIALES, CULTURALES Y AMBIENTALES	
TÉCNICAS DE REDACCIÓN	

Proceso de Graduación: es el conjunto de actividades académicas que desarrolla el egresado, de acuerdo con el requisito expresado en el plan de estudio.

Leyenda:
- Nombre de la Materia
- Prerrequisito
- UV:

Ingeniería Informática
Plan 2018

Leyenda de cada casilla: Número correlativo · Código · Nombre de la Asignatura · Prerrequisito · UV

Nº	Código	Asignatura	Prerrequisito	UV
Ciclo I				
1	010180	Pre cálculo	Bachillerato	4
2		Optativa técnica I	Bachillerato	4
3	010142	Matemática discreta I	Bachillerato	3
4	190153	Fundamentos de programación	Bachillerato	4
Ciclo II				
5	010112	Álgebra vectorial y matrices	1	4
6	010181	Cálculo I	1	4
7	190154	Programación de estructuras dinámicas	3, 4	4
8	010143	Matemática discreta II	3	3
Ciclo III				
9	200068	Física I	5, 6	5
10	010182	Cálculo II	5, 6	4
11	190175	Programación orientada a objetos	7	4
12	190155	Bases de datos	7	4
Ciclo IV				
13	200084	Electricidad y magnetismo	9, 10	5
14	010183	Cálculo III	10	4
15	190156	Programación web	11	4
16	190157	Administración de bases de datos	12	4
17		Optativa humanístico-social I	Bachillerato	3
Ciclo V				
18	010141	Análisis numérico	14	4
19	190158	Redes de computadoras	14	4
20	190159	Programación de dispositivos móviles	15	4
21	190160	Análisis de sistemas	15	3
22	200069	Física II	9, 10	5
Ciclo VI				
23		Optativa humanístico-social II	Bachillerato	3
24	190161	Análisis de algoritmos	8	4
25	190162	Programación de artefactos	13, 15	4
26	010118	Probabilidad y estadística	14	4
27	190163	Seguridad en entornos de desarrollo	8, 16	4
Ciclo VII				
28	190065	Arquitectura de computadoras	13	4
29	190164	Técnicas de simulación en computadoras	26	4
30	190165	Programación n-capas	25	4
31	190176	Fundamentos de inteligencia de negocios	16	4
32		Optativa humanístico-social III	Bachillerato	3
Ciclo VIII				
33	190166	Sistemas operativos	28	4
34	190167	Programación declarativa	24	4
35	190168	Ingeniería de software	15	4
36	250055	Formulación y evaluación de proyectos	31	4
Ciclo IX				
37		Optativa humanístico-social IV	Bachillerato	3
38		Optativa técnica II		4
39	190169	Aplicaciones código abierto	35	4
40	190170	Práctica profesional I	36	4
Ciclo X				
41		Optativa técnica III		4
42	190171	Teoría de lenguajes de programación	24	4
43		Optativa humanístico-social V	Bachillerato	3
44	190172	Práctica profesional II	40	4

UNIVERSIDAD EVANGÉLICA DE EL SALVADOR

FACULTAD DE INGENIERÍAS
FLUJOGRAMA DEL PLAN DE ESTUDIOS DE LA CARRERA
INGENIERÍA EN SISTEMAS COMPUTACIONALES 2013

UNIVERSIDAD EVANGÉLICA DE EL SALVADOR

#	Código	Materia	Prerrequisito	UV
	CICLO 1			
1	FCD	FUNDAMENTOS DE COMPUTACION	BACHILLERATO	3
2	ALC	ALGORITMOS Y LOGICA COMPUTACIONAL	BACHILLERATO	3
3	MAT I	MATEMÁTICA I	BACHILLERATO	4
4	SOP	SISTEMAS OPERATIVOS	BACHILLERATO	3
5	ETI	ÉTICA	BACHILLERATO	3
	CICLO 2			
6	PRG 1	PROGRAMACIÓN I	ALC	4
7	FBD	FUNDAMENTOS DE BASE DE DATOS	SOP	4
8	MAT II	MATEMÁTICA II	MAT I	4
9	FIS 1	FÍSICA I	MAT I	3
10	ING	INGLÉS	BACHILLERATO	3
	CICLO 1			
11	PRG II	PROGRAMACIÓN II	PRG I	4
12	ABD	ADMINISTRACION DE BASE DE DATOS	FBD	4
13	MAT III	MATEMÁTICA III	MAT II	4
14	FIS II	FÍSICA II	FIS I	3
15	ITEC	INGLÉS TECNICO	ING	3
	CICLO 2			
16	PRG III	PROGRAMACIÓN III	PRG II	4
17	ADS	ANALISIS DE SISTEMAS	ABD	4
18	MAT IV	MATEMÁTICA IV	MAT III	4
19	FIS III	FÍSICA III	FIS II	3
20	DTD	DIBUJO TECNICO DIGITAL	ITEC	3
	CICLO 1			
21	RDS	REDES	ADS	4
22	FDC	FUNDAMENTOS DE CONTABILIDAD	MAT II	3
23	INW	INGENIERIA DE LA WEB	PRG III	4
24	ARC	ARQUITECTURA DE COMPUTADORAS	FCD	3
25	SOG	SOCIOLOGIA GENERAL	BACHILLERATO	3
	CICLO 2			
26	ARW	ADMINISTRACION DE REDES WINDOWS	RDS	4
27	INS	INGENIERIA DE SOFTWARE	ADS	4
28	EYP	ESTADISTICA Y PROBABILIDAD	MAT IV	4
29	ELD	ELECTRONICA DIGITAL	FET	3
30	MDI I	METODOLOGIA DE LA INVESTIGACION I	SOG	4
	CICLO 1			
31	ARL	ADMINISTRACION DE REDES LINUX	RDS	4
32	ESD	ESTRUCTURA DE DATOS	PRG III	4
33	SOC	SEGURIDAD OCUPACIONAL	SOG	3
34	ETP	ÉTICA PROFESIONAL	ETI	3
35	FET	FUNDAMENTOS DE ELECTRONICA	FIS III	4
	CICLO 2			
36	SIE	SISTEMAS EXPERTOS	ESD	4
37	DET	DIMENSION ESTRATEGICA DE LAS TIC	INS	4
38	MDI II	METODOLOGIA DE LA INVESTIGACION II	MDI I	4
39	PPE I	PRACTICA PROFESIONAL I	INS	4
40	EMP	EMPRENDEDURISMO	FDC	3
	CICLO 1			
41	AUS	AUDITORIA DE SISTEMAS	DET	4
42	CEL	COMERCIO ELECTRONICO	INW	4
43	SIG	SISTEMAS DE INFORMACION GERENCIAL	MDI II	4
44	PPE II	PRACTICA PROFESIONAL II	PPE I	4
45	PST	PSICOLOGIA DEL TRABAJO	SOG	3
	CICLO 2			
46	FEP	FORMULACION Y EVALUACION DE PROYECTOS	SIG	3
47	ION	INTELIGENCIA DE NEGOCIOS	SIG	4
48	GTI	GESTION Y TECNOLOGIA DE LA INFORMACION	DET	4
45	PPE III	PRACTICA PROFESIONAL III	PPE II	4

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