

# Educational Platform for Sexuality, for the Project “Red Sentir... Con-ciencia juvenil”

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**Abstract**—Within the national development plan 2014-2018 of Colombia considered education as a fundamental pillar, where the same plan served as a mechanism that would allow social equality and thus levelling the possibilities of all Colombians. Taking this into account, and considering the accelerated increase in the use of information technologies and the communication, along with the possibility of providing more coverage in education, such as “La Corporación de estudiantes universitarios y profesionales de Marinilla (CORUM)” development and implemented a project called “Red Sentir ... Con-ciencia Juvenil” focused on the prevention of adolescent pregnancy, strengthening of the life plan, critical thinking, autonomy and making conscious decisions. The project derives in three fundamental components that constitute a process of integral formation with young people between 10 and 19 to us from the eastern Antioquia, that allows them to interact and relate with parents, teachers and institutional agents. The components mentioned are: (i) formation and socialization, (ii) regional bureau, and (iii) a digital platform. In this article, emphasis is placed on the strategies and developments made by the digital component in the creation of a virtual environment that allows linking experts, teachers, youth, parents and health institutions. For the development, a social network was created through different technologies, which involve web development, creation of relational database, server configuration and development of video game. All this possible through different languages of programming such as, python, HTML, JavaScript, that configure applications from both the client side and the applications from the server side.

**Index Terms**—Education platform, sexual education, teenage pregnancy, family planning health service, young friendly health service, sexual health services and reproductive, sexual education.

## I. INTRODUCTION

In Colombia, fertility in adolescence became in a public health problem, when from 1990 (for adolescents between 15 and 19 years old) measures of 12,8%, presenting in the later years a tendency systematically increasing that finds the maximum value in 2005 (20,5%). For the year 2010 (19,5%) a trend was achieved-decreasing that continues to be presented in 2015 with a measure of 17,4%. It is expected that by the year 2021 according to the adjustment made to the Ten-Year Public Health Plan 2012-2021 we reach the reduction of that percentage to a 15% [1]. By such a reason, Colombia was

raised in the development objectives of the Millennium (ODM) have cups of teen pregnancy by below 15%, however, the percentages reached were very far from those figures, which makes it necessary to redouble the efforts to reduce pregnancy in adolescents. In 2013, Colombia registered 6,423 births in women among 10 and 14 years and almost 150 thousand in women between 15 and 19 years, a figure that is high if you consider that together they represent 23,5 % of all birth [2].

Efforts to reduce adolescent pregnancy have been most significant in the most socially advantaged groups, in opposition to the less favoured, causing expand socio-economic gaps. This reflects the need to make greater efforts of the policy of prevention of teenage pregnancy in lesser groups favoured socially and where the greatest prevalence of adolescent pregnancy [1], [3]: rural areas, less educated, situations of poverty.

The differences caused by socioeconomic situations and geographical location, show that actions must be taken or generate inclusion strategies social [4], in which the topics of education are addressed sex in a cross-cutting manner with a rights-based approach and with greater coverage, to allow for the reduction of the existing gaps confirmed in the national plan of 2014-2018 development, and the principle of "do not leave anyone behind." enshrined in the 2030 Agenda, which includes the Objectives of Sustainable Development (ODS).

The problem of teenage pregnancy in Colombia shows that only 9 % of women and 5 % of young men consult health services because of mistrust and ignorance of this system. Despite that teenagers are aware of the methods contraceptives, only a small portion are used, according to figures published in [3], for the age range between 15-19 years, in women it is around 30 % and in 47 % men. The use of contraceptive methods not only it is important to control the birth rates of the country but also to prevent transmission infections sexual, in this sense, the use of the condom in Colombia is one of the safest practices to prevent diseases of 'sexual transmission (85,1 % in men and 84,4 % in women).

When the problem is approached from an approach of rights and to respond to information needs and formation in sexuality issues, it is necessary to raise education in a holistic way, in which they are strengthen and promote empowerment and develop skills in young people from a critical perspective that allows them make decisions that make it possible to protect and guarantee their sexual and reproductive rights. The exer-

cise of sexuality it is a human quality, whose effective construction requires intentional, structured processes or strategies and systematics that facilitates information and formation on issues related to sexuality analysed in the different geographic and socio-economic environments beyond the lived at school.

