

12<sup>th</sup> Grade Graduation Project: Rochester School's Little Dictionary

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Author Note

A brief author note (which should be omitted in Paul Rose's courses) goes here. This note may include acknowledgment of funding sources, expressions of gratitude to research assistants, and contact information for the author who will handle requests. I have a few notes of my own to share. First, thanks to everyone who has suggested improvements; I'm sorry I can't acknowledge you all here. If anyone else badly needs to email me, try searching with "paul rose siue". Second, you are hereby granted permission to use (and adapt) this document for learning and research purposes. You may not sell this document either by itself or in combination with other products or services. Third, if you use this document, you use it at your own risk. The document's accuracy and safety have been thoroughly evaluated, but they are not guaranteed. Fourth, if you find this document helpful, I would be grateful if you would click on this URL: <http://goo.gl/DGHoZ>. It directs to a harmless Department of Psychology web page at SIUE, and records click-through data that give me an idea of how many people have found this document helpful.

## Index

<b>Chapter I .....</b>	<b>5</b>
<b>Chosen Career.....</b>	<b>6</b>
<b>How I got there. ....</b>	<b>7</b>
<b><i>Test 1: Personality Test .....</i></b>	<b><i>7</i></b>
Types Definitions .....	8
Extroverted vs Introverted .....	8
Sensing vs Intuitive .....	9
Thinking vs Feeling .....	10
Judging vs Perceiving .....	11
Personality Type .....	12
<b><i>Test 2: Basic Needs Profile.....</i></b>	<b><i>13</i></b>
<b><i>Test 3: “Batería de Aptitudes Diferenciales y Generales” (BADyG) .....</i></b>	<b><i>16</i></b>
<b><i>Test 4: “Análisis Aptitudinal y Profesional” (PPS).....</i></b>	<b><i>18</i></b>
<b><i>Test 5: Thuoper Betesa .....</i></b>	<b><i>19</i></b>

### Abstract

In this document, you will find the development of my Rochester School's Little Dictionary degree project, worked during twelfth grade. This document tries to solve a common problem of the students at Rochester School, that each year have had difficulties to look for the necessary information to understand the given subjects. This problem arises from the difficulties in the diffusion of information from all sources towards the students and this document exposes is explained my approximation to a possible solution. Here, you will see how this project has evolved through the four phases presented in the article " Sistema de Realización de un Proyecto " (Aljure, 2009). In the first chapter I explain what my ideal image is: the desired future for the project, together with the activities that made me chose this project as my final product. In the second part, I analyze the current situation of the moment in which I began the project. In the third chapter, I compare these two images: that of my visualization of the future with that of the present moment. In the fourth chapter, I formulate a specific action plan to bring the current situation closer to the desired future. Finally, in the fifth phase, we will see the results of this application. Also, I include here the surveys used and all the studies carried out.

*Keywords:* Database, Degree Project, Information, Leadership, Technology

### Resumen

En este documento, encontrarán el desarrollo de mi proyecto de grado *Rochester School's Little Dictionary*, trabajado durante grado undécimo. Este intenta solucionar un problema común de los estudiantes, los cuales cada año se hayan con dificultades de buscar la información necesaria para entender los temas dados, por la difusión de la información y aquí se encuentra explicado una aproximación propia a la solución. A continuación, verán cómo este proyecto fue evolucionando a través de las cuatro fases presentadas en el artículo "Sistema de Realización de un Proyecto" (Aljure, 2009). En el primer capítulo expongo cuál es mi imagen ideal: el futuro deseado para el proyecto, junto con las actividades que hicieron que llegara a este proyecto. En la segunda parte, analizo la situación actual del proyecto a la hora de comenzar. En el tercer capítulo, comparo estas dos imágenes: aquella de mi visualización del futuro con la del presente de ese momento. En el cuarto capítulo formuló un plan de acción específico para poder acercar más la situación actual con el futuro deseado. Finalmente, en la quinta fase, vemos los resultados de esta aplicación. Así mismo, incluyo aquí las encuestas empleadas y todos los estudios realizados.

*Palabras Clave:* Base de Datos, Información, Liderazgo, Proyecto de Grado, Tecnología

### 12<sup>th</sup> Grade Graduation Project: Rochester School's Little Dictionary

At Rochester School, there is a way for senior students to change and lead the changes they want to see in their immediate reality. This is what my community calls a project: to drive improvement you want to see. And this is the first challenge that I will face, because, although everything we see in the progress of mankind are the materializing ideas due to projects, it is not easy to decide and to implement them in a meaningful way, that will fulfil our wishes and also be useful for others and help the context. But in order to be able to do it, we can take into account the four steps described by Juan Pablo Aljure's "Sistema de Realización de un Proyecto" (Aljure, 2009) which have a very strong relationship with WDEP (Wishes, Doing, Evaluating, Planning) and are the ones I will take to make a change my personal community. I will also be using everything I have learned during my life at school, making easier the planning, organization and implementation of my idea to change my world.

## Chapter I

Phase I is all about the Wishes related to my project. In it I think about the goal I want to achieve, what I dream the future could be and what I would like, without forgetting that I live in a system, and that both others and my context are essential for the change to occur, because they are the ones, I am working for. As Juan Pablo says in the first phrase referencing Deming, "First, we need to start with the end", which means the most important thing for a project is all about thinking about the final product, the change we want, the goal we desire. This means, a specific and detailed description of what we imagine for the future; how we imagine the school would be once the project is accomplish. We are supposed to let our imagination fly, we are supposed to think in a limitless scenario so that we start from our ideal and perfect project.

**Chosen Career**

In this phase I focus on the future and how I picture it. But for this, however, I need to narrow down my options from the endless possible futures. An important guideline for the project of our personal choice is the career we plan to pursue. If I relate my project to the career I have chosen, I am in a path I know I like, and I am given the opportunity to explore and get more familiarized with the field I will be choosing to be in my future.

In my case, I want to study medicine, but as a great lover of technology, I want to get to a point where I can merge both disciplines. The specifics are for me not totally clear for me yet, but I know I want to help people and use technology to do so. Not only that, but I believe it is a study field that for several reasons is what I think will make me the happiest possible in my future. First, it is a way to help people, which is something I always think is necessary when searching, looking and pursuing for your passion. Also, among its main advantages stands out personal satisfaction, because there are many professionals in medicine who say that taking away the pain and saving lives are such profound experiences that make any discomfort in your work worthwhile. In addition to this, doctors enjoy great social prestige and receive high salaries; in comparison with professionals of other university formations or professional fields. In the same way, medical studies form a disciplined character, which ends up becoming a huge benefit in life, and usually goes hand in hand with a notable increase in culture and knowledge, something I love. Not only that but it is a first step into the field I love which is creating technology for the people, and it could end up in very specialized investigations where I could use all of what I know and yet to learn.

However, in this work there are also many challenges to overcome; beginning with the preparation and study time required by this demanding profession. To be a doctor, you do not just have to have a brilliant record, which means years and years of hard work in the university; it is also one of the longest professional careers that exist, with six theoretical years, one year of community or rural work, and four more years of residence in a hospital. Additionally, and according to the chosen specialty, doctors must perform night-time guards on numerous occasions, with the consequent inconvenience that this type of schedule implies in a family structure. Furthermore, a doctor's training never ends, and although this can also be an advantage, it becomes an inconvenience when, over the years, there is not much free time available for studying. Lastly, my final goal implies a lot of extra studies and probably going to other countries in order to learn the specifics of the applications, taking extra time and effort, and as a new research topic, it has its uncertainty.

But all of this access to information I found is more than just a problem for medicine students and apply in many ways to everyone who needs to learn something. And as an approximation to helping people with technology, I desire to solve this problematic in what I consider a very elegant way.

### **How I got there.**

Because the road is more important than the destination, I consider important to show the process of elimination that guide me towards this specific career choice. In order to select a career and to know more about ourselves, Rochester school gave us the opportunity to present to different personality and ability tests that were design to guide our way into college.

### ***Test 1: Personality Test***

The first test I took in eleventh grade at the school was a personality test based on the Type Theory. The test webpage defines Type Theory as a method that “suggests that human behavior is not random, but predictable and classifiable. What type you are says quite a bit about you - your likes and dislikes, your likely career choices, and your compatibility with others.” (<https://www.careertest.net/index.html>), which is very self-explanatory in the sense that is trying to classify our personalities based on the reaction to specific situations. More technically it tries to quantify some traits of the personality in order to give an advice about careers and to give an inside of self-knowledge.

### *Types Definitions*

In the test, each pair of pseudo-opposing trait which try to define parts of your attitudinal traits. In this section I will present what each one means and my personal results in each pair of attributes.

#### *Extroverted vs Introverted*

This category deals with how we prefer to interact with the world and how we prefer to get our stimulation. Extroverts are energized by other people and action. They are talkers, often thinking out loud, interrupting people at meetings, or bursting into a co-worker's office to ask an opinion, and then not really listening to it. Extroverts become drained when they have to spend too much time alone; they need other people to function.

