**Science Journal of Education**
2018; 6(1): 22-38
http://www.sciencepublishinggroup.com/j/sjedu
doi: 10.11648/j.sjedu.20180601.14
ISSN: 2329-0900 (Print); ISSN: 2329-0897 (Online)

# Use of Facebook to Learn Photovoltaic Theory

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**To cite this article:**
Mario Humberto Ramírez Díaz, Mario Rodríguez Castillo, Isaias Miranda Viramontes. Use of Facebook to Learn Photovoltaic Theory. *Science Journal of Education*. Vol. 6, No. 1, 2018, pp. 22-38. doi: 10.11648/j.sjedu.20180601.14

**Received**: February 19, 2018; **Accepted**: March 6, 2018; **Published**: March 27, 2018

**Abstract:** Facebook is the most popular social network among college students. Its significance has transcended beyond its purpose to the point where is presumed to be able to support a learning environment for teaching physics. The purpose of this research is to investigate if Facebook offers a useful and meaningful educational environment able to support, enhance or strengthen the learning of Physics in college students. The research will conduct an experiment in which observable throw achieve: [1] Identify the concept of students about the use of Facebook as a virtual environment that facilitates learning of physics. [2] Identify instrumentation elements developed by students during the use of Facebook as a learning environment in the subject of photovoltaic theory. [3] Identify the satisfaction of a group of 50 students in their first year of college about the learning experience of the use of Facebook as a learning platform. All this under the perspective of Instrumental Genesis.

**Keywords:** Physics Education, Facebook, Instrumental Genesis

## 1. Introduction

Facebook. The outline of new technologies –especially social networks- in the classroom has become significant for students. Consequently, more and more university teachers embrace the idea that it can also be used at the academic level not just at a social event [1].

The education system –more specific school administrators-is just taking advantage of this trend –the industry is reducing the price of computers, so school administrators are pushing forward to this side. Efforts from educators have been in the fashion of adaptation –without any scientific support. For example, in recent years, students have been provided with technology –software, iPad, etc. for the classroom –most of the time with technologies attached to the Internet. But still nothing close to get the real solution. Exist many problems carried out with the merging of technology but not all is a negative step behind for the classroom [2]. But unfortunately, this change is a small step into the satisfaction of new students' academic needs. The fact is that this kind of technology has a purpose, very determined, that is opposite to the application that the educators want to give to it [3]. In some cases, educators try to fit the characteristic of these new kinds of students into a series of application with different purpose that at the end, the experience of this assisted learning proceed to a no meaningful learning experience.

Different scholars have defined some line to coping different concepts and start merging towards the conclusion of a new framework. They agree that these new students require more technology. For this, it is necessary to make an effort in the transformation of the educational process, and for this, we see three bases at the first place to begin with (1) demographics, (2) technologies and (3) style of learning. These three bases are the pillars for the next experiment, which will try to find elements for a new framework required by students now. It is very important that take into consideration this learning characteristic for them. For example Tapscott [4], with the theme of "Generation Net" as well as Prensky and Howe &Strauss [5, 6] they concluded on that this type of students are characterized by the teamwork, experiential activities and the usage of technology. In addition, they are very good working in multiples activities simultaneously.

## 2. Digital Natives, New Framework Hurdle

As we noticed, we are educating a new category of students- the digital natives. Respecting the research of

digital natives (this is the most used terminology to name them), paying attention to their contexts a very important situation. We can see at a glance that education does not meet the social learning demands on them. The student's performance is affected by the speed of the changes that occur at the social dynamics [7]. Students learn differently; students use different learning schemes to adapt to social changes. The learning experience among students is a very complex issue. According to some authors [8] "The classroom is now an increasingly bizarre space for the student, where things happen that have nothing to do with what happens in the rest of society". It seems as if there was no change in the past 30 years. The application exceeded the system. In addition, tells us in a general aspect, this is be a very serious matter, "We are teaching students 21st century with 20th century professors in universities of the 19th century". The need of a new theoretical framework that meets the 21st century student learning needs is a high priority for the whole society.

We can see a trend of governments around the world to find new ways to teach students. For example, the use of technology-computers, video conferencing, Web3.0 - incorporated into the classroom- is very popular at this time [8]. Proposals for distance education, online education, semi-schooled etc. are being developed as well. The development of a new framework that satisfies the need of the digital natives at school is a challenge for any organization. Unfortunately, we are behind of covering satisfactorily the education needs of this kind of students. They're now at college!

The educational practices, for this new generation of students, are very strange to their reality, which is why we have to propose different educational methods to be appropriate to its environment (technological) education. The merging of new educational concepts -designed for them- is necessary to support the educational process of this new generation of students.

Another key feature of digital natives is being "Multitasking" which could be defined as the simultaneous execution of two or more activities. According [9] Kirchener, mentions that digital natives have developed, through practice, the ability to quickly change task. Although this is very controversial, regarding the benefits or difficulties caused this kind of attitude, the digital natives tend to do that act between them busy.

The search for a new theoretical framework to support effective learning –of this contemporary student - is urgent. We have to realize that these students are already at college. Unfortunately, they are not in a position to come back and learn with the same framework as we learned- their social environment does not permit. The strengthening of the theoretical framework for the contemporary student must be built on two principles: 1) The technological principle - the use of technology for learning; and 2) a learning environment appropriate to their reality.

### *2.1. A New Beginning*

In recent years, online education is getting more popular in our education system. There is a great tendency of schools to offer such curricula. For example, online educational opportunities have been doubled [10]. Also, we see universities worldwide - including those traditionally conservative universities - offering online curriculum. An example is the system created by the government of Mexico: UNAD (Open University and Distance of Mexico). It offers degree programs entirely online. Thus, taking into account all these facts, we'd like to say that the future of education is online. The future of education is being pushed right now to a variety of factors, which influence directly and indirectly this trend. We must emphasize that there are some factors that are essential to direct the education in this direction: The emergence of contemporary student which require different learning dynamic and economics could make governments reduce education costs at 50% with offering online programs [10]. Leaving aside the economic part of this, the tendency of education to be offered online, we see that technology has played an important role in the development of this trend. The Internet has been one of the starting points in the online education [11]. The technological development of the Internet, now offers a great communication skill - linear, bidirectional, and interactive - for the user. The internet is supplemented with technological tools able to provide interaction between a group of people, and make this an interpretative communication experience at high-level - some might say too close to reality. For example, technological tools offered by the Web 3.0 are very popular nowadays because it offers a communication on different planes and users - including multimedia. But without doubt, the most important technological pillar of the transition from online education are social networks [12]. Social networks have pushed education - in the trend of going online - to another level. Social networks offer a virtual environment conducive to education for contemporary students (digital natives) according to their characteristics. Social networks are loaded with interactive elements that are assimilated to those used by students in a traditional society - the society in which we live [13]. The mobility of education is a very complex issue, but unfortunately it is a fact that we must research and find ways to incorporate it in a way that would be brought in the new theoretical framework for contemporary students.

### *2.2. The Social Network of Facebook*

The exploration of technological tools to be incorporated into a new theoretical framework - for contemporary students - shores in search of new concepts. Unfortunately, the development of concepts for Facebook learning environment is a long process. This action seems to be on par with the technology. We can see that the use of technology is a very quick process, sometimes do not have time to verify results. That's why it is important to make use of the existing technology that is currently marketed - popular and accessible to all-to find the implementation in each system and exploit it. This process could save us a lot of time and money, and it should be important for the development of the software –having a better application. An example of this is

the social network Facebook. Facebook seem that provides certain built-in structure that could make it possible to provide a learning environment suitable for the contemporary student - a useful and meaningful educational environment able to support, enhance or strengthen the teaching of physics. Exploring the virtual platform Facebook, which is the most popular among college students, we could say that its popularity is increasing and more students are using the platform. For this Kabilan, M. K., Ahmad, N. A.& Abidin, M. J. Z. [14] remarks that it's estimated that there are 350 million users of Facebook with 50% of them fall into the non-regular way platform, and 65 million of these come to the platform daily. Thinking the figures could we consider that: Facebook could offer a learning potential to facilitate learning of physics in college students? How Facebook facilitates the learning of Physics? Considering these two facts, the potential of Facebook of reaching a big quantity of students, and the potential to adequate the Facebook platform into students need, we could really go for discovering the Facebook's learning side. We can consider that students are very optimistic about the potential of Facebook to be using as a learning platform –especially for Physics, but what about the academic community?