In Colombia, the right to sexual education is part of integral to both the 1991 Political Constitution and the various policies that develop the agreements, pacts, conferences, ratified international conventions and conventions for the state. The role of the education sector in the promotion and guarantee of Sexual rights and rights Reproductive diseases stand out from Resolution 3353 of 1993. Therefore, the obligatory nature of sexual education in educational institutions is ratified in the National Plan of Sexual Education (MEN, 1994) and the General Law of Education (Law 115 of 1994 and Regulatory Decree 1860). Other normative references are the CONPES Social document 147, where the guidelines for prevention are defined of pregnancy in adolescence, the PDSP 2012-2021 (MSPS,2014), in which it is established that sexuality is one of the prioritized dimensions, that is, consider this aspect as fundamental to achieve health and well-being of all individual, without distinction by sex, gender, ethnicity, life cycle, socioeconomic level or any other differential aspect [3],the adolescent has the right to protection and training integral.

Responding to the needs described above, was created the Red Sentir ... Con-Ciencia Juvenil". The "Red Sentir...Con-Ciencia Juvenil" project, aims to implement strategies to prevent teen pregnancy focusing in strengthening the life plans of young people,linking digital tools in 6 municipalities from Eastern Antioquia - Sonson, Abejorral, San Francisco,Marinilla, San Luis and Algeria-, this through the development of a virtual educational and recreational platform, what includes components for social networks, mobile devices and video games, where it focuses on sexual education and the strengthening of the projects that make up the plans of life of young people.

The project works with 3 components that are: (i) Digital Platform, (ii) Formation and Socialization and (iii) Regional Bureau.These components allow strategies to be activated pedagogics from technology, memory and research, with which a pedagogical addressing is achieved that produces comprehensive, holistic and meaningful educational processes. The Formation and socialization components and that of Regional bureau are linked to the component digital through the strategy of realization of the digital platform, in said platform is documented and the contents addressed within the courses are reflected made, as well as reviews on the encounters of the different municipalities. On the part of the Regional Bureau it is related through the visualization of each one commitments of the municipalities with the processes of the "Red Sentir".

The strategy of the Sentir Network was based on working on the determinants of teenage pregnancy, with which changes can be achieved in the initial situation and reach reductions in teen pregnancy rates in the region from eastern Antioquia. This is because it includes a methodology where the activities that are carried out promote interaction with young people and their environments, which configures a determining factor in favouring a relationship of trust and quality with the young

person by a trainer who can act at the motivational level and in turn serve as a reference and/or model. This provides a peaceful environment for young people, where they take ownership of the topics discussed and allow them interact safely to address important aspects in order to encourage assertive behavioural changes.

The construction of the digital platform of the "Red Sentir", responds to the progress and constant evolution derived from transformations caused by electronic civilization and the scientific-technological revolution of the education system. Is as well as the digital platform is part of the so-called "society of knowledge", characterized by the implantation widespread use of new information and communication technologies communication (ICT) that will govern the future of the systems economic, cultural innovation, human interactions and obviously the processes and circumstances of learning and education [5].

Despite the need to implement ICT by expanding its access and appropriation, it is indisputable that there are abysmal inequalities in terms of the possibility of access to same in Latin America, which make up a gap digital in two dimensions: On the other hand, the international gap existing where there is a Latin American backwardness regarding the progress of ICT in the most developed countries and on the other, the inequalities within the same countries Latin American countries usually related to the level of income, the quality of life and family cycles [6], decrease this gap requires a relevant integration of ICT's with education as well as the use, update, and interpenetration of specific sociocultural contexts.

In Colombia, according to what is established in [7], wanted promote the use, understanding, appropriation and interaction of ICTs, thus seeking to generate guarantees for society to access different services, doing in this way that the people of the country can be an active part of society of knowledge. Giving preponderance to the use of ICT and linking this with educational issues, it will be possible to reduce the socio-economic gaps and give young people opportunities for an integral development with quality of life.