Introverts, on the other hand, get their energy from their own thoughts and ideas, rather than heated discussions. They rarely speak up at large meetings, preferring listening to talking. Introverts need alone time, especially after spending a few hours with people. Introverts are outnumbered by extraverts by about three to one in America.



Extraverts are often rewarded in school, by participating in class discussions, and at work, because they are popular and outgoing. Introverts, on the other hand, are often undervalued because they keep their best to themselves.

I got as a result from my test "Moderate expressed Introvert" with a specific result of 17.6% Extrovert vs. an 82.4% Introvert, making me a much more a quiet and sometimes lonely person which I think I totally are.

### *Sensing vs Intuitive*

This category deals with how we prefer to gather information about the world. As the name implies, sensors prefer to use their five senses to gather information. Sensors are quite literal, preferring facts and details to interpretations. If a hard-core sensor asks what time it is, he or she expects to hear "11:07 a.m.," and not "a little after 11" or "about 11." About 70 percent of Americans are sensors.

For Intuitives, on the other hand, everything is relative. They aren't late unless the meeting has started without them. Intuitives look at the grand scheme of things, trying to translate bits of information, through intuition, into possibilities, meanings, and relationships. Details and specifics irritate Intuitives.

Intuitives see the forest; sensors see the trees. When working with sensors or Intuitives, it is important to remember these differences. Sensors prefer to learn through sequential facts; Intuitives through random leaps. The task- "Please sort through these surveys" - means something entirely different to sensors and Intuitives.

I got as a result from my test "Slightly expressed Intuition" with a specific result of 47.1% Sensor vs. a 52.9% Intuitive, making me slightly more of a person who sees the relations and learn from my opinion. With this one I think it was very arbitrary, because I know I am a mixture of both due to the separation I have between personal life and academy. In the first one I am almost completely Intuitive while in the second I feel completely Sensoring, making this result a little more ambiguous.

### *Thinking vs Feeling*

This category deals with how we take decisions. Thinkers base their decisions on objective values, and are often described as logical, detached, or analytical. Some thinkers are thought of as cold or uncaring because they would rather do what is right than what makes people happy. In contrast, feelers tend to make decisions based on what will create harmony. Feelers avoid conflict; and will overextend themselves to accommodate the needs of others. Feelers will always "put themselves in somebody else's shoes" and ask how people will be affected before making a decision.

This is the only personality type category related to gender. About two-thirds of all males are thinkers, and the same proportion of females are feelers. There often are problems in the workplace for those who don't conform to their gender's preference. For example, a feeling man is labeled a "wimp." Much more negatively, a thinking woman is "unfeminine," she "has a chip on her shoulder" or much worse. Thankfully, nobody is 100 percent thinker or 100 percent feeler (as with the other personality types). Everyone, to some extent, cares, thinks, and feels, but final decisions are reached through very different routes, based on a person's true personality preference.

I got as a result from my test “Moderate expressed Thinking” with a specific result of 76.5% Thinking vs. a 23.5% Intuitive, making me slightly more of a person who sees the things in order to take decision instead of someone who is guided by feelings. I think this result is very accurate because I am usually cool-minded and usually overthink important choices to make the best for the system as a whole instead of reacting impulsively toward my favorite option.

### *Judging vs Perceiving*

This category deals with how we orient our lives. Judgers are structured, ordered, scheduled, and on-time. They are the list makers. Judgers wake up every morning with a definite plan for the day and become very upset when the plan becomes unraveled. Even free time is scheduled. Perceivers, on the other hand, rely on creativity, spontaneity, and responsiveness, rather than a plan or list, to get them through the day. They burn the midnight oil to meet deadlines, although they usually meet them. Perceivers like to turn work into play, because if a task is not fun, they reason, it is probably not worth doing.

Experts say that this personality type difference is the most significant source of tension in the workplace and in group work. Perceivers prefer to keep gathering information rather than to draw conclusions. Judgers prefer to make decisions, often ignoring new information that might change that decision. Hence, the conflict. A good balance of judgers and perceivers are necessary for a well-functioning work group. Judgers need light-hearted perceivers to make them relax, and perceivers need structured judgers to keep things organized and reach closure on projects.

I got as a result from my test “Moderate expressed Judging” with a specific result of 64.7% Judging a 35.3% Perceiving, which matches my organized and planning behavior.

*Personality Type*

With the results of the previous analysis, the page assigns you into a category. In my case it was INTJ Scientist which literary reads: "Most self-confident and pragmatic of all the types. Decisions come very easily. These are the most independent of all types. They love logic and ideas and are drawn to scientific research. 1% of the total population. INTJs' precision thinking and need for accuracy causes them to be inflexible at times. Having thought out a strategy, the INTJ may stubbornly disregard those who they think have not spent as much time reflecting on an idea as they have. This, along with their drive to produce something significant, can make them demanding and difficult. If their plans and solutions fall short of their high standards, INTJ's feel pressured — as if everything is on the line. "Everything," for an INTJ, is the competence and ability to produce something significant. Fear of not living up to this expectation will increase their stress and possibly dissuade them from risking or trying out their ideas. They may then find themselves thinking about ideas that do not have a meaningful or productive end." When reading this I found myself having an almost perfect description on my academic being. The test also suggests some career options that match up with the Personality and therefore could be of my interest. The resulting list is:

- management consultant
- economist
- scientist
- computer programmer
- environmental planner
- new business developer

- curriculum designer
- administrator
- mathematician
- psychologist
- neurologist
- biomedical researcher
- strategic planner
- civil engineer
- intellectual properties attorney
- designer
- editor/art director
- inventor
- informational-graphics designer
- financial planner

From this list I choose the ones that really think that could be options to study are: scientist, computer programmer, mathematician, neurologist, inventor because they are part of the fields of study that I was searching for, applied and research sciences.

***Test 2: Basic Needs Profile.***

At Rochester School I learn since I was 5 years old about the basic needs, Basic need are a subtopic related to “Choice Theory”. According to Dr. Glasser, all behavior is purposeful. It is our

best attempt at the time, given our current knowledge and skills, to meet one or more of our basic human needs, needs which evolved over time and have become part of our genetic structure. These needs are the general motivation for everything I do.

In the test, I answered situational questions that give us a score on each basic need. Next will be shown my results including the final graph it gives out.

### *Survival.*

This need is a physiological need, which includes the need for food, shelter, and safety. Because I have genetic instructions to survive, not only as individuals but as a species, this includes the need to reproduce. In this need I got a score of 4 out of 5 showing that I am a person who needs to feel safe and is not comfortable most of the time in taking risks. Also, it is a way to show that I have a great need for self-preservation.

### *Love & Belonging.*

This need and the following three needs are psychological needs. The need to love and belong includes the need for relationships, social connections, to give and receive affection and to feel part of a group. In this need I got a score of 3,3 out of 5 showing that I am a person who needs certain amount of affection and contact with other people.

### *Power.*

To be powerful is to achieve, to be competent, to be skilled, to be recognized for our achievements and skill, to be listened to and have a sense of self-worth. In this need I got a score

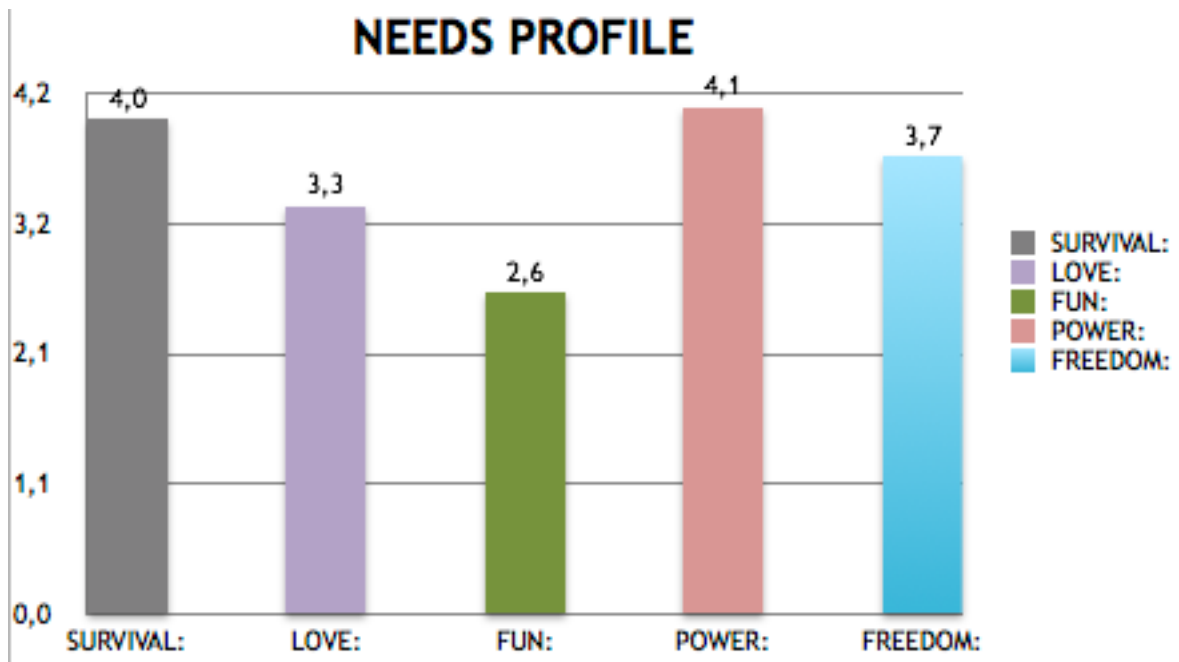
of 4,1 out of 5 showing that I am a person who needs to feel power and is comfortable being a leader and having the ability and responsibility to do something.