In the field of physic education, we could say that researchers are not looking into this potential at all. Some believe that the potential of using Facebook as an educational tool is negligible [15]. The lack of research papers by the academic community is a fact. Even with this lack of interest, some communities work in the discovering of potentiality for education on Facebook. There are some experiments among the community which demonstrate and guide teachers how to use the Facebook in a classroom for the purpose of teaching ("The Facebook Guide For Teachers," 2013). In addition, we can find a lot of literature that can guide us to explore, meet some approaches, understand the advantages and disadvantages of using Facebook as a technological tool [16]. But, nothing has been approximated to the field of physics education. It seems that physics education researchers only work on the construction of the classic theoretical framework to frame this branch of physics. At the end, truly believe that the beginning of a new framework has been start it. We need to make an extra effort to focus the exercises to discover the potential of this framework.

We will frame this paper under the perspective of "Instrumental Genesis". The complexity and lack of in-depth studies are some of the key features that characterize the Genesis instrumental theory. Nevertheless, despite being an emerging theory and under construction process, the instrumental genesis has served to validate certain elements that were measured in the primordial nature in the use of technology as a learning tool.

### *2.3. The Instrumental Genesis*

To introduce the Instrumental Genesis as general theory in this experiment, let's concentrate on the origins of it. The beginning of this theory is conducive to the search of the relationship between learning and the tools used for its process -the influence of the tool in learning process. Vygostky [17] mentioned that theoretical tools mediate the learning process. This proposal -which probably started the origins of this relationship- is the focus for subsequent studies performed by Rabadel [18] which are the basis of this document. Several authors have taken this framework to conduct research in an instrumental approach. We could highlight the work of Artigue and Trouche [19, 20].

Most of the research concerning the conceptual framework of "Instrumental Genesis" is based on studies of mathematics education. Because of this, we must emphasize that the implementation of Instrumental Genesis tends to evolve into other education areas such as Physics Education; there is a great potential of application due to factors such as the modernization of education and the emergence of a new generation of students –the digital natives.

Now, let's begin to describe in a deeper fashion the "Instrumental Genesis" theory and its application attributes. Broadly speaking, accordingly with Trouche, [20] we could consider that the transformation of the artifact into an instrument, where the idea of the instrument is the result of a construction shape by the user under instrumentalisation and instrumentation process, this is called The Instrumental Genesis. The instrumentalisation is a recognition of the functions of the artifact and the instrumentation is an idea, a mental construction ingredient when the user uses technology and brings it to develop and understand their mathematical activity [20]. On the other hand, we can also mediate Instrumental Genesis as the development moment about the usage of the artifact by the user in a productive way, a number of schemes converge instrumentation. Guin D. &Trouche L. [21] and Trouche, L. [20] told us that the development process of understanding the conversion of the artifact into an instrument is a long and difficult process to understand. The schemes of use are those that could presume to be related to the artifact. Considering some examples of them, we could say that they are the attributes or users' skills depending on the use of Facebook, such as entering text on walls, photo uploads, etc. An experienced user in the use of Facebook could use these schemes accurately, but an inexperienced user should pay attention to the attributes of the Facebook's functions and also in the conceptual aspects of Facebook. The instrumented actions correspond to the realization of the transformation of an object with the activity; in this case, they are Physical entities such as formulas, graphs, definitions, concepts and so forth. Instrumented action schemes have a mind meaning and they're constructed on based on basic to the elemental scheme of use throughout the process of Instrumental Genesis [22].

How this theory is applied using Fb? Cedillo [22] proposes an example of instrumented action to us. In this interpretation, the author says:

*"An example of instrumented action is the determination of the scale to observe a graph on a calculator. To be developed instrumented action scheme like this, it is necessary that the user possesses technical skills to set the dimensions of the*

*window you will see the graph, mental abilities that allow you to imagine the calculator screen and a clear vision of how it can be presented in the window that displays the graph in an infinite plane. Where the position and size of the window is determining whether or not we can see what we are interested in this plot."*

Reviewing this example, we can find two elements that are the basis of Instrumental Genesis. The first element is the use scheme. Technical skills needed for using the calculator obey to the principle of use schemes. The user must have some skill to operate the artifact. This is shape by a prior experience using the artifact. For example, watching others in the use of the artifact. In other words, the ability or experience from the user in handling the functions of the calculator. The second element, discussed in the example, refers to the mental ability to interpret the concept through the screen. This principle reflects instrumentation; the ability to imagine the concept and its interpretation on a screen as the result of an instrumentation, which was able to give the skill to the users for a conceptual interpretation.

Good example, but still some doubts!

Let's try another one more time on an instrumentation process example -a short case of study [23]. In this, we experience in the drafting of a document (a word processor) without considering the hermeneutic aspect involved in this process. Here exist two points, the first order of use that is going to help the process of using the word processing artifact. The user has to have some experience using the application; for example, knowing "menus", attributes, modifiers, etc. This scheme of use may depend on the skill of using a word processor and the use of the word processor by itself-a long and tedious time. In addition, there was developed an instrumented action scheme. This would put it in the way that the user has the ability to understanding the idea in which he/she work. That is, when a user types in a word processor, the user has a limited access to the wording. In a different angle, the user, when writes, can only see one third of a page, this could reach only one paragraph of the idea embodied in the document; this is how the manipulation rests on the idea developed in the user's mind. The whole argument for the creation of the idea and its written submission lies on the concept of writing. The drafting process that requires for writing a paper, the technique, style, review, etc., are in the user's mind, but are part of the writing process in a word processor.

Yes, beautiful examples but, how can I Interpreting the Genesis Instrumental at Facebook level?

## 3. The Instrumental Genesis and Facebook

Knowing that Facebook will be use -in this experiment- as a technological tool for learning, the proposal is as follows: in order that an instrumentalisation process exists by the use of Fb as technological tool, the student of physics must undergo a schematic of use process. This scheme is channeled in two dimensions, first, the pattern of use. This will be responsible for the management of the Facebook platform for maximum utilization. That is, contemporary students, as described priory, have a knack for using digital tools- Facebook for example. This ability will make them understand in a more extensive way the Facebook platform. In other words, the pattern of us-part of the instrumentalisation process- will be given in the act of management the capacity of the Facebook platform.

The development of the ability to use Facebook as a learning platform –how to use menus, how to use chartrooms, writing on the wall for discussion in an academic way -are the results of the implementation of schemes of use in an instrumentation process. It has been presumed that contemporary student (digital natives) no experiences scheme of use; they are directly related to the artifact.

One feature of contemporary student (digital native) is the use of technology. The contemporary student is immersed in a technology environment in their daily lives. At all times and everywhere, they have technology around them. Their environment is in a constant use of technology [24]. This part of the use of technology can indicate a breakthrough -about the instrumentation process- in the use of technology. This is, the factor of schemes of use of a contemporary student not exist due to the relationship of digital natives and technology. Moreover, in some way, We could said that the use of Facebook is for many of them, an instrumented act –meaning that they don't have to go through instrumentation process all the time when they use technology –probably they are in the top of the use technology. Using Facebook, for many contemporary students was a product of a relationship of factors that followed by a social practice eventually resulted on an instrumentation process. To use the platform Facebook around the digital natives -as a social network- stepped into an instrumentation process. Thus, their constant action gives them the tools to convert Facebook into a social instrument of communication. From that moment, the Facebook platform went from being an artifact to become an instrument that allow them to co-exist in a virtual fashion–socializing and communicating. The instrumentation process exists in a certain way and helps them socialize virtually.