The main features of the platform "Red Sentir", that makes it different from other websites or platforms virtual identities (such as those of the protection ministry) and health of the Colombian government [8], that of the secretary of health of Bogota in alliance with the Foundation Santa Fe de Bogota and Profamilia [9], or the Frequent Questions about health [10]) are: (i) pleasantly generated content for adolescents and young people, (ii) active participation interaction among youth, (iii) video games for the compression of sexuality, (iv) discretion of the environment to encourage the participation of young people by offering the possibility of participating anonymously, and (v) the deployment of different interfaces according to the interests of each public (young or adult).

## II. OBJECT

The "Red Sentir" Digital Platform is designed to attract young people through videos, animations and two video games, which can be accessed from the web and mobile devices. It also has a module that allows the publication of content

related to the topic and one module of virtual forums on topics concerning sexual health and life project, where it is possible for adolescents, teachers, parents and experts to interact. It also makes it possible for the municipal and departmental health and education secretariats to articulate and use it as a means of disseminating their sexual and reproductive health programmes, offering them the possibility of using the didactic guides for the training of parents and teachers. The platform was designed in the Creative Commons format, which has allowed developers to easily link to the platform.

The “Red Sentir” project, linked the users through the exchange of concepts and experiences learned within the courses and allows to continue with the process of learning and empowerment of the themes of sexuality, life plan, dreams and recognition of the body as first territory (Other works such as [11] impact shows a study about the impact of teenage pregnancy on the future life and the social, family and educational changes). To take this to different modules have been programmed that allow a constant interaction between the different modules you can find a different display depending on the age of the registered user.

In the case that the user be a young person, has the following modules: (i) a Timeline, (ii) young friendly health services, (iii) frequent questions, (iv) forums, and finally (v) two video games, all this in order to encourage and facilitate access to information in a dynamic, reliable and confidential way (digital technologies and social networks in general play an important role for the socialization and interaction of teenagers, which is reflected in their privacy, constituting in many cases unsafe environments [12], [13]). If the registered user is older, the display of the platform is different, it has some modules in common and other exclusive, among the modules in common are: (i) forums, (ii) video games, and in a differentiated the modules: (i) training, (ii) regional bureau, and (iii) baseline.

For the evaluation of the modules that make up the digital platform, several aspects are taken into account determine the quality of software, as is the evaluation of the development process through which it has been developed the system and on the other hand the evaluation of the quality of the product itself, it is said that a software is quality when executes the functions for which it was created with optimal performance.

The digital platform of the red sentir requires a high level of quality and safety since this is intended contain personal information of thousands of users, to have welcome and generate trust in users with respect to response times and data confidentiality.

### III. METHODS, TOOLS AND TECHNOLOGIES

#### III-A. Didactic methodology

The methodology of the Red Sentir is designed and developed taking into account the variety of contexts that present the six municipalities in which they are carried out, including the Urban areas, villages and hamlets. To achieve it, the Red Sentir developments three general components:(i) A regional bureau, (ii) an educational component and socialization, and (iii) the digital platform, each component was in charge of a particular area: the regional bureau was responsible for

creating articulation between the institutions involved, the educational component was in charge of the courses for the youngers and teachers, in addition to the creation of a meeting between parents, teachers and young people in the local and regional, and finally, the digital platform created as an articulating component and facilitator of the interaction between teenagers, teachers, parents of family, hospitals and schools.

Regarding the educational component, the methodology of implementation of the pedagogical model was based on the Participatory Action Research [14] as a method and founding epistemic-practical guiding of field work and the systematization of experiences carried out. Added to this method was implemented, as a paradigm of the world, sociocritical thinking [15] and the rights approach [16], approaching a comprehensive approach to sexuality issues that allowed in turn to improve the capacity of young people to the decision making.