*Freedom.*

The need to be free is the need for independence, autonomy, to have choices and to be able to take control of the direction of one's life. In this need I got a score of 3,7 out of 5 showing that I am a person who needs most time freedom although its comfortable having rules.

*Fun.*

The need for fun is the need to find pleasure, to play and to laugh. Should you doubt that this is as important as any of the others, imagine a life without hope of any enjoyment. Glasser links the need for fun to learning. All of the higher animals (dogs, dolphins, primates, etc.) play. As they play, they learn important life skills. Human beings are no different. It is true that "play is a child's work." In this need I got a score of 2,6 out of 5 showing that I am a person who does not need a lot of entertainment in order to be happy.



*Graph 1: Results of the Needs Profile Test*

As shown in the Graph 1, I have two very driving basic need with are power and survival, and not far behind are the rest, being the least fun, which I totally agree with because is the need I learned how to life without, being able to disregard it as expendable during most of my time. As there is not a professional way of analyzing these results but only a way to know about yourself, this test, only show me the traits I show of in my daily life, making it no extremely useful.

### ***Test 3: “Batería de Aptitudes Diferenciales y Generales” (BADyG)***

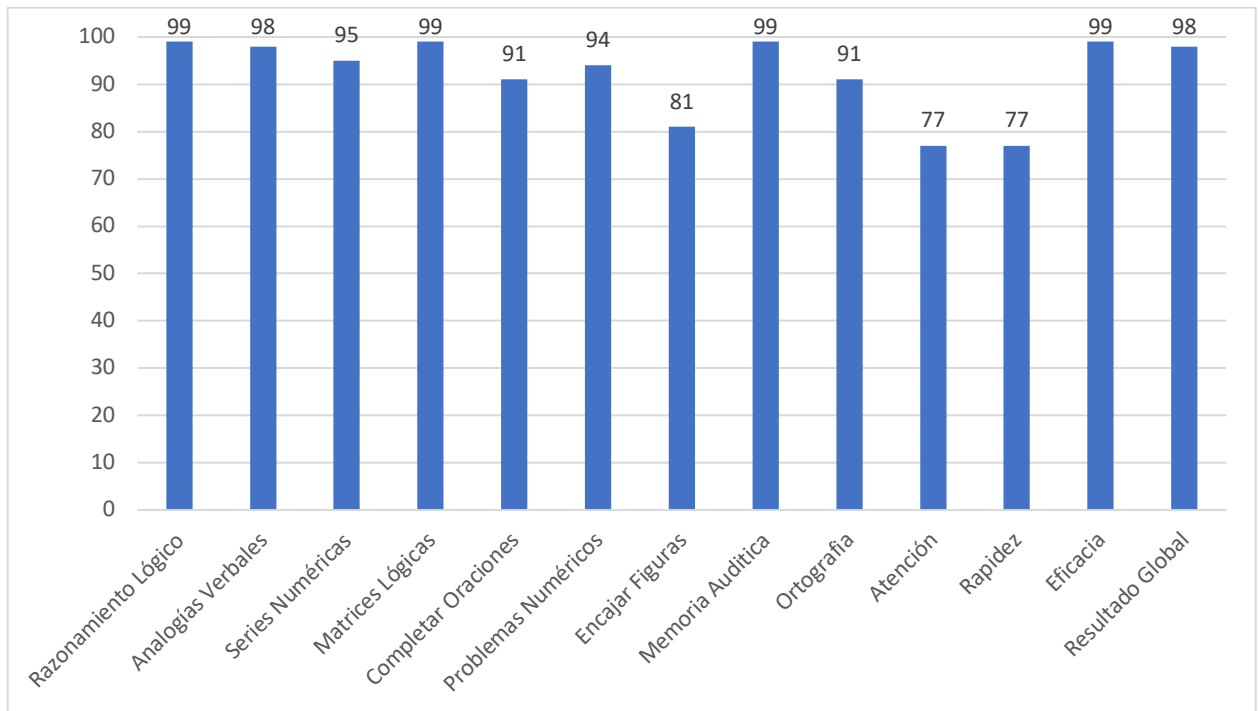
It is a test developed in Spain for the assessment of skills in the school environment. It is composed of 6 levels that cover from 4 to 18 years. BADyG consists of 9 tests that vary according to the level with which 9 scores are obtained. Scores are obtained for the following factors:

- General Intelligence



- Logical Reasoning through the following tests:
  - Analog relations
  - Numerical-verbal problems
  - Logical arrays
- Verbal Factor through the following tests:
  - Analog relations
  - Complete Sentences
- Numeric Factor through the following tests:
  - Numerical Series
  - Numerical Word Problems
- Space Factor through the following tests:
  - Logical arrays
  - Figures rotated
- Through complementary tests, the evaluation is completed with the following measures:
  - Immediate visual memory
  - Alterations in writing
  - Discrimination of differences
- In addition, a score in Efficiency is obtained

At the same time, it allows obtaining a Verbal, a Numeric and a Visuospatial score as well as a Reasoning score that takes into account the Efficiency, Rapidity and Number of Omissions of the student. For this one, my results were quite interesting specially to show what I was good at.



*Graph 2: Results of the BADyG Test*

As shown in Graph 2, I got very high results in every category, being the lowest, attention and speed with 77%. This showed me that I have almost no restriction in abilities and I could choose what I want to do.

#### ***Test 4: “Análisis Aptitudinal y Profesional” (PPS)***

But lastly, if you can do almost anything and the only suggestion is science, how do you choose something more specific? Fortunately for me, there was one last test, that based on particular cases, showed my personal favorite activities, and gave me back the results in terms of career that could be suitable for me. As a result, I got 4 career option which were:

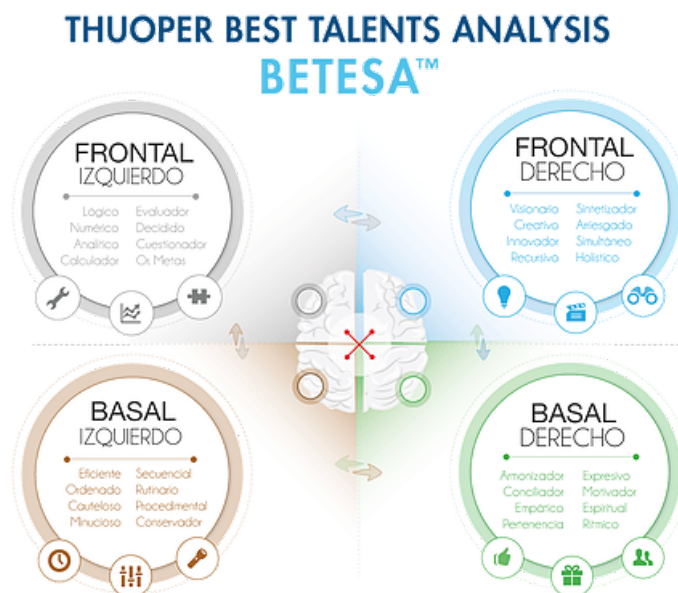
- Natural Sciences: Mathematics, Statistics, Biology, Geology, Physics, Chemistry, Ecology, or Astronomy.
- Bio sanitary Sciences: Medicine, Odontology, Infirmary, Ophthalmology, Pharmaceutical.

- Musical Arts: Music, Production.
- Educational Sciences: Teacher

These results, although very expected, helped me see in a new light my future, having clearer my option and having them written so I could decide among fewer ideas.

### ***Test 5: Thuoper Betesa***

After all, four exams which the school gave me, I still had some doubts, about my future. But my family had a very good experience with this additional personality and competency test, which classify the way your brain works in different ways based on the neurophysiological and energetic characteristics of it. It uses the four divisions shown in Figure 1 and takes some parameters into account when creating this model.



*Figure 1: Betesa model of the Four Styles of Thinking*

1. **Brain dominance:** There is a specific area of the brain where the energy expenditure is 1 unit of energy per unit of time (optimized use of energy). On the contrary, the diagonally opposite zone uses 100 units of energy / unit of time. In other words, there is a particular area of the brain that does not wear us down in terms of energy consumption, while the diagonally opposite wears out 100 times more.
2. **Extraversion and Introversion:** This personality trait is a matter of balance between the inhibitory and excitatory processes of the brain. Arousal is when the brain is activated by its own means, while inhibition is the brain appeasing itself.<sup>1</sup>

### ***The Final Decision.***

Taking into account every test I answered, I could very easily see that my life always wondered among two main careers and one hobby. Engineering (specially related to technology), medicine and music respectively. Based on this I began to investigate deeper in each study plan, work activities and lifestyle of each. Finally, after talking to a lot of people, experts in the field and consultant, I decided that medicine would be the best way to start my development, being the career, I have more desire to take, and later on to merge it with abilities in technology in order to innovate and make people's life easier.