Now, if so, it would be important to migrate the existing framework and focus on the learning achievement in Physics Education aided with technology. Then, coming back to the second dimension –of the instrumentation process- is necessary an instrumented action category. It is eminent that Facebook offers a wide range potential of applications. Although its function - as a social network - is other than educational, this application offers great potential to be applied on physics education. Facebook offers three essential elements-bearing in mind that the platform has more elements- for implementation. These are: "Wall", "Notes" and "Events". The development of an instrumentation process capable to overcome these three elements, incorporated into FB, are the basis of the instrumented actions and are in charge of providing users the instrumented action schemes necessary for the process of instrumentation. Then, these

three elements are exploited in such a way the students will be provided themselves with elements to create the idea of the studied concept. In this way, students in the process of adoption, create a conceptual idea enough to support the learning of Physics by the usage of Facebook platform –this mean creating an instrumentation process. This action is similar to the one that is been taking place in a social network, in which the contemporary student will be able to abstract the physics educational content for its use. In other words, the use of these three elements, under the platform of Facebook, develop mental skills that will enable students to imagine (idealizing) the representation of an educational concept - in this case the PV theory. Thus, the instrumentation process will be implemented. In this case, the representation of learning objects of Physics-like study elements- and the reasoning process of these objects under a given structure giving using the platform Facebook is considered as the abstraction process of the Instrumental Genesis.

### *3.1. The Learning of Physical Sciences Under Facebook Setting*

Regarding the research of teaching physics under the parameters of Facebook, we can see that is very minimal; it is very limited. The research that has been generated about it lack factual elements that we could considering them with rigorous character for their application under the new curriculum format. Many cases, most teachers agree on if we could integrate the first part of teaching physics virtually online and then students, physically, make physical phenomena experientially. It could be a responsible approach that many teachers could support [25].

Although the teaching of physics through Facebook is almost zero, we could make some reference from works that although they have not been designed for teaching physics they have generated some resources for science. In particular, Facebook appears to provide a ready space where the 'role conflict' that students often experience in their relationships with university science work (Selwyn, 2009) [26]. Abu-Alruz [27] postulate that participation in online Facebook learning activities to communicate with their classmates and the instructor for educational purposes, such as inquiring about course requirements, including course syllabus, exam dates, assignments, and for project requirements. In order to get these skill, Alhzmi and Rahman [28] suggest supporting science classes with the interactive and collaborative features from Facebook.

Learning photovoltaic theory (PV) has not been of great relevance among engineering and science students until today. Its significance in their study is due to the implementation of renewable energy and the development of elements of non-traditional industrialized energy in recent times. This will emphasize that certain physical concepts, such as the teaching of the PV theory is intended to be taught from other non-traditional point of view we are used to study the physical science. According with (Ghosh, Fishman, & Feng, 1980) [29] the study of the PV theory in universities obey to the development of an industry in which has a potential to generate a new generation of power source at an industrial level. Therefore, the development of photovoltaic theory within physics curriculum had been increasing in an impressive manner. So right now, we can see different frameworks for the teaching this theory. For instance, in their experiment, (Schauer, Ožvoldová, & Lustig, 2009) [30] proposes the teaching of photovoltaic theory through a system of distance learning called INTe-L.

Currently, there are a great variety of attempts to find the best way to teach this specific subject, in some cases in a very particular way. For example, the work of Freeman [31], he developed a total virtual laboratory for the study of the PV Theory. He mentions that remote triggered laboratories are an excellent way to provide access to costly labs and equipment for students in areas without such facilities.

### *3.2. Photovoltaic Theory Learning and Facebook*

For this study, the learning of the PV Theory in the Facebook virtual environment, has been set up a serial of subjects related to the PV Theory. The academic curriculum was modified to cover the learning of the PV theory in a virtual way under the virtual platform of Facebook. Although the curriculum has been re-formulated; the topics to be developed from virtual tide were chosen under the features and potential of being embedded under the categories of Facebook tools. At the end, the subjects to be covered required by the curriculum were not modified or excluded; the class core remain intact. For this purpose, the teaching of curriculum in the social network of Facebook was introduced as follows.

Exploring the capacity of Facebook to generate a real worthy environment to sustain a lecture of the photovoltaic theory has been an interesting fact. The lack of straight examples has been an issue to overcome. Cue to this constrain the modeling of this experiment were constructed in a combination of different approaches develop among some authors. For example, the experiment executed by McKagan, Handley, Perkins, & Wieman [32] explain how was developed a curriculum on the photovoltaic theory aided with computer simulation. In this experiment shows and explain some interesting approach about the virtual interactive lectures with peer to peer instruction and mathematical homework problems. On figure 1 is show an example of this setup for virtual instruction of the photovoltaic theory.

Probably the most influential model to teach the photovoltaic effect over Facebook was the one called digital story telling developed by Sweeney-Burt [33] but in a virtual way were showing by (Kotluk & Kocakaya, 2016) [34] years later. In this approach, we found the necessaries paths to conceive our curricular setup of Facebook academically. This framework claim that is capable of creating a classroom environment virtually, allowing the students to be active learners, creating communities, fostering communication as well as providing students with technology literacy [35].

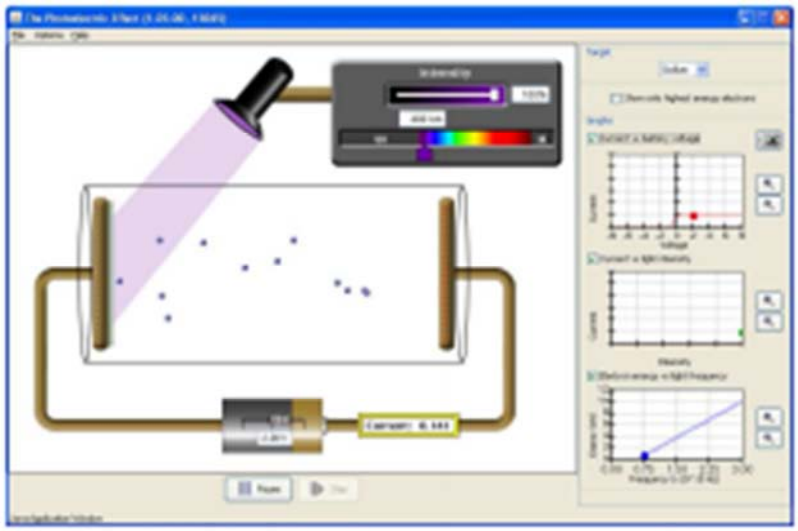

***Figure 1.*** *The photovoltaic Effect. Simulation.*

# 4. Methodology

### *4.1. Photovoltaic Theory on the Facebook Platform*

For Hersch and Zweibel [36] the photovoltaic (PV) effect is the basis of the conversion of light to electricity in photovoltaic, or solar, cells. Described simply, the PV effect is as follows: Light, which is pure energy, enters a PV cell and imparts enough energy to some electrons (negatively charged atomic particles) to free them. A built-in-potential barrier in the cell acts on these electrons to produce a voltage (the so-called photovoltage), which can be used to drive a current through a circuit. This description does not raise the complexity of the physical processes involved [36]. Although it is impossible here to cover fully all the phenomena that contribute to a PV-generated current, it is possible to go deeply enough into these phenomena to understand how an effective cell works and how its performance can be optimized [36].