Under the previous precepts the project impact directly a population of 673 young people, 100 teachers and 2250 people in the events of local and regional meetings made, the ages of the young people were between 10 and 19 years, most of them were in school (the half of the youth were men and the other half were women), distributed in the 6 municipalities as follows: the distribution of the users benefited from the courses correspond in 39 % of the youth to the area rural and 61 % urban areas. Additionally 60 of these young people received a complementary training in leadership, with the aim of strengthening the boost of the Red Sentir in the different municipalities and revitalize the corresponding elements to the digital platform, the young people transmitted their suggestions to the facilitators in terms of design, functionality and other aspects of the digital component of the Red Sentir.

To link to hospitals, municipal administrations and directives from schools to the digital platform were made meetings with representatives of each one in the municipalities that were in charge of the Regional bureau, there was collected important information about the usefulness that should have the Red Sentir in its digital component in such a way that could articulate the work done by each institution in an isolated way. With the information collected in these scenarios, as well as the needs that the team raised of the Red Sentir, the requirements of the design that the digital platform should have. At first, the equipment made a base on which it was built in an incremental and iterative way the different modules that make up the digital platform. The most important aspects in the methodology of development of the digital platform were the following:

- **Participative character:** It was designed with the suggestions and needs that were raised from each of the actors and areas of the Red Sentir.
- **Developed by modules:** It was carried out on a structure of design by modules in order to develop each one separately and meeting to the needs that they were posed.
- **Iterative and incremental:** for each of the modules is received the feedback from the team and the users with the objective of improving little by little the design made.

- Open software and Creative Commons: The project Red Sentir seeks to solve a social problematic, it is considered the use of open software as a fundamental element since it can be easily replicated and improved by others.

### *III-B. Digital platform*

Taking into account the Creative Commons format for which the platform was designed, and based on the concept of open Software, Python was selected for its Open Source feature, as it is a programming language dynamic and object-oriented, for its integration with other languages and tools, and also for being multi-paradigm and multi platform.

Currently, any web application is the sum of different programming languages and label languages. This is mainly because the web is no longer it is just a set of HTML pages (HyperText Markup Language), but have also been developed different technologies that have allowed dynamic pages and complex applications. This complexity makes it precise a careful design and application logic in server or client that allows the user to perform the relevant tasks.

### *III-C. Web server*

The design is based on the execution of the corresponding programs about a central server HPE Proliant DL120Gen9 [17] located in the facilities of CORUM. For the configuration of the server, is installed the version of ubuntu server 16.04.03 LTS Xenial based on a system linux operative. Server programming was carried out by means of the cherrypy framework explained in sub-section III-D2.

**Client side applications (client-side):** Here comes in at starting the JavaScript and HTML language. The server provides the code and the client (through the browser) the execute.

**Applications on the server side (server):** The server executed the application; this, once executed, generates certain HTML code; the server takes this code recently created and sent to the client through the HTTP protocol. For server-side applications, the language used it was Python.

The languages used to fulfill this task were HTML, Python (Server-side), Postgresql and Javascript (Client-side). The libraries used (all with GNU license) were jQuery, Bootstrap, among others.

### *III-D. Programming*

The programming of the different modules that make up the digital platform of Red Sentir uses the pattern of software architecture Model-View-Controller (MVC), using for this the design of programming in orientation objects, with which the principle of "Do not Repeat Yourself" is used or DRY, and in turn provide better synchronization. Even though the technology used in this development modifies it a bit and leads to a Model-View-Template (MVT) pattern in django. The programming pattern in MVT is similar to the MVC, but in this case, the view describes what data has been published, so it does not configure a view in itself, but rather it is a controller that is called the view, in the case of the template it corresponds to the views of the MVC, i.e., the way in which