### **Objectives**

As with all research projects, it is fundamental to have a question to guide the follow-up steps. For my graduation project I would like to find the answer to:

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<sup>1</sup> For the complete information: you can go to the following link.  
[https://docs.wixstatic.com/ugd/9a996e\\_2bb34186c1f2449daab1bd75f44336f0.pdf](https://docs.wixstatic.com/ugd/9a996e_2bb34186c1f2449daab1bd75f44336f0.pdf)

*How can Rochester School implement a platform in which trustworthy academic information can be easily access and distribute to students, in order to reduce the amount of work time, improving the final product?*

This project has many specific goals in order to contribute to the community. This is a tool that would be implemented not only for students but to teachers as well in order to facilitate the learning process and provide verified and relevant information to the community. Teachers can also use this as a book, not only for them to add information to help their students and for it to be an investigating element in class but also for them to find useful information for them to improve their classes and teaching methods. Everybody in the community would be able to have access to the platform with an academic purpose using a web page or app.

Nowadays many students struggle finding trustworthy information online for their projects, research papers, essays and other academic assignments. Many of the books that are available for them are not being used like is expected because they don't know how to research in them. The platform would be a really specific tool for them to find relevant information in an easy way. Keeping in mind that I am not able to control student's behavior during classes or what web pages they visit this platform would be an ideal option for the community because it is just for an academic purpose, so students won't have the opportunity to get distracted and it will help improving their performance in class. Teachers can add the information and control it, so students can find the information they need.

The importance of this project is to encourage students to look for more information and go beyond the expected because the school is offering them a tool that they can access whenever they want. It may help them to study all the subjects and find any type of academic information related to their study topics. They can appeal to it for their assignments and to create doubts in them for them to continue seeking more knowledge and applying to higher grades. It will completely give a positive impact in students because they can comply with their learning expectations with high grades and help them encourage to keep up the good work. It may also help to decrease the amount of stress students may have because they are able to find their knowledge book anywhere without doubting their abilities to finish and achieve their work and be successful. This can also contribute to the use of virtues in the community because students have the possibility to help each other, inspiring teamwork and cooperation between their peers. They can be leaders and explain in class different topics they learned in the platform and how what is taught in class can be used in their daily lives and with other purposes. Students connecting what they learn and how is it useful in the real world help them value more the information they learn. Some assignments could be shared in the platform, so students can learn from each other and complement with new information. With an app that doesn't need an internet connection to work could help students to study anywhere they want so they are constantly learning new things they consider relevant and applying the habit of reading that is essential in their learning process.

But in terms of the specific procedure, it is a very demanding project, because in order to do it, I will need to apply many concepts of Node JS to create and manage a server in which the information needs to be organized in conjunction with a digital platform in which it will be

displayed. The best-case scenario will be to make it institutional and having it in a subdirectory inside the school's webpage.

In short, this project has a very ambitious idea behind it, but it is possible and very useful for others in theory, helping everyone to be better off. But in order to be completely certain, I needed to ask others.

### **Others & the Context**

My consultant, Alejandro Zarate, agrees with my perception in terms of the problematic and the possible solution, giving me advice on the importance of the application. He, himself has always been a person with the mind open to technological solutions to existing problems and always teaches for students to design their own future, designing for community problematics. He told me how useful it will be and taught me the abilities I needed in order to code my way into a successful project and refine my idea of what the project should be like.

Another teacher who helped me think about my project is David Miranda, who during my interview, helped me using questions to refine the idea, and gave a big contribution to the way the project is heading. For example, the idea of having more than plain text and formulas, but to have useful resources and links in order for students who have different styles of learning to have a useful site. He suggested the inclusion of tools, links to videos and articles in order to open the spectrum of usefulness. And obviously commented about how to take a dream, and transform it into something real, with a correct procedure for everyone to see it as useful.

But, returning to my desired image, the key is to know what I picture our outcome will be like. *What do I want for the future by developing this project?* I want students to have something

at their direct reach that can motivate them and help them to have better grades and more importantly, to learn more about every topic. *Specifically, how would I like the project to work on a daily basis once it is implemented?* I imagine the classes to have a tool where people with difficulties or that want to learn more, could find a place to go, and for everyone to think of it as a useful resource when studying and learning. *How would it look like, feel like or sound like if the project was successful?* The students and teacher will have less academic demand, letting them learn and teach more interesting topic, and transforming the classes into a more practical and dynamic version of themselves. Also, a simple way for everyone to learn is an improvement in the quality of life of students who will not be spending sleep hours in research or trying to understand without help. All of these reflection questions taken from Juan Pablo Aljure's article.

And so forth, my picture of the final outcome could be summed up in people from the Rochester School community, especially students in high school, have seen and lived the different ways of receiving information through a page or app that catalyzes learning, and facilitates the access to crucial data for them.

Nonetheless, our own desires are not everything that matters in the process of cultivating a project. I have to know what others want as well and realize if they would be interested in seeing our project come true, because in the end, they will be the ones living it and receiving benefit from it. Which is why, I am supposed to design a survey and actually ask people all of this.

The survey has two main purposes: first obtain information about how are they currently using the platform and second how would they like to use it. During this next section of the document you will be shown the question of the survey and its corresponding results, for this reason I will explain the methodology used to obtain the information. There are in total twenty-



eight questions, twelve are to obtain information about the usage of the platform and the information inside it (current situation), the other ten questions are for gaining information about what do students expect from the project (desire image). The sample of this project was high school students. Fifty-four people answered the survey.

***Questions for Student Identification:***

1. What is your name?
2. When is your birthdate?
3. What is your role at Rochester School?
4. What grade are you in?
5. What is the subject you have the most trouble understanding?
6. What is your Rochester School Code?

***Questions for the Current Situation:***

1. How many times a week do you consult a teacher during non-class hours?
2. How many hours do you spend to investigate a topic for class?
3. Have you ever had trouble finding reliable information?
4. What resources do you usually use to research?
5. How ethical and credible is the information you usually find?
6. Where do you usually investigate?
7. How many hours do you spend doing homework per day?
8. Which subject do you spend the most quantity of time doing homework in?
9. What devices do you have?
10. What devices do you bring to school?
11. How much have you heard about Rochester's Database?

12. How useful was it for you?

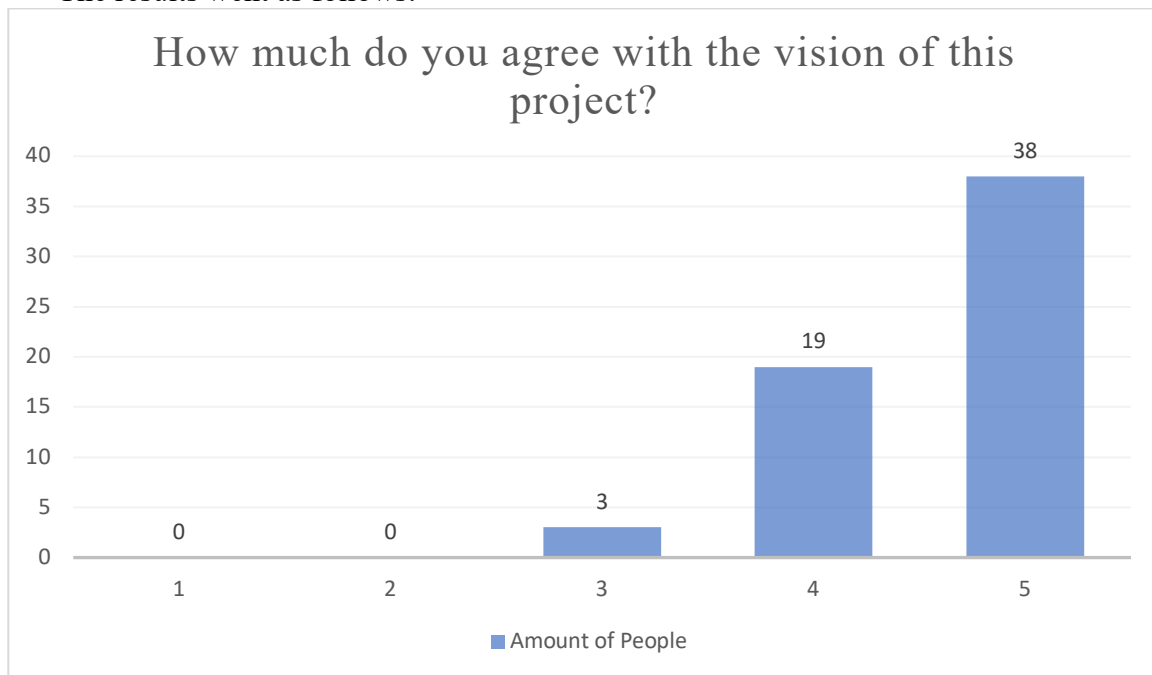
***Questions for the Desire Image:***

1. How much do you agree with the vision of this project?
2. Would you use this resource?
3. How useful do you think it will be?
4. How do you learn the most?
5. What would you prefer to see in the platform?
6. For which subjects would you use it?
7. Do you think this project would improve the learning of the students?
8. How much do you think that the academic performance will improve with it?
9. What would you consider more useful?
10. How many hours would you consider optimal for homework?