The arrangement of this topic to be implemented in the platform was analyzed in a certain way to be able to align and summarize it. This in order that its content is relevant and does not lose any of its curricular objectives when it is covered in a way synthesized in the platform. We must remember that although social platforms pretend to be of great potential to communicate, we must also understand that there is no rivalry of these with spoken language. That is, Facebook's social network has limitations on communication. These limitations are very important for the development of very abstract concepts. For example, in a normal class to be covered such subjects the potential for questions to exist would be very high That is why for this work, how to implement the teaching of photovoltaic theory on the Facebook platform was done in a way to answer the potential of questions that could bring these types of topics. We can do this by answering some fundamental questions about processes central to the working of a PV cell:

1. What does it mean to say that an electron is freed?

a. Where is it freed from?

b. Where does it go?

2. What is the potential barrier that acts on the free electrons?

a. How is it formed?

b. What does it do?

3. Once acted on by the potential barrier, how do the free charges produce a current?

This elementary Physics course covers the basic history concepts and principles of physics. This course will give to students the fundamental of physics topics -mechanics, heat, light, sound, electricity, magnetism, and modern physics.

The principal outcomes for the course are frame as follow:

1. Assess the role of science, and in particular, physics, in helping us to better understand the complex, technological society of which we are a part.

2. Trace the history of physics and the evolution of scientific thought from ancient to modern times.

3. Define and analyze the concepts of velocity, acceleration, force, inertia, mass, work, energy (kinetic, potential, etc.) momentum (linear and angular), gravity, tides, power, pressure, density, temperature, thermal expansion, heat, specific heat capacity, waves, sound, electric charge, current, magnetism, electromagnetic waves (including light), photons, and radioactivity.

4. Discuss the various types of motion, Newton's Laws (including his Universal Law of Gravitation), the conservation laws of physics, the laws of electricity (e.g. Coulomb's and Ohm's Laws) and magnetism. The properties of waves (viz. sound and electromagnetic, including light) and the basic principles of atomic and nuclear physics, relativity and quantum theory.

5. Solve a variety of basic problems in particle kinematics (uniform motion and accelerated motion including "free fall"), dynamics using Newton's Laws of Motion and the conservation laws of energy and momentum (e.g. collisions),

fluid mechanics (including Archimedes' and Bernoulli's Principles), thermodynamics, wave motion, basic electricity (Coulomb's and Ohm's Laws), and radioactive decay.

6. Interpret the results of simple experiments and demonstrations of physical principles.

For this experiment the chosen topic to be analyzed was the one belongs to the topic of Atomic Physics.

| Topic venue | Subject. Chapter 7. Atomic Physics |
|---|---|
| a. | Blackbody Radiation. |
| b. | Quantum Hypothesis. |
| c. | Photovoltaic Effect |
| d. | Atomic Spectra. |
| e. | Borh Model of the Atom |
| f. | Atomic Structure |

Now, setting up the material to be carried by Facebook we constrain with two elements unseen elements. The first one, flexibility of the curriculum. The benefit of teaching material that coming from a specified curriculum is a hard topic, Due to the school's educational specification and school policies the deviation on the curricular activities lack of flexibility. That means that options to be wider or condensing the matter of the subject are minimal. Exist some procedures for accomplish that kind of actions. Unfortunately, this is a very tedious effort. At the end, the teaching on the subject are supported by the instructor discretion. The only requirement is maintaining the structural main-topic curricular objectives in the way of supporting required outcomes and there is no problem. The second constrain to corroborate with the integration of the curriculum into the atmosphere of Facebook is the copyright issue.

On the other hand, curriculum recommendations are very simple steps that help us to fulfill curricular requirement under the school protocols. For this experiment the way to teach the subject -the traditional way was recommended-. The means under the experience of curriculum developers was the best way to teach these topics because we will use the influence of our school educational structure. The applied methodology, must include elements in the order of lecturing, discussion, and slide presentation. As we recall, these elements have been questioning for the insufficiency capacity of motivate students as well as the lack properties for creating a proper learning environment no just to the new students but also in a traditional class setup -peer to peer classes-. At this point the importance of educational methodologies into a virtualization facade is a fact. For this experiment, we followed the required means of methodology but just in a different environment -the virtual environment.

The preparation of the theme of theory. The Dynamic in the social network of Facebook was done as follows:

Only tools typical of the Facebook platform were used, that is, no additions were made to extra applications that can be added to the Facebook platform. Facebook counts with some tools that will empower the supporting of elements required by curricular instruction methodologies -lecturing, discussion and graphical interventions. To satisfy required methodologies in the order of lecturing, we utilized two proper tools from Facebook. The first one give us the opportunity of an extended area for the publishing of date in a combination with graphical representation. Believing that the major asset of this tool is the instant synchrony communications that offer to students, and moreover, this specific tool is the only one tool that appear by default in all mobile Facebook platform on the different existing commercial platform. So, student won't get any confusion at the time of using the Facebook platform on their mobile devices no matter what is the origin of it. The second tool from Facebook that was used for lecturing is notes tool. This tool is able to hold a small 145 characters. This tool was used for special instruction that students must follow before they continue with the discussion part after lecturing.

For the discussion of the lecture -action that had been require for curricular compliance- the tool that support a supportive and strong discussion forum was the Facebook "wall". The characteristics of this "Facebook's wall" allowed students being in contact communication with all student at the same time. This is, instructions given to participate on the discussion of the topic review was mandatory. Replays from student were demanded. This action were instantaneous messages among the class -50 people being communicated and replying back and forth at the same time. The potentiality of this tool, such as carrying graphics, videos, pictures etc. is without no doubt the major asset of Facebook, even do, it is used socially or educationally.

Another used tool from Facebook that were used in the experiment was the use of Videos Tool. As a result of the need of using graphical aid, the videos tool will support the carrying of videos for viewing by students. The potential of this tool is very big. This tool has the capacity of support videos to be streaming by the user of Facebook in a very low streaming bandwidth capable of being reached by all the member of the group. The approach worked here was the one that a small open source video was required to support the lecture given previously.

Having in consideration that Facebook has the capacity of work with a variety line of tools, for this experiment we just considering the usage of proper tools. This is, we leave out the possibility of experiment with paid-to use tool. As we discover, Facebook have a huge community dedicated to the development of tools that can be used to enhancing the Facebook experience. Most of the developer claim that developed tool is in the range of comply with a better experience at the time to be combine whit the usage of Facebook. Although there were a lot of application with a specific educational use, the aim of this experiment is the identification of the virtual environment that Facebook by itself offers for the academic community.

The first step includes an introduction that was disseminated among all members of the class. The following figure shows the first unproductive approach to photovoltaic theory on the Facebook platform.


***Figure 2.*** *Introduction to the course.*

The following figure is shown in the introductory part of the photovoltaic theory on the Facebook platform.