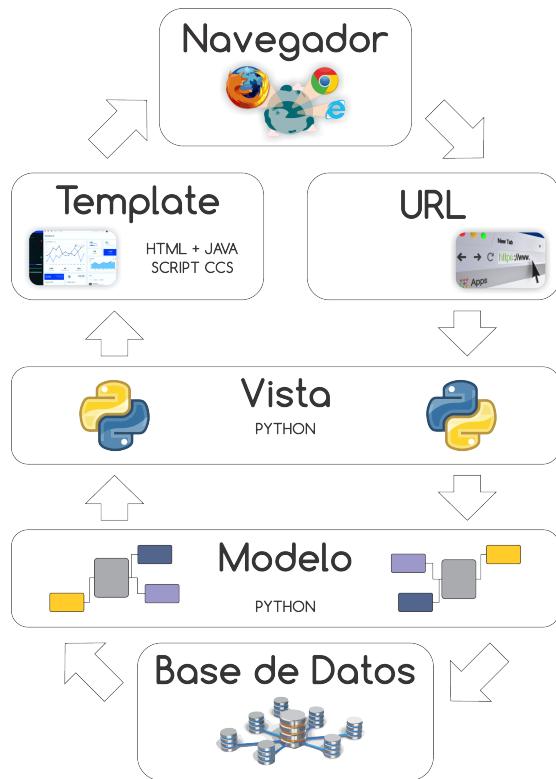


Figura 1: Internal schema of MVT used by Django.

are the data, so the forms go in template, these forms make requests to the views, and to turn the views data of the mod purpose.

#### *III-D1. Framework Django*

Django is a framework for web development of code open based 100 % on the Python programming language (django is written as a collection of Python libraries) which uses the programming pattern in MVT [18], [19]. The figure 1 shows the internal schema used by the framework Django.

The main objective of Django is to facilitate the creation of websites where you can develop a software tailored to the requirements of customers. The main advantages of Django, is the emphasis it makes in the re-use, connectivity and extensibility of components, in addition to the possibility of obtaining rapid and structured as a consequence of using the **DRY** principle. Throughout the development carried out with the framework django, the Python programming language is used, for server settings, files and models of data [20]. Django also allows to work with a panel of administration to enable those responsible for maintaining the website a constant feed of content.

**III-D1a. Administration Panel:** In the websites, an administration interface is an essential part of the infrastructure. In Django you have the possibility of using your administrator panel for the website, which it is a web-based interface, limited to the manage the site, which allows you to add, edit and delete the content of the site, controlling the content that is going to publish, the information that will be stored in the base of the data of registered users or participations that are made within the page in order to serve as content moderators

that are generated by users. Django's approach, then, is the construction of an automatic management interface that allows manage website content in a manner immediate.

*III-D1b. Objective-Relational Mapper (ORM):* In Django the ORM is the one that allows to interact constantly with the base of data, it is the Django framework that is responsible for operations on objects in SQL statements, which they are going to run on the tables in the database. This allows the programmer more flexibility, by not having to focus on these actions, but Django will detect that the programmer is modifying or adding a piece of information and it will let the database know.

### *III-D2. CherryPy Framework*

CherryPy is a web framework with object-oriented programming designed to allow the construction of web applications in the same way that any other is built another Python object-oriented program, so it leads to a smaller source code you have developed in less time.

CherryPy can be a web server on the same day or you can launch a crossing of any environment compatible with WSGI (Web server gateway interface). It does not deal with tasks like the creation of templates for the output rendering or the access to the back-end. The frame is extensible with filters, the which are called at defined points in the processing of requests/answers [21].

The main characteristics of CherryPy are:

- Web server compatible with WSGI with HTTP / 1.1.
- Multiple HTTP servers (ability to listen to several ports).
- Support for any other web server or adapter enabled for WSGI, including Apache, IIS, lighttpd, mod python, FastCGI, SCGI and mod wsgi.
- Built-in tools to encode and authenticate.
- It is a flexible system.
- CherryPy tools relate events within the application process. Each time the server CherryPy receives a request, there is a specific set of steps to follow to handle that request.

### *III-E. Database*

In general, the development of a web application is you need to work in a database backend, is precisely the database that makes up a part fundamental of any application. The information obtained from registered users (in the case of the Red Sentir platform), of the information generated throughout the project in which they are involved all formation processes or that may result from interest or need to take statistical or to be informed later for some task determined by part of the digital component. Therefore, the general purpose of database is the manage information in a clear, coherent and orderly manner a set of data that will subsequently become relevant information to determine the positioning of the project or geographic location of registered users and the way in which they can be linked with institutional bodies municipal.