For this section in particular, I am interested in other's opinion with respect to the desire image, at the end of the essay you will have the complete results and further in the essay, I will analyze the other half of questions. The first question of this section is How much do you agree with the vision of the project, which was presented as follows:

*“For my Graduation Project I want to create a way to distribute information, either an app or a webpage, in which every student could search and obtain academic information related to the topics they are viewing in class. It will have, also, useful tools, like exercises, solvers and videos, for students to learn in different ways. The idea is for it to be of the school and have sections for every subject, so everyone can have an extra tool to ask for help.”*

The results went as follows:



This shows that many students think that implementing my project will help the students and is something that they think is necessary. The next question's results went as:

### Finishing Data Analysis of Surveys

### Life Competencies

Probably the most important thing I get from developing a whole project could be the life competencies I start cultivating. Adequate use of information and cooperation and collaboration are fundamental competencies in the contemporary world. Adequate use of information is a life competency that could prove useful to us now and in our future. We are going to be exposed from now on to so much information on whatever we desire to know about, due to the easy access to it, with the internet for instance. Thus, it is very important to learn how to manage a research. I intend

to use what I have available, new resources and the ones in the annotated bibliography, the surveys, among others, to support my process with the project, to have arguments that are a foundation for what I aim at. Therefore, it is important to learn how to choose information that is useful and coherent to our research and to what we wish to argument. If we have all of these resources within our reach, we might as well use them as valid support and complement so our project lays on something more than our own personal views and wishes.

Cooperation and collaboration are competencies that, again, apply to every phase of our lives; they are always present and always important. When designing and implementing a complete project, there is always a need for guidance and counseling, for which our facilitators and consultants are available: by cooperating with them, our friends and family during the process, we are developing in a practical way these life competencies all the time. Additionally, in my project, the community spirit and component is a principal objective and it definitely lies upon the basis of cooperation and collaboration. But it is also useful to my professional career, which is founded in the principal of helping other and using international levels of teamwork to help everyone we can to live a better life. And in the field of technology, no advancement could be made if people didn't share with the worldwide community their discoveries and ideas.

As for healthy mind and body, I am not the only one who is in the process of developing this life competency; this is one aspect I am trying to improve in the community with my project, letting them get more time to spend on healthy habits like sleeping and having family time, which are essential in this stage of life.

Also, leadership is evidently a necessary skill for guiding this project to success; however, in the process we cultivate it massively. We have to be leaders to be able to face with responsibility

all the due dates, to do research and find the resources we might need, to make our ideas turn real. Just as with leading, the ability to solve problems is a main part of project-making, it is basically what it is based on. Projects will always have difficulties and its part of the point. By developing our own project, we are supposed to develop such a needed skill in life, the skill to move on no matter what. Some people might say my project is too simple, or I might have a hard time putting together or printing the anthology: these issues I intend to solve, and this will undoubtedly develop my ability to find solutions. And if we take the definition Juan Pablo gave in his articles, we find that the mere presence of the project, of wanting a positive change in society, and working for it, making it reality, is what leadership is all about.

Conserving biodiversity might seem as a weird life competency to develop at first, and completely unrelated to what I am trying to do. But actually, if we consider the definition of biodiversity as being: "diversity among and within plant and animal species in an environment" we can see that it is the skill to respect every type of person in our environment. Each one of us is so different and therefore our projects and ways of learning will be as well, if we learn to appreciate every point of view and realize that there can be cooperation among differences, which also applies to our teachers and counselor, we are sure to find success. If we take advantage of the different talents, we have around us, there are many things we could accomplish, which comes very hand in hand with cooperation and collaboration, as I now realize. Furthermore, developing a project that includes every member of our targeted population is really what could make a difference in our success; exclusion is the total opposite of biodiversity and it is not what our projects should be about. And in the more ecological sense, the use of technology to minimize the use of paper will also play a very big role in the end product of this project.

## Chapter II

Once we know what we want to do in a project, we have to stop for a minute and see what is around us right now. By doing this, we realize specifically what aspect of what is going on in the moment we would like to improve or change for the future. This is very useful in the moment of evaluating success; because the current situation is the image we refer to if we wish to check how much we have advanced. This is something we will do in future stages of the project-realization strategy. For now, however, we are in phase two. In *Sistema de realización de un proyecto* (2009) Juan Pablo Aljure describes phase 2, and it basically constitutes the current actions: what is taking place in this exact moment. As I said, during this stage we analyze, by observing and inquiring, what is going on regarding or topic and are we chose for our project. Like always, several perceptions are fundamental for the enrichment of our picture. This is why, our surveys, for instance, can provide us with an important insight.

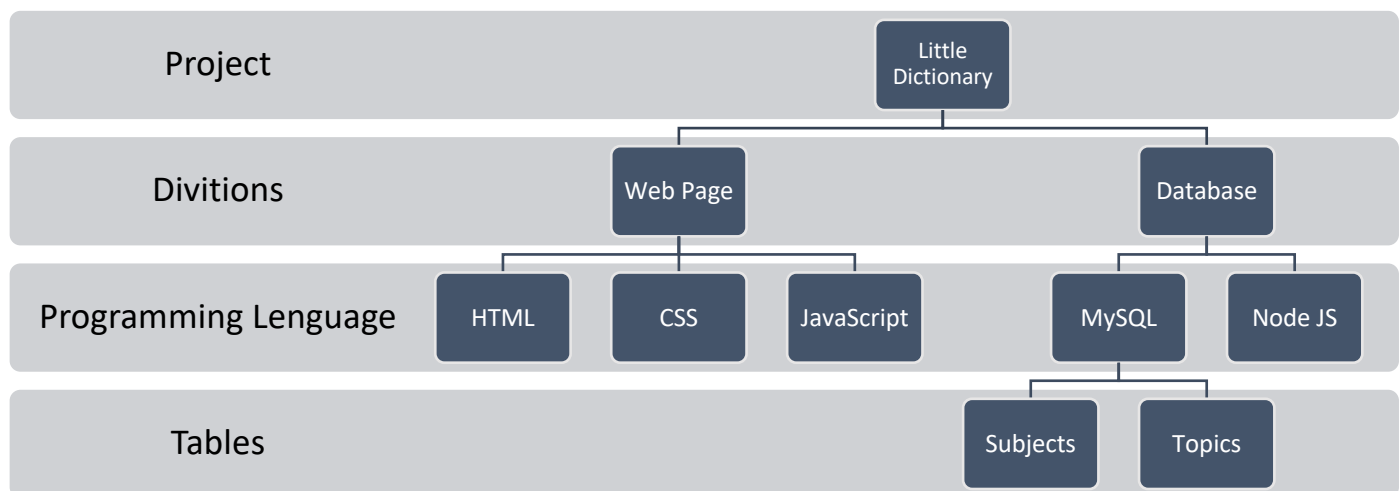
### Theoretical Framework

*How can Rochester School implement a platform in which trustworthy academic information can be easily access and distribute to students, in order to reduce the amount of work time, without changing the final product?*

As I stated in chapter 1, this question is the foundation of my project and what is leading my research. For being able to answer this question and having a clear image of what we are looking at, it is important as well to fully understand the concepts I am constantly talking about and that are relevant to my project. This can clearly be seen in the next table and diagram.

<i>Term</i>	<i>Definition</i>
Database	Collection of data, or information, that is specially organized for rapid search and retrieval by a computer.
Structure	Way to organize data in a useful format
Web Page	Retrieval unit on the Internet
Information	Sequential representation of meaningful data that give a certain output
Subject	Area of learning in charge of studying a specific set of ideas and topics

*Table 1: Important Terms and Definitions*



*Figure 2: Graduation Project Structure Planning, relating Concepts*

## Literature Review

Building the database is just the top of the iceberg, before building the database I investigated about the different types of information resources, in order to recognize their differences and the advantages each of them provided. First, there are two kinds of classifications for the information resources. The first one is called information flow that is divided into primary, secondary literature, and tertiary literature, each one differ in the immediateness of the information published. Primary literature is where the information first appears, right after a congress, the latest scientific theory, it the first place where the information appears. However, it can happen that the information that is published has not been proven or lacks information to be used as an information source. In second literature the information has passed several reviews (Nottingham, n.d.). Tertiary literature “records facts and description of the key information, as in a reference material.” (Nottingham, n.d.) In other words, the theory is explained in detail, every single aspect of the theory is accepted, and inside the publication every aspect of the theory is explained in depth with references. Books for example, which are one of the most commonly used type of sources publish second or tertiary literature, while more periodically publish source such as the journals publish primary literature mainly. Remember that the difference of the stages, depend only on the time it takes to be publish, not in the quality. It may happen that there is a scientific theory published in a journal may appear later on in an encyclopedia or in a book. The second classification is, simply, the different types of information resources with its advantages and disadvantages. First, I am going to list the information types and then I am going to briefly mention its advantages. Information types: dictionaries, encyclopedias, books, journals (defined as: “A collection of articles relating to a particular topic”) (University, s.f.), websites, newspapers, magazines, conference proceedings (defined as: “a collection of papers reporting on presentations or posters



delivered at conferences, seminars or workshops. They are sources of primary research information as this may be the first place the information has been made public.”) (Nottingham, n.d.) reports (Defined as source of information where you have to use a “structured format making use of sections and headings so that the information is easy to locate and follow”. “Specific information and evidence are presented, analyzed and applied to a particular problem or issue”) (Leicester, s.f.), patents (defined as: “legal documents which give the owner exclusive rights to profit from an invention, protecting it from exploitation by others unless they have the prior agreement of the patent owner.”) (Nottingham, n.d.), and theses (defined as: “doctoral degrees research output.” (Nottingham, n.d.) However, theses could include research output of professional career degrees or why not school degree.)