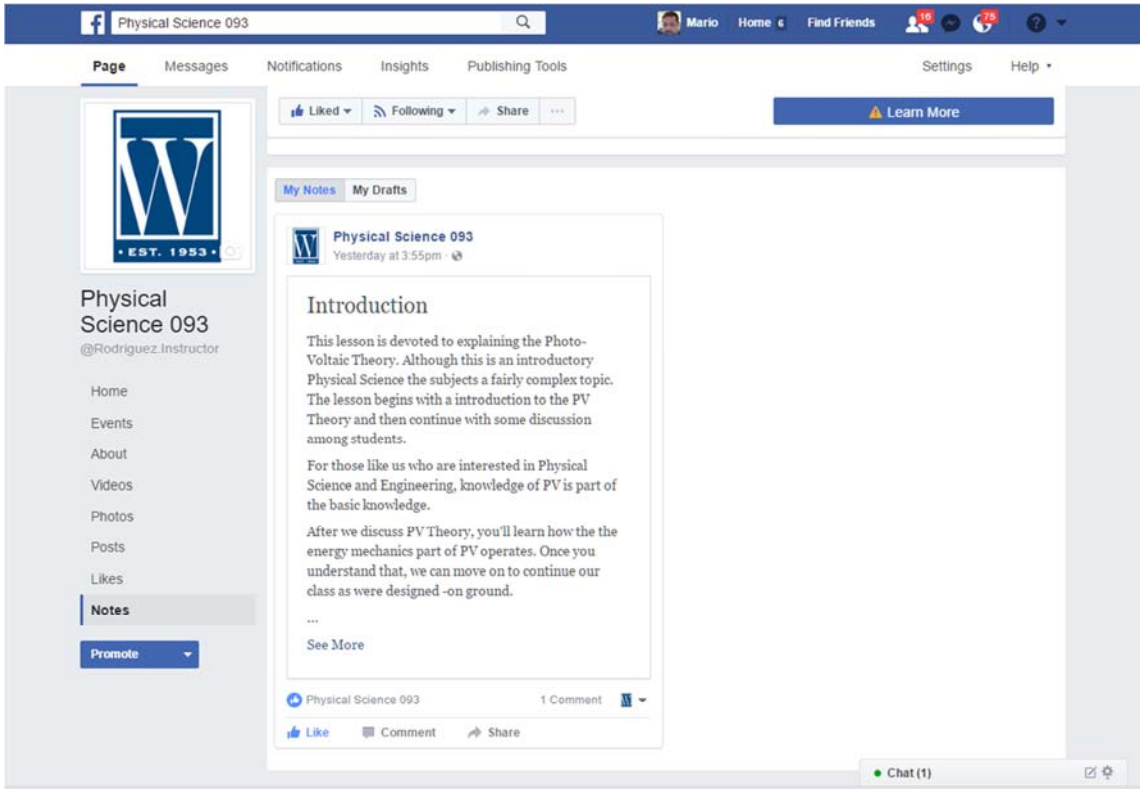


***Figure 3.*** *Facebook Introduction class section.*

The following figure shows the number one part of the practice. The theoretical part.


***Figure 4.*** *Facebook Theoretical section.*

The following figure shows the second complementary theoretical part. This shows a video in which the theoretical part is shown in a graphical way.

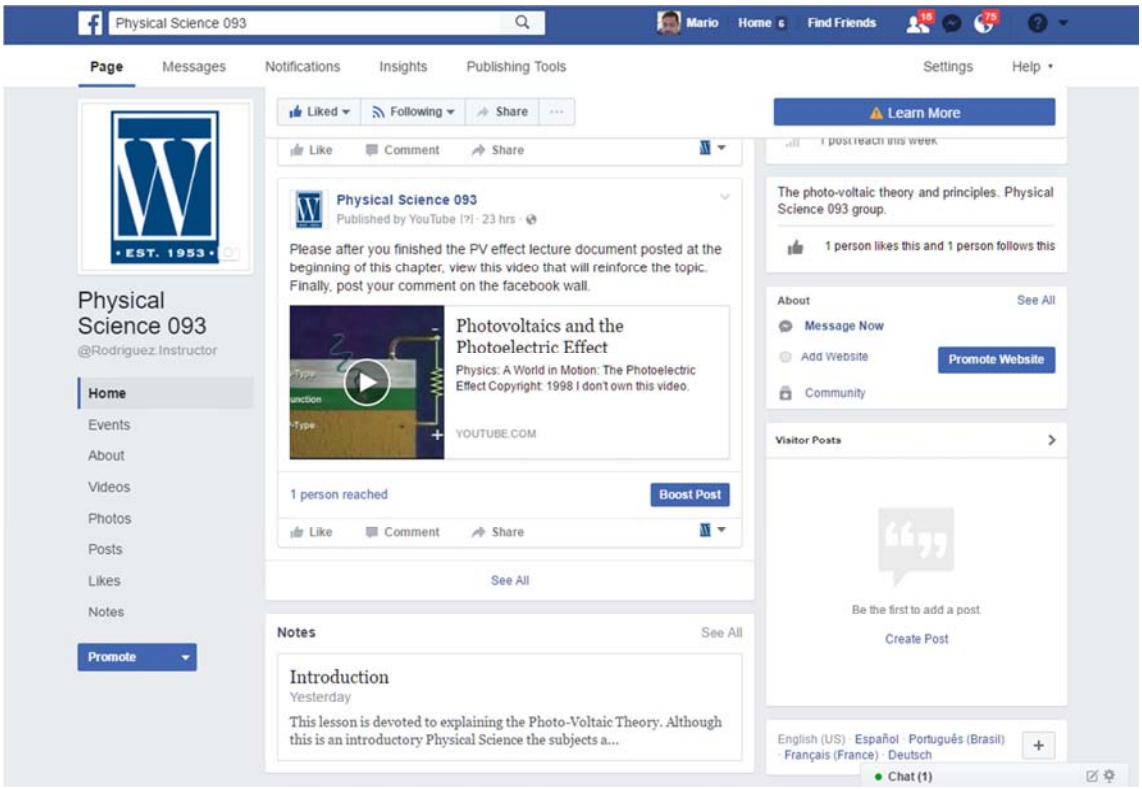


***Figure 5.*** *Facebook Class Video Section.*


***Figure 6.*** *Facebook Feedback Section.*

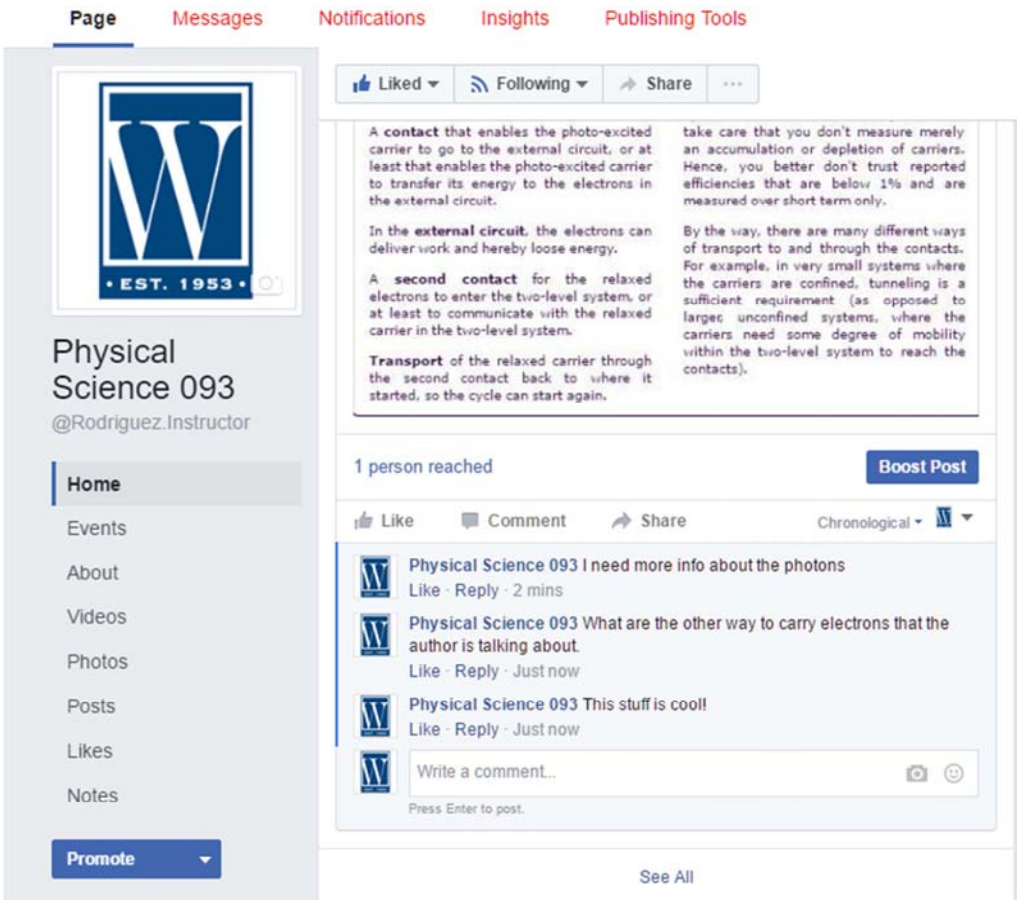


***Figure 7.*** *Facebook Wall Section.*

### *4.2. Case of Study*

For this experiment, it is presumed that a qualitative research will lead us to the finding of student's conceptions regards the use of Facebook as virtual platform that enhance the learning of Physical Science. Also, the descriptive approach of this research will perceive and construct the instrumental schemes developed by students at the time to be expose to the use of Facebook in an academic fashion.