Django's book [19] recommends the use of postgres when reaching a balance between stability, reliability and stability. In the same way, the frame is compatible with numerous types of databases. To work with the data that is handled in

the platform, makes a mean of relational databases through postgres.

#### *III-E1. Postgres*

PostgreSQL is a powerful open source tool that uses and amplifies the SQL language combined with many functions that safely store and scale charges of more complicated data work. It is in an object-relational database management system based in the POSTGRES project of the University of Berkeley with more than 30 years of development [22]. Postgres offers reliability, data integrity, robustness, expandability and portability, in addition to having the advantage of the work that can develop the people that make up the community of open source and the possibility of providing solutions adaptable and high performance that mar compatible with the platform.

Some of the main characteristics are those of Postgres are:

- Integrates and supports different types of data.
- Presents concurrency in the tables that have been joined better performance.
- Allows the administration of several users.
- It is possible to use inheritance between tables, with which database manager is included among the managers object-relational.
- Allows the use of the open source tool pgAdmin for the administration of the Postgresql database a crossing of a graphical administrative interface [23].

To use Postgres it is necessary to install the packages psycopg or psycopg2.

### *III-F. Video Educational Game*

It was considered the realization of a video game thanks to the technological advances and the increasing demands of devices virtual to access information or have fun. An important feature has been the constant reduction of prices in technological devices, such as subsidies and the support that the inclusion policies of the different countries have made to expand more and more the use and access from them to the less favored populations (in the case of Colombia with the development plan 2014-2018). In this scenario digital strategies and video games play an important role since they can combine a meaningful learning with fun.

For the programming of video games, it is necessary to have account different aspects: (*i*) the realization of illustrations the publications and animations that make up the graphic part of the play and provide authenticity to it, (*ii*) the ability computing of the devices on which the video game execute, (*iii*) technical knowledge within the team of work, (*iv*) the established times, and (*v*) the public to whom the game is directed. At this point it is also important to talk about tools, programs or environments of integrated development (IDE) you need to make the video game, such as: TexturePacker, Cocos creator, Dragon Bones, Clip Studio Paint, toon boom, among others.

#### *III-F1. Cocos Creator*

Cocos Creator is a package of development tools of free and multiplatform video games that includes a motor based on cocos2d-x. Cocos makes it possible to organize the flow of work, resource management, scene editing through of

canvases, preview of the game in development, depuration, inclusion of sounds, effects and animations, and construction for the publication of the project in different devices. Cocos offers the possibility to work with JavaScript and how to create game sequences through commands using **visual code** text editor, which supports debugging, syntax highlighting and auto completion of code lines, use with this that you can refine and organize the programming structure of the game. All this set of tools provided by Cocos is then a way innovative of the organization of programming through the graphical user interface and its animation editor, facilitating more understandable programming [24].

### III-F2. illustrations

In the development of any visual piece or this case of video game is determinant the images or illustrations that they compose it, both the personages, the objects, as well as the different sceneries that involved in it. Within this project is used for different design programs that made possible the realization of them, such as: Clip Studio Paint, toon boom, among others.

**III-F2a. Clip Studio Paint:** They are a set of applications of graphics software for different operating systems, developed by celsys. It is mainly used for digital creation of comics, manga, cartoons, illustrations and 2D animation [25].

**III-F2b. Toon boom:** Toon Boom Animation Inc. is a enterprise specialized in the production of animation, flashing Toon Boom Animation Pro, which serves for the creation of illustrations and professional animations of a wide variety of tools [26].

## IV. DEVELOPMENTS AND RESULTS

The main result of the digital platform was its the ability to link both actors and components involved in the project, as well as their capacity to generate trust in young people and in this way allow them talk about sexuality issues and life plan so secure. In the Figure 2 shows a diagram of the structure of relationship of the three components of the Red Sentir and its interconnection with young people, parents and actors institutions (hospitals, schools and town halls).