<b>Information resources</b>	<b>Advantage</b>
Dictionaries	<ul style="list-style-type: none"> <li>• Dictionaries are useful to find definitions of terms, subjects or topics.</li> <li>• Determine the subject context of a new topic to help with further searching.</li> <li>• Subject-specific dictionaries provide definitions of specialist terms.</li> <li>• Foreign language dictionaries translate foreign terms into English or vice versa.</li> </ul>
Encyclopedias	<ul style="list-style-type: none"> <li>• A concise overview of the key aspects of a subject or concept.</li> <li>• A review of the history of a topic.</li> <li>• References to further information.</li> </ul>

	<ul style="list-style-type: none"> <li>• Biographical details of key figures. .</li> </ul>
Books	<ul style="list-style-type: none"> <li>• An in-depth overview of a subject.</li> <li>• A good grounding in a new discipline.</li> <li>• A comparison of differing ideas, theories and opinions.</li> <li>• Facts and figures.</li> </ul> <p>(Disadvantage)</p> <ul style="list-style-type: none"> <li>• Books can become out of date.</li> </ul>
Journals.	<ul style="list-style-type: none"> <li>• Reports of original research.</li> <li>• Reviews of current subjects of interest.</li> <li>• News and comment on topical issues or professional concerns.</li> <li>• Lists of forthcoming events or conferences.</li> <li>• More up-to-date than books as publication is faster.</li> <li>• Quality checked during peer review process.</li> <li>• Include the latest research.</li> </ul> <p>(Disadvantage)</p> <ul style="list-style-type: none"> <li>• Are not as broad as books .</li> </ul>
Websites .	<ul style="list-style-type: none"> <li>• Easy access.</li> </ul>

	<ul style="list-style-type: none"> <li>• Mostly up-to-date (but check). Include various types of media e.g. illustrations, videos, sound.</li> <li>• Available 24/7.</li> </ul> <p>(Disadvantages)</p> <ul style="list-style-type: none"> <li>• Variable quality and lack of control. Anyone can publish a website.</li> <li>• They may become out-of-date.</li> <li>• Content can be biased.</li> <li>• Websites can disappear.</li> <li>• Information overload.</li> </ul>
Newspapers	<ul style="list-style-type: none"> <li>• Currency/immediacy.</li> <li>• Eyewitness accounts.</li> <li>• Awareness raising.</li> <li>• Opinions and comment on topical issues.</li> <li>• Reviews of books and contemporary culture.</li> <li>• Obituaries of famous people.</li> </ul> <p>(Disadvantages)</p> <ul style="list-style-type: none"> <li>• Lack of peer review or accuracy checks.</li> <li>• Sensationalism/writing to sell copy.</li> <li>• Bias, perhaps written with particular political viewpoint.</li> </ul>

	<ul style="list-style-type: none"> <li>• Not usually written at an academic level.</li> </ul>
Magazines.	<ul style="list-style-type: none"> <li>• Indicate areas of professional interest.</li> <li>• Up to date coverage of news and opinion.</li> <li>• Opportunity for communities to engage.</li> <li>• Feature new services, resources or areas of interest.</li> </ul> <p>(Disadvantage)</p> <ul style="list-style-type: none"> <li>• Not as extensively quality reviewed as journals .</li> </ul>
Conference proceeding .	<ul style="list-style-type: none"> <li>• Current issues in a particular field or area are often debated at conferences and the discussions included in the proceedings</li> <li>• Papers can be presented at a conference long before, if ever, they are published in a journal</li> </ul>
Reports	<ul style="list-style-type: none"> <li>• Up to date information since they are usually published to a specific deadline or as a reaction to an event.</li> <li>• Current views and opinions.</li> <li>• Recommendations about future practice.</li> <li>• Technical information, statistics or data that you would not find in books or journal articles.</li> <li>• ( Disadvantages)</li> </ul>

	<ul style="list-style-type: none"> <li>• They become out of date as they reflect the current situation at a given time.</li> <li>• Not all reports are published so they can be difficult to locate.</li> </ul>
Patents	<ul style="list-style-type: none"> <li>• They are the first reports of commercially-sensitive research.</li> <li>• They document research not reported in journals.</li> <li>• They contain detailed descriptions and, if relevant, designs or other illustrations.</li> <li>• They can show trends in development and applications of new technology.</li> </ul>
Theses	<ul style="list-style-type: none"> <li>• Research undertaken at universities around the world.</li> <li>• Details of research completed by others in your school or department.</li> </ul>

*Table 2: Types of Data, (All the information in this chart was taken from University, s.f. and Nottingham, n.d.)*

Another important part of analyzing the current situation of a project, or of project-making as a whole, is doing research. Research in this case has the purpose of finding what has been already studied about our topic of interest: what is already in course that is related to what we plan to do. I have found some sources that have both similarities and differences with my project, but

that might be useful for me and are a reference I can go back to. I will analyze them in depth in the following paragraphs.

### ***Designing Rochester's School Database by Nicolas Rojas***

During last year, Nicolas Rojas as part of his graduation project created a database in the Schoology platform in which he held several resources related to the different topics of High School subjects and other activities such as TOEFL IBT and the state exam Saber 11. He uploaded several PDF's full of notes in which he summarized the different topics. Something to improve upon this database is:

1. The expandability and versatility of the platform in order to have videos, images, explanations and tools for others to use in the day to day activities.
2. The accessibility, because as seen, many didn't know about the existence of the database because of the limited access Schoology gives.

Nevertheless, this grounded the beginning of my own project, creating and letting it into the future, therefore, need a mention in as an inspiration for myself.

### ***Universidad Nacional Database***

My project is based on similar projects that are already implemented like: "Universidad Nacional" (UN) repository and database. The "Universidad Nacional de Colombia" has a free access virtual library, where students can find articles from some paid databases, specialized in some specific topics. These are some of the various databases a Nacional university student has access to: Access Medicine (specialized database in medicine), Access DL (contains 16 journals,

and 310 volumes of different books), ASME (The American Society of Mechanical Engineers), Canadian Patents Database, and SIAM (“Sociedad para Matemáticas Industriales y Aplicadas”). This university has its virtual library and its own repository where the students upload their thesis and investigations. The variety of information resources and the different databases they use facilitates the access of information for their students.

### ***Mendely Database***

Another one is Mendely a platform where the users publish their works and they have access to different contents people had upload. All the contents are academic and there are various uses of the platform: you can publish, collect different sources in a private folder, it facilitates APA and other standard styles of citing and it offers the possibility of being part of private or public discussions.

### ***Microsoft: Encarta***

Lastly, I will talk about the Encarta developed by Microsoft (released in 1993 and was available in cd until 2009). This product was revolutionary for its time; before the product existed, everyone had to buy encyclopedias and books to study. The encyclopedias were the most reliable and easily accessed source of information. The last version of the Encarta had more than 62.000 articles. The version I had in my computer divided the information in its home page in: landscapes and regions (geography), living thing (biology), science, math, sports, history, our society, language and literature, arts, and play. This were the big categories, each section and subsections to guarantee that the user can easily access the information. What I want to highlight from the Encarta was the way they divided the information. There is no much information about the

classification of all the areas that were condensed in the Encarta, but I could find the sub classification of the section Living Things, topics: life, human body, microorganisms, plants, animals, ancient living things, and nature in action.