For this study, we had the participation of two groups of freshmen college students. For these students, it was required at least two science courses to fulfill the requirements of their academic line where they are involved now. The first group consisted of 25 students in which 60% was in the position to take credit courses for advanced engineering. In the other group was only 25 students of humanities educational area. We gave them a questionnaire, which should be filled on the first day of the class. In this questionnaire, we administered the inquiry on the use of Facebook. This questionnaire inquired questions about the demographic situation, the use of technology aspects of motivation in school and to what extent they were interested in participating in this experiment.

For this work, we created questionnaires for the investigation of Facebook under many angles as a social network also, its relationship with the internet for its use in an academic way.

In this experiment, the Likert scale's inquiring section core are constituted by three sections that have the purpose of recovering conceptual scenarios as well as the extraction of instrumental genesis theoretical elements; it has the need to be extended. Therefore, the need of organizing a preamble to approximate student into the required context was a need to be addressed. This will aid the inquiry section of the Likert scale to be closely factual, as we desire. Supplemental Questionnaires in the order of inquiring the relationship among the internet, Facebook and technology were developed. These questionnaires will bring up the contextual preamble need it for the recall of an enhanced conceptual inquiring.

Approximating questionnaires will be given to participants to be answered. The questionnaires will be exposing the preferences from students in the ambit of Internet usage habits, Facebook usage habits and technology preferences.

The experiment will hold a maximum group of 25 students from the physics class; this is the way that the ground class of physics is been run by a physics instructor traditionally at the school. In this class. The instructor will be provided with technological tools such as the Internet, which will be integrated into the virtual platform Facebook. The course is scheduled to be instructed for 16 weeks and this will be carried out in the fall of 2015. During the course, students will be informed about various social networks and Web 3.0 tools.

For this step of the experiment, a close question methodology will be applied. The first question has the responsibility of finding the perception of the use of Facebook academically. For this, the accomplishment must carry out the inquiring of probing or disapproving the model in which students can learn over the Facebook platform. Moreover, it is important understand how students are using the social network Facebook for academic purposes. The most effective way to inquire about Facebook conceptions in the academic aspect is start students exercising on it [37].

The instrument used in this survey will be a questionnaire. In the first part of this questionnaire, we will ask the student his/her gender and demographic information. The second part of the questionnaire consists of interrogating students about their practices on the Facebook platform –approximating questions. Here will be 10 questions in which the getting of conceptions enables students and their perception for the use of Facebook with an academic purpose.

With this questionnaire, we will pretend to interrogate participants about the general usage of the internet as well as the usage of the Facebook for general and academic purposes. This approach will be generating information that is related to the conception of how the students perceive the use of the virtual platform of Facebook in a different way as it was intended priory. There is a division of questions intended in the purpose of two meanings. The first one is evocated with the intention of look around the perspective of the use of the internet in the academic world. As we recall [38] in their job, students been exposed to the internet at the time of the scholastic activities tend to be distracted from the purpose of their exposure. In some occasions the notion of being in could be no differentiated. Thus, students are practically expose all time to the internet. At the time of the class, at work, and home. They can be existing on both sides without the specific meaning.

The purpose of the second part is mark a line between the use of Facebook and the use of the internet. It is important for them and for the result of the experiment that they understand the marked line. The division of questionnaires were provoked for the differentiation of answers. The student must understand the difference of being on Facebook under an academic purpose and the other side, the participation over the internet on a general fashion. For this construction of knowledge aims to use the scale of 5 levels Likert.

On the other hand, observations would see more than a simple view. For this experiment, we propose a very simple methodology called "simple observations", observations are relatively simple to carry out. They can be control it easily and very often they can be very time consuming. They are several strengths about the use of this method for collecting data. We will be able to collect information in its own flow of behavior. This is that observations will be made at the point of being generated. Due to the nature of the framework (Instrumental Genesis) is necessary the seeking of elements on their own environment. In addition, another important strength of this method is the capability of generation new ideas. This specific method could give the researcher the ability of study the total scenario. In this way, researcher is

exposing to a new venue that probably were not expose at the time when the experiment was designed. Again, the use of this new developing framework has the need of have a better scenario for observations. Instrumental schemes are difficult to observe, so in this way, the use of this method will be great for the seeking of these type of elements.

As is propose by Guba [39], this methodology offers alternative strategies for problems when the experimental approach is implausible. Discovering instrumental schemes will be the work of this methodology.

Furthermore, expressing satisfaction regard the use of Facebook in academic way is not a simple task. For this, it is important to have a clear idea of the satisfaction on terms for the using of Facebook. Expressing ideas more openly is a characteristic of this kind of approach. Open question often is used to answer complex questions.

# 5. Results

As explained before, the research was carried out in two groups of 25 students each. The first group consists of 78% female students and 22% male students. The second group consists of 82% female students and 18% male students. As we can see, the majority of participants are female.

Regarding age, the two groups of students were attending their first year of school and are representative of the digital-native digital generation. In both groups the percentage of ages was: 76% of students of 18 years and 24% of students of 19 years.

With regard to academic guidance, 98% of the students replied that they had not decided on their academic orientation and that they would continue to take only general education classes. Only 2% stated with certainty that their academic orientation is medicine.

Regarding their grades, 100% of the two groups answered that their Grade Point Average (GPA) was greater than 3.5. This result seems logical due to his short career in the school and the few units attended as a freshman.

Regarding the time students are connected online. The students of the two groups combined, told us that 16% spend more than an hour studying after school. Twenty-six percent said they spend more than two hours and lastly most, 58% spend more than three hours studying outside of school.

In order to have a clearer conception about the students' idea of the academic use of Facebook, it was important for this experiment to emphasize only the use of this social network, focusing on its use as a virtual learning tool, differentiating it from the use of the internet, so that, students did not mix conceptions. For this reason, the questionnaire presented to the students was divided into two parts, the first about the use of the internet and the second part dedicated to the use of Facebook. These questionnaires were used so that the student did not confuse the actions of Internet and those of Facebook, so that he could identify the function that gives each tool.

As we understand, the extraction of conceptions about representations of the use of Facebook as a virtual tool is a very delicate work. For this, in this experiment, we tried to investigate how the student relates the exclusive and habitual use of social networks with his academic work. That is, academic work in social networks is a reflection on the interaction that students have to enhance the use of Facebook as a learning tool. The following are representative questionnaires of students' conceptions about the use of Facebook as a virtual tool for the education of physics.

Table 1 shows the students' conceptions about the use of the internet and their relationship with the academic part, obtained from the first questionnaire. As we can see 50% of the students are validating that the use of the internet has not in any way harmed the academic environment. In this survey, we have (STD = 7.47) and a (Median = 7.2).