For the creation of the Red Sentir digital platform it was necessary to carry out a series of steps that would allow to go structuring and at the same time to give the required functionality to the platform; in the following descriptions it is provides in greater detail the steps taken:

### (i) Development of the base structure of the platform

**of the Red Sentir:** Based on the design pattern MVC is created the base structure of the documents of the platform, on this basis a template folder is defined (created), that contains another folder named “sitio” where they are located separate way sub-folders that contain templates or models for each of the modules that are part of the project. Within the templates folder is included, in the root of the directory, the base.html document that constitutes the support of the presentation of the platform. It is defined in addition the static directory where all the documents are located of the platform, i.e., the images, audiovisual contents, style files .css, the code to be executed on the client’s side i.e. the documents.js javascript and the

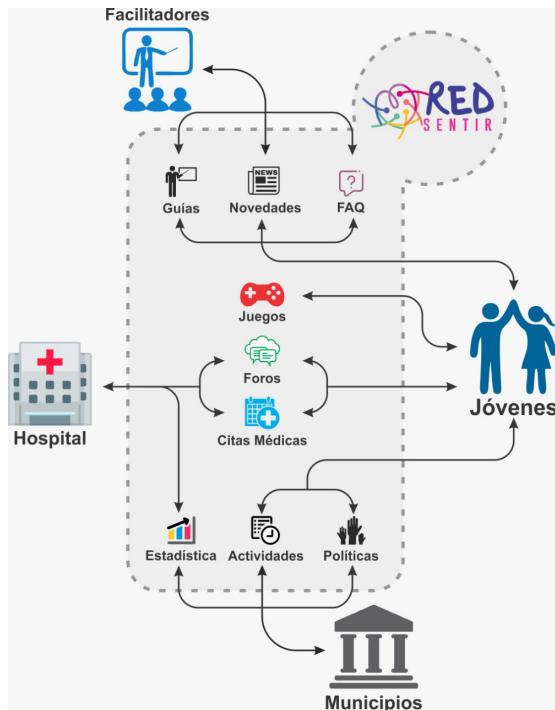


Figura 2: Structure of the Red sentir.

constructions of the available games inside the platform. A directory was also created (or application) for each module with the respective controllers and models, as well as a directory (or project) called a “red sentir” to contain the configuration documents and system urls. A security module that contains the controllers and user models and user profile in addition to the methods for creating and editing users.

**(ii) Settings.py:** The document setting.py correspond to all the configuration of the “Red Sentir” platform, in it the database configured in Postgresql is related, it is configured the root route, the static route, the communication mail it is configured, the different applications are added and the login is redirected directly to the timeline. The document is on the route: redsentir/server.py.

**(iii) Creation of the relational tables with the database through Postgresql:** The platform of the “red sentir” uses relational databases where each of the relationships must be created through the Structured Query Language (SQL), in order to go linking the different users and contents of the platform.

**(iv) creation of registration form:** It is created in html language and a ccs registration form through which the users that enter the platform can fill all the corresponding information for the creation of their profile, the basic data to carry out this, are. (i) the username, (ii) the date of birth, (iii) the password, (iv) the email, (v) the phone number, (vi) the sex, and (vii) the avatar choice. All these data will identify you within the system. The birth date is of special importance, because through this information a separation and consultation process it is carry out in this database for the differentiated visualization within the digital platform “Red sentir”, showing two possible views 4, one for registered users under the age

of 19 4a and other for the older ones 4b.

(v) **Creation of authentication form:** It is created in html language and a ccs an authentication form through which the users who enter the platform identify themselves with their corresponding user and password.

(vi) **Creation of a user profile model:** since the platform design follows the MVC, it is necessary to implement the user profile model with the corresponding fields where the data type and the default values are also defined.