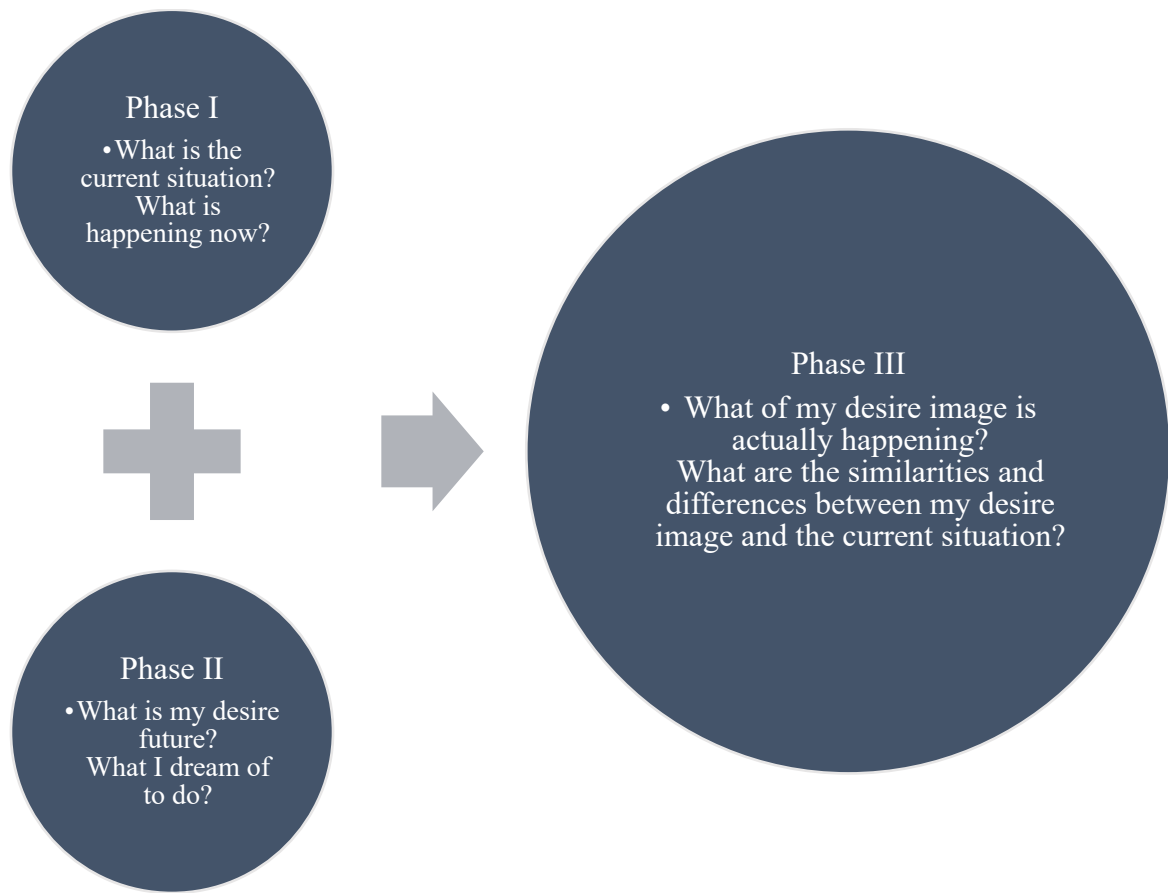
### **Current Situation Based on Surveys**

#### **Finishing Data Analysis of Surveys**

## **Chapter III**

Once we have phase I and phase II, we are ready to connect them to the next step: comparing them both. We already know that phase I describes our vision, what we imagine for the future. Moreover, phase II is our research and analysis of what is currently happening. Phase III is finding how are these two scenarios similar or different.





*Figure 3: Diagram Phases I, II, and III*

Having this information in mind, we realize that phase III is mainly a comparison, but it is also an evaluation. Thus, in this chapter, I will be analyzing the actions currently taking place in my project's field of impact, technology and information, by asking myself if the current methods are working, and if not, why? Additionally, I will be contrasting how I see the future with the current state of the projects following the main guidelines of information and accessibility.

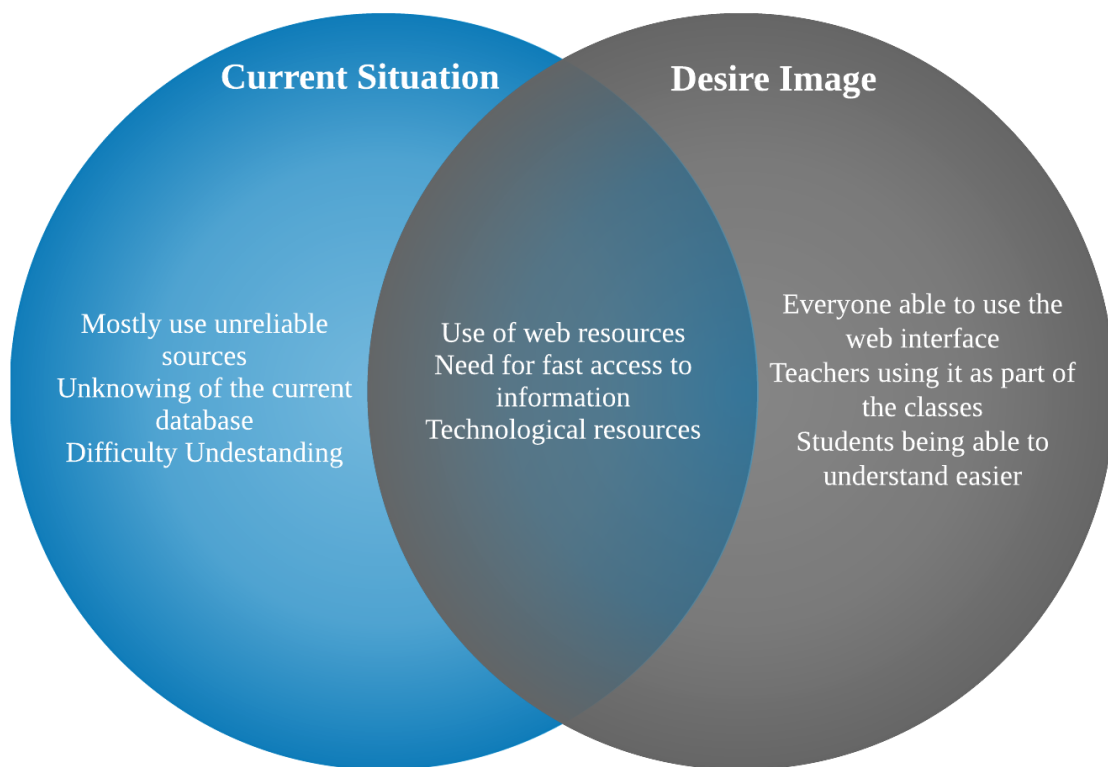


Figure 4: Venn Diagram comparing and contrasting Current Situation and Desire Image

To fully understand current actions, I think it is important to understand the big picture: this corresponds to evaluating the system as a whole. *“Am I keeping my focus on areas of influence, rather than on areas of concern that I cannot influence?”* Is a question I can ask myself to have perspective regarding the current actions in relation to desired images. I think that my project, as a tool for students does maintain a small and accessible area of influence during this first demo stage. As a project it can be

*“How have the elements changed over time?”*

*“How does the organization and interaction of the parts create the behavior that emerges?”*

*“If we make a change to the system, how long before we see the results that we desire?”*

Is a very interesting question when considering the time aspect, a system thinker should take into account. I consider my project is not necessarily a change in the system, but a complement to existing resources, and a try to improve upon in order to solve a problem that is very widely spread in the entire world, which is lack of information due to communication and access to reliable sources.