***Table 1.*** *Internet and Academics.*

| **The Internet and Academics.** | | | | | | |
|---|---|---|---|---|---|---|
| **Survey Questions** | **n** | **Strongly Agree** | **Agree** | **Neutral** | **Disagree** | **Strongly Disagree** |
| The Internet distracts me from studying/doing schoolwork. | 50 | 15 | 15 | 1 | 7 | 12 |
| I use the Internet to procrastinate when I should be studying/doing schoolwork. | 50 | 21 | 2 | 6 | 15 | 6 |
| The time I spend on the Internet takes away from studying/schoolwork time. | 50 | 25 | 16 | 2 | 5 | 2 |
| If the Internet did not exist, I would get a lot more studying and schoolwork done. | 50 | 7 | 21 | 4 | 8 | 10 |
| I have missed a class because I was on the Internet. | 50 | 0 | 0 | 5 | 40 | 5 |
| I would be getting better grades if I spent less time on the Internet. | 50 | 15 | 10 | 10 | 3 | 12 |
| My grades are suffering because of my Internet use. | 50 | 20 | 5 | 7 | 17 | 1 |
| I am able to control my use of the Internet so that it does not interfere with studying/doing schoolwork. | 50 | 4 | 17 | 3 | 20 | 6 |
| When I am doing research for a course, I primarily use the Internet as a source of information | 50 | 19 | 5 | 11 | 9 | 6 |
| Overall the Internet has had a positive impact on my academic performance. | 50 | 20 | 4 | 1 | 3 | 22 |

Table 2 shows the results, also based on the Likert scale, used to investigate students' conceptions of Facebook usage. In this table, we can see how the social network of Facebook has a great relationship in the academic life of students, and there is no problem in the use of it. We can also see the great acceptance of the use of Facebook as a virtual learning tool, there is even a great acceptance for the use of Facebook in the field of teaching physics. This survey gave one (STD =

4.39) coupled with a (Median = 10.67).

***Table 2.*** *Facebook and Academics.*

| **Facebook and Academics** | | | | | | |
|---|---|---|---|---|---|---|
| **Survey Questions** | **n** | **Strongly Agree** | **Agree** | **Neutral** | **Disagree** | **Strongly Disagree** |
| Facebook distracts me from studying/doing schoolwork. | 50 | 5 | 12 | 14 | 6 | 13 |
| I use Facebook to procrastinate when I should be studying/doing schoolwork. | 50 | 7 | 13 | 9 | 10 | 11 |
| The time I spend on Facebook takes away from studying/schoolwork time. | 50 | 4 | 11 | 15 | 15 | 5 |
| If Facebook did not exist, I would get a lot more studying and schoolwork done. | 50 | 14 | 8 | 5 | 14 | 9 |
| I have missed a class because I was on Facebook. | 50 | 12 | 2 | 14 | 7 | 15 |
| I would be getting better grades if I spent less time on Facebook. | 49 | 18 | 12 | 4 | 2 | 13 |
| My grades are suffering because of my Facebook use. | 50 | 12 | 3 | 12 | 13 | 10 |
| I am able to control my use of Facebook so that it does not interfere with studying/doing schoolwork. | 50 | 8 | 13 | 6 | 12 | 11 |
| I have had to wait for a computer at the TECH Center or library because other students were on Facebook. | 50 | 11 | 23 | 1 | 9 | 6 |
| I use Facebook to communicate with classmates about course related issues. | 50 | 16 | 8 | 10 | 2 | 14 |

Table number 3 represents the use of Facebook in a particular way. In this table, we try to recreate possible scenarios in which students could be affected in their personal existence by the simple fact of using the Facebook platform. In this questionnaire, we can see a neutral tendency. That is, students have found the appropriate medium for the platform to be a part of their life and not vice versa. In this survey, we have one (STD = 4.39) and one median (10.66).

***Table 3.*** *Facebook Use.*

| **Facebook Use.** | | | | | | |
|---|---|---|---|---|---|---|
| **Survey Questions** | **n** | **Strongly Agree** | **Agree** | **Neutral** | **Disagree** | **Strongly Disagree** |
| Facebook has become part of my daily routine. | 50 | 8 | 14 | 11 | 8 | 9 |
| I log on to Facebook and check it regularly whenever I am on the computer. | 50 | 2 | 6 | 12 | 1 | 29 |
| I lose track of time when I am on Facebook. | 50 | 11 | 8 | 17 | 8 | 6 |
| I have tried to cut down on my Facebook use. | 50 | 16 | 2 | 6 | 15 | 11 |
| I would be upset if I were no longer able to use Facebook. | 50 | 7 | 13 | 5 | 14 | 11 |
| Sometimes I go on Facebook while I am in class. | 50 | 15 | 15 | 13 | 1 | 6 |
| When I am not on Facebook I find myself wondering what I am missing. | 50 | 18 | 10 | 1 | 12 | 9 |
| I think I might be addicted to Facebook. | 50 | 13 | 13 | 8 | 16 | 0 |

In table 4, another aspect that this experiment intended to extract the contribution of the internet to the student's life. Thus, the use of the internet could affect the student's daily record. Let's take into account that there is a double interaction between the use of Facebook platform, the association of virtuality by Facebook and the association granted by the internet as a means of coexistence. As we see, students were inclined to answer the questionnaire in a conservative way in which no inclination towards a favorite side is shown. (STD = 8.34) and Median (7.2).

***Table 4.*** *Internet use.*

| **Internet use.** | | | | | | |
|---|---|---|---|---|---|---|
| **Survey Questions** | **n** | **Strongly Agree** | **Agree** | **Neutral** | **Disagree** | **Strongly Disagree** |
| I lose track of time when I am on the Internet. | 50 | 12 | 15 | 3 | 6 | 14 |
| I have tried to cut down on my Internet use. | 50 | 21 | 2 | 6 | 15 | 6 |
| I would be upset if I were no longer able to use the Internet. | 50 | 25 | 16 | 2 | 5 | 2 |
| Sometimes I go on the Internet for personal reasons while I am in class. | 50 | 7 | 21 | 4 | 8 | 10 |
| I think I might be addicted to the Internet. | 50 | 0 | 0 | 5 | 40 | 5 |

Continuing, in table 5 shown the inquiry about the Facebook's conception to support an academic achievements intrinsic dimension by itself. The panorama of the answers by students were giving with a really inclination to be a positive tool for the learning of the Photovoltaic theory. As we see, most of the questions are very favorable inclination to be Likertly "Strongly Agree" with the exception on one, the one that is asking about the future of the platform to follow being using as the major internet platform for academic purposes. For this question, they decline to be the next big thing. The (STD= 8.9) and the (Mean=8.5).

***Table 5.*** *Table enquiry about conceptions.*

| **Table enquiry about conceptions** | | | | | | |
|---|---|---|---|---|---|---|
| **Survey Questions** | **n** | **Strongly Agree** | **Agree** | **Neutral** | **Disagree** | **Strongly Disagree** |
| Do you believe that Facebook offers a virtual environment for the learning of the photovoltaic theory? | 50 | 32 | 5 | 8 | 5 | 0 |
| Do you believe that Facebook is able to go beyond over its purpose and help you to enhance your academic performance? | 50 | 19 | 2 | 6 | 15 | 0 |
| I agree that the academic side of Facebook is a strong tool that all academic institution must use for academic purposes? | 50 | 22 | 16 | 2 | 5 | 0 |
| Do you believe that Facebook have a stronger relationship with your academic performance? | 50 | 16 | 21 | 4 | 8 | 0 |
| Do you recommend the use of Facebook for academic purposes? | 50 | 12 | 0 | 5 | 40 | 0 |
| Do you believe that Facebook is the best platform for learning online? | 50 | 32 | 10 | 10 | 3 | 0 |
| Do you believe that Facebook has the proper tool to support the leaning of Physics in a virtual environment? | 50 | 19 | 5 | 7 | 17 | 0 |
| Do you believe that academic learning over the Facebook platform is not very difficult? | 50 | 18 | 17 | 3 | 20 | 0 |
| The use of Facebook academically can help you to upraise your grades? | 50 | 6 | 5 | 11 | 9 | 0 |
| Is Facebook the next big thing on academics? | 50 | 20 | 4 | 1 | 4 | 16 |

The conceptions of students after having had experience with using Facebook in an academic manner were positive. Some authors mention that the changes of opinion about the potentiality of Facebook change after having had some experience in the use of it. Results from the perspective of using Facebook academically focused on teaching physics are reflected in most of the tables. It is noted that about 85% of the students surveyed commented on their experience was positive. Another answer about the Facebook tools necessary for the teaching of physics through virtual means shows that 78% of the students answered positively and the rest of them were maintained in a neutral way. One of the most controversial results found in this questionnaire is the acceptance of students that the use of Facebook for academic purposes helps, to a certain extent, to have a better degree in the subject, where 60% of the respondents answered in a neutral way and 12% of them answered in a negative way. At best their conception of having a good academic degree is not the result of the use of tools but of the commitment that is put to the class. In one of the last questions reflecting the students' conceptions of Facebook use if it offers an educational environment strong enough to support a physics class, 98% Students had a positive concept, only 2% Maintained in a neutral manner. In one of the last questions reflecting the students' conception of Facebook use if it offers an educational environment strong enough to support a physics class, 98% Students had a positive concept, only 2% Maintained in a neutral manner.

The use of Facebook as a virtual learning platform although it maintained a good level of acceptance by the students, we also encountered certain difficulties that had to be faced. These same were conceived the instant in which the experiment was carried out.

The following is the questionnaire in which the students' conception and satisfaction about the use of an academic way is investigated. Table 6 gives us an approximation about the perception after using Facebook as a tool. As we can see, the positive response from the students was eminent. Also, we can see, only 2% of the students answered in a totally negative way. But in contrast the positive use of Facebook as a virtual education tool took a positive turn with 53% of the questions in the questionnaire. Only 20% of them held power plants. We can assume this result (STD = 26.66) and one (Median = 6.88).

***Table 6.*** *Post-concepciones acerca del uso de Facebook.*

| **Post-conceptions about the use of Facebook academically** | | | | | | |
|---|---|---|---|---|---|---|
| **Survey questions.** | **n** | **Strongly Agree** | **Agree** | **Neutral** | **Disagree** | **Strongly Disagree** |
| Do you have a positive experience during the learning of the PV Theory under Facebook environment? | 50 | 42 | 6 | 1 | 0 | 0 |
| Facebook offers all necessary to support a learning experience. | 50 | 39 | 2 | 6 | 3 | 0 |
| Facebook should be using more often for academic purposes. | 50 | 25 | 2 | 18 | 5 | 0 |
| Facebook is able to support a learning environment for teaching physics. | 50 | 47 | 3 | 0 | 0 | 0 |
| I will recommend the use of Facebook for academic purposes to others professors. | 50 | 40 | 10 | 0 | 0 | 0 |
| The use of Facebook as academic tool is for the exclusive use of the learning of Physics. | 50 | 0 | 0 | 10 | 39 | 1 |
| My grades are better because I use Facebook for the learning of the PV theory. | 50 | 2 | 12 | 30 | 0 | 6 |
| The best way to learn Physic is with the aid of Facebook. | 50 | 4 | 19 | 23 | 0 | 4 |
| Facebook offers a useful and meaningful educational environment able to support, enhance or strengthen the learning of Physics | 50 | 41 | 8 | 1 | 0 | 0 |

As we commented at the beginning of this experiment, to inquire about the conceptions and experiences of a virtual activity is a complex work. But undoubtedly, these tables give us a positive panorama about the satisfaction of students in the use of Facebook as a virtual learning tool.

# 6. Conclusions

One of the purpose of this study was to discover the concept of the social network Facebook to be used as a learning environment which helps to study photovoltaic theory at university level. Another purpose of this work was to discover instrumental elements that indicate that the use of the social network Facebook facilitates the development of schemes of use which add value of using Facebook platform thus cram the learning of photovoltaic theory in contemporary students. Finally, we explored the satisfaction of students about the learning experience induced by the social network of Facebook used as a virtual platform in the learning of physics.

This study is considered as the continuation of different previous efforts to find the necessary elements in the use of digital tools. It aims to improve the theoretical framework in which contemporary students are being exposed in the learning of physics at current times. In this study, students' virtual practices in using Facebook as a virtual learning tool were considered. Also, finding instrumental elements of the instrumental Genesis order developed by the practice itself at the time of using Facebook as a virtual educational tool. These instrumental elements could reflect a better understanding of the same use of the virtual platform in a formal way for the learning of Physics. Finally, students' satisfaction of using Facebook as a virtual platform after experiencing the learning of photovoltaic theory through this route.

There are different studies about Facebook in which direct relationships are found between the virtual platform and the students called digital natives. In addition, several studies show that most people, when exposed to technology, experience some instrumental situation to give properties to this device and take it to a point where it can be an instrument. In this experiment, the case of the digital natives was visualized reflecting a complicated situation and causing controversy. Some authors reflect some concern when researching about the instrumental schemes learned during the act of digital natives exposed to a situation of the use of technology, commented that technology would seem to be part of them. There is a great relation about the characterization coming from diverse investigations, of the new contemporary's students in their social practices. So, the answers generated by this experiment kept a line very close to the characterizations previously realized in a diversity of investigations about these digital natives. This indicator puts us in a primordial situation to coincide that the results cover the context of the digital natives.

The results of this research show that there is a great acceptance of Facebook as a virtual learning platform by students participating in the study. This students' conception on Facebook indicates that its application goes beyond being the most popular social network in the world, but also maintains intricate elements that enable Facebook to support the study of photovoltaic theory in a virtual environment.

Within the dimension of instrumental genesis, the experiment showed no significant relationship to the instrumental processes developed when using Facebook as an academic learning tool. Sizing the instrumental genesis in two ways, the experiment showed that the process of instrumentalisation obeys different areas not the generated when the student is exposed to Facebook in an academic way. Concepts, variations, and modes of use were conceived in a way prior to the moment of use of Facebook academically. There are two resources valid in demonstrating the process of instrumentalisation, the first contributes to the conceptions about the contemporary students called digital natives, reiterated in this experiment. The second resource in the adaptation of the instrumentalisation process originated by the student previously. This phenomenon occurred at the time of using the virtual platform of Facebook in a social way.

The second dimension of the Instrumental Genesis is conceived over the process of instrumentation. The discovering of scheme of use to be enfolded among the

existing ones for a rapid insertion and in this way, turn the artefact into a valuable tool. So, this way, the use of Facebook will be handled instrumentally, then after, it will be embedding into the student in order to facilitate the learning of the Photovoltaic Theory virtually. As this is the case, this experiment did not give us enough vision to discover factually data to support this argument. There was not any conceiving of new elements –scheme of use- that students were able to incorporate for the use of Facebook in a new academic fashion. Developed data portraits a different dimension which make us to back up some other investigation statements. Digital Natives are natural at the time that they are expose to technology.

At the end, students' perception about the experience of using Facebook as a learning tool with a competitive platform that supported the learning of the photovoltaic theory virtually was satisfactorily positive. The change of perception about the use of Facebook as a virtual learning tool was null. In this document, there were no elements that indicate that the students who participated in the experiment changed his/her mind after completing the learning experience through Facebook. Only a few students commented that the experience was totally different from what they had in mind but still found elements that endorsed the idea of using Facebook academically.

Expectation about the potentiality of academic intrinsic elements by Facebook as virtual learning platform as well as the potential of avoiding instrumentation steps at the time of using Facebook as virtual learning tool are the great assets offered by this tool. From now, the recommendation for Facebook to be implemented in an alike mode as we advise at this experiment is truly endorsed.

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