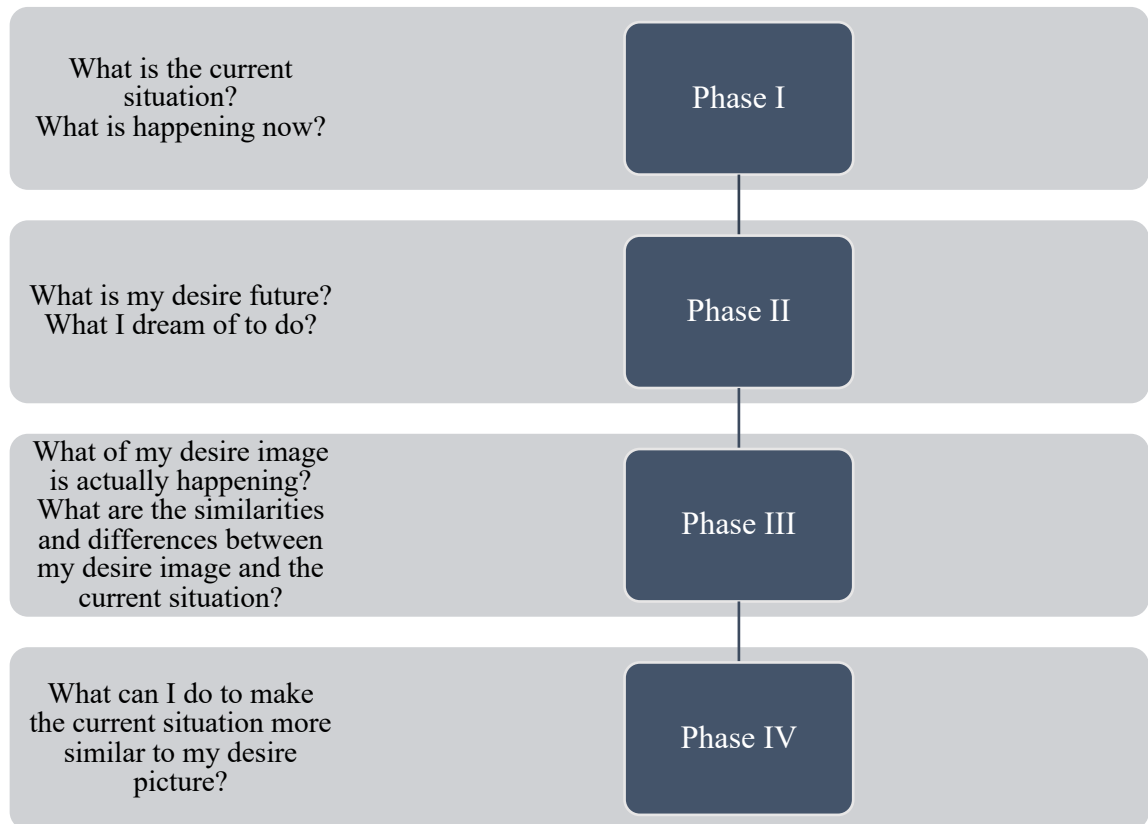
### Finishing Chapter

## Chapter IV

During the last phase, phase three, we looked at how our desired image and the current situation were different but also similar: the space between the now and our ideal future. We actually did a Venn diagram in order to compare properly. By doing this, I actually realized how important is this space between the two circles: the similarities. It is very important because it is a starting point in which we find a foundation for our action plan. The way I understand it, the action plan has as a general objective making this little space of similarities become bigger and bigger, more similar to the desired image, just as Juan Pablo explains: *“Después de evaluar la diferencia entre lo que hacemos en la actualidad y lo que queremos del futuro, tenemos claro lo que falta para llegar a la imagen deseada del futuro.”* (Aljure, 2009).

That is the objective of phase IV, designing the specific actions in order to move towards our pictured future, towards the final product we wish to accomplish. Moreover, once these actions are implemented, it is also part of phase IV how to evaluate them. It is fundamental to take a

moment and look back to see if we actually did everything we planned and if we did, did it go as expected?



*Figure 4: Diagram Phases I, II, III, and IV*

The action plan I designed in order to move closer to my desired product and visualized future, goes as follows.

Action	Description	Beginning and Ending Date	Objective	Resources Needed	Organizational Variables
Database	I will create a web database in order to request information	Nov 15 <sup>th</sup> , 2018 Apr 22 <sup>nd</sup> , 2019	Having the backbone and interactive web app in order for	Time and Organization	Learning and innovation, Customer experience, Resources, Organizational

	from a server.		people to use it.		structure, Legal & green context
Information	Populate the database with useful information related to a subject.	Feb 1 <sup>st</sup> , 2019 Apr 22 <sup>nd</sup> , 2019	Having the information needed for students	Time, Information and Organization	Learning and innovation, Resources, Legal & green context
Publishing	Uploading the web application into the internet for availability	Apr 22 <sup>nd</sup> , 2019 Apr 26 <sup>th</sup> , 2019	People will have access to the information	Alejandro's help Time	Learning and innovation, Resources, Legal & green context, Customer experience
Publicity	Inform People that the Web application is now available with posters and voice to voice	Apr 26 <sup>th</sup> , 2019 Apr 30 <sup>th</sup> , 2019	People will start using it	Time, Paper, Social Skills	Customer experience
Feedback	Collect feedback related to the use of the database from the webpage and surveys	Apr 29 <sup>th</sup> , 2019 May 3 <sup>rd</sup> , 2019	Collecting feedback in order to improve	Time, Survey, Student time	Customer experience

*Table 1.* Action plan

In order to analyze whether this was an appropriate action plan, I evaluated it with each of the 7 P's. The 7 P's are a method in which we judge our action plan to see if it has all the right components and will be actually helpful on our way to success.

**Precise:** actions are clearly described, and I have a specific image of what I have to do for each one of them.

**Positive:** all of these actions are towards a goal, without underrating what is already going on in the dynamics of the school.

**Possible:** these actions are clearly real and are things I can accomplish without any trouble.

**Promise:** the chart and the dates are a commitment I make towards my project and with myself: I know that I need to work towards these actions if I want to move forward with my Project.

**Practice:** there is no major risk with me implementing these actions. If any, I can practice the printing and quality with some drafts.

**Persistence:** as I said, this action plan is a commitment mainly with myself. Therefore, I will try my best to act within the stipulated dates: aware that all of them are a step closer to my goal.

**Pronto:** all the dates stated in the plan are specific and during a very short period of time that is practically immediate.

As for this action plan, I know that it was very useful because of how specific it was. I can conclude it was successful because it actually helped me to stay on track and be more organized with what I had to do. All of the 7 P's were as I initially described them. It was, after all, a very simple but specific action plan which proved to be very convenient for me.

**Finishing Chapter**

## **Chapter V**

In order to differentiate the final result from the planning, during Chapter V, I will describe the final result and conclusion to this project.

**Finishing Chapter**

### Citation, References & Bibliography

Alarcon, L.M. (2018, May) *Handbook for a Smile - Three-Dimensional Hand Prosthesis* [PDF]. Chia: Rochester School

This essay is a 2018 Rochester School which researches the possibility of making 3-dimensional hand prosthetics made by Lina Alarcon during her senior year. In it, she explains the process of making one and how she develops the project with help of the school's guidance. She uses surveys to gather data and uses every single step in the development of her project, using correct references and writing. It had some limitations in terms of general acceptance and in the applicative part due to time. This document is the best in terms of recent graduation project because it was from last year's seniors which are the most recent examples of complete graduation project. And although it was written by a High School student, it has a great amount of resources and references. For the project presented in this document it was very useful in the sense of form, giving an example of how the final document for the graduation project is and what should be the final content when writing a Graduation Project.

Aljure, J. (2009) *Sistema de realización de un Proyecto. Elegir, 12, 4-9*

This is the primary resource in Graduation Project because it is the base in which this idea is founded in. It contains the phases description and requirements, and it guides what the projects should accomplish to be justifiable. It is a step by step guide to what should a project should be and what should you do to lead into success is. The system of project realization presented in this document follows a method called DAEP (WDEP) that the director of training of the William Glasser Institute, Robert Wubbolding, proposed since 1986 which has been adapted to include



organizational systems, professional relationships and systemic thinking. Juan Pablo Aljure, author of this article, is an Advanced Professor of the William Glasser Institute, Electronic Engineer, master's in educational administration, specialized in quality and systemic change of organizations towards happiness and Magister in Environmental Resources Management; President of the Rochester School Foundation, founder and president of the ELEGIR Foundation publisher of the article. The information contain within this publication was very useful when deciding over the topics talked about in this essay and the procedure, I should take in order to have a well-designed Graduation Project.

Carrillo, M.L. (2018, May). *An Anthology as a Gift* [PDF]. Chia: Rochester School

This essay is a 2018 Rochester School which researches the possibility of making writing a better exercise at Rochester School made by Maria Lucia Carrillo during her senior year. She tries to answer, "How can representations of culture, like short poems and movie/book quotes, contribute to a positive environment, while enriching students in high school and the learning process?" and tries to implement a project to stimulate student's writing. She uses surveys to gather data and uses every single step in the development of her project, using correct references and writing. It had some limitations in terms of general acceptance and in the applicative part due to time. This document is the best in terms of recent graduation project because it was from last year's seniors which are the most recent examples of complete graduation project. And although it was written by a High School student, it has a great amount of resources and references. For the project presented in this document it was very useful in the sense of form, giving an example of how the final document for the graduation project is and what should be the final content when writing a Graduation Project.

Dans, E. (2009, April 1). *Encarta, un caso interesante*. Retrieved from <https://www.enriquedans.com/2009/04/encarta-un-caso-interesante.html>

#### Annotated Bibliography

Goodman, M. (n.d.). *Water Foundation*. Retrieved 2018, from <https://www.watersfoundation.org/systems-thinking-tools-and-strategies/habits-of-a-systems-thinker/>

#### Annotated Bibliography

Leicester, U. o. (n.d.). *Writing reports*. Retrieved April 10, 2018, from <https://www2.le.ac.uk/offices/ld/resources/writing/writing-resources/reports>

#### Annotated Bibliography

Nottingham, U. o. (n.d.). Types of information resources. Retrieved February 12, 2018, from <https://www.nottingham.ac.uk/studyingeffectively/reading/infotypes.aspx> 7.

#### Annotated Bibliography

Rojas, N. (2018, May). *Graduation Project: Rochester School Data Base* [PDF]. Chia: Rochester School.

#### Annotated Bibliography

Solent, U. o. (n.d.). Successful research. Retrieved February 15, 2018, from Successful research:  
<https://learn.solent.ac.uk/mod/book/view.php?id=116227&chapterid=15177#Journal>

#### Annotated Bibliography

THUOPER S.A.S (2017). *Manual Técnico de Prueba Thuoper Betesa™*, Bogotá.  
<https://www.thuoper.com/betesa>.

#### Annotated Bibliography