(vii) **Administrator of Django:** The administrator allows controlling the other modules of the system such as the security module, which is where the users of the platform are registered, as well as the groups of permits that are registered, assign these users. The administrative module is developed at the same time as the other modules, because it facilitates the creation of test entities through the methods that allow creating, removing, editing and listening the instances of objects in each case, it has an authentication and authorization menu for the creation of users and groups. Within the module it is also possible to administer what is added in several of the existing modules, thus allowing to control in a simple way the content that is published. The modules that can be modified from the administrator, either to upload, delete or edit, are: (i) frequent questions with their respective answers (ii) training through the ability to add and edit the meetings, (iii) forums, (iv) regional bureau plans, (v) security, (vi) users and groups, and (vii) young friendly health services. In the figure 5 shows a brief view of the administrator module of the “Red sentir”.

It is through the configuration of these steps that the visible modules within the platform and their functionality can be built.

#### *IV-A. Platform modules*

(i) **Novelty:** A new module was created that works as a timeline where young people can participate through multiple tools: text, audio, image or video. One of the added values of this module is that it is only available to young people, so the interaction occurs directly between them, allows them and gives them greater confidence to express their opinions and express themselves. Figure 6 shows the view of the module.

(ii) **Young friendly health services:** A module of young friendly health services was created, this module consists of a tool that enables and approaches teenagers with municipal health centers and professional aids in matters of promotion and prevention, this module is considered a mechanism of technological transfer to hospitals, since it allows to improve the access to health services and the opportunity for care, as well as the possibility for young people to perform supervision and control of these services through the qualification they give to the services they access. Figure 7 shows the view of the module.

(iii) **Frequently questions:** The frequently questions module was created so that teens can easily find the answers to common questions, many of them are identified from the line of support of the formation processes that have allowed, the construction of the content of this module, hence the importance as it provides an answer to contextual needs, these

questions are prioritized according to the number of times they are consulted by the young people in different spaces. Figure 8 shows the view of the module.

(iv) **Forums:** The forum module was created so that the users of the platform can interact and ask directly experts from the health or psychology area who can solve the questions they do not find within the module or frequently asked questions (otherwise the young people would have limited access to this type of information). To make the young people feel confident when they participate in the forums, the anonymous button is implemented, which allows participating in the forums and the user name does not appear in the comments of the forum, figure 9 shows the view of the forum module.

(v) **Videogames:** Taking into account the different digital strategies oriented to education, as it was stated in III-F, within the “Red sentir” the creation of a videogame that would link the subject of sexuality was planned, and that at the same time it allows them to learn by having fun. Two videogames were programmed to deal with and address these issues from two different approaches, the first one is based on the type of game “endless runner”, the game is called “Preventor” and the idea is to prevent the sperm that are appearing from touching the ovum which is manipulated by the player, the game ends when the measure of energy reaches 0. The second is based on “castle defense”, and is called “Dawn of Zoides”, in which the dynamics of the game it consists of preventing the sperm from reaching the castle. The Figure 10 shows the views of the two games available within the “Red sentir” project.

(vi) **Formation:** It was created a formation module in which is related the material and the methodology used in the courses, so teachers can reply the strategies to aboard the sexuality topic with the students since they have at their disposition the guides made by the training component. In addition, the module shows the reviews of the meetings held in which intergenerational dialogues were given, the formation module can be seen in figure 11.

(vii) **Regional Bureau:** This regional bureau module makes a relationship of all the commitments that were reached with the participant institution in the local and regional bureau in the municipalities that are part of the “red sentir”. The importance of the regional bureau within the “red sentir” lies basically in the fact that a project like this makes sense as long as various actors involved get to know and support each other from the possibilities of each one, recognizing this space of the platform and making participants of the same, either through the implementation of strategies, an event dissemination space or a complement to the local strategies themselves, an example of the visualization is shown in figure 12.

(viii) **Lineabase:** Within the lineabase module the results of the diagnosis are displayed, socio-demographic aspects, social activities, personal relationships, sexual health, life plan, subgroup analysis and adolescent pregnancy within the regions that understand the project. The way in which the module is presented is shown in figure 13.

Finally all the modules are linked, thus forming the digital platform, in figure 3 a relational scheme of the network is shown.

The base structure of the project of the digital platform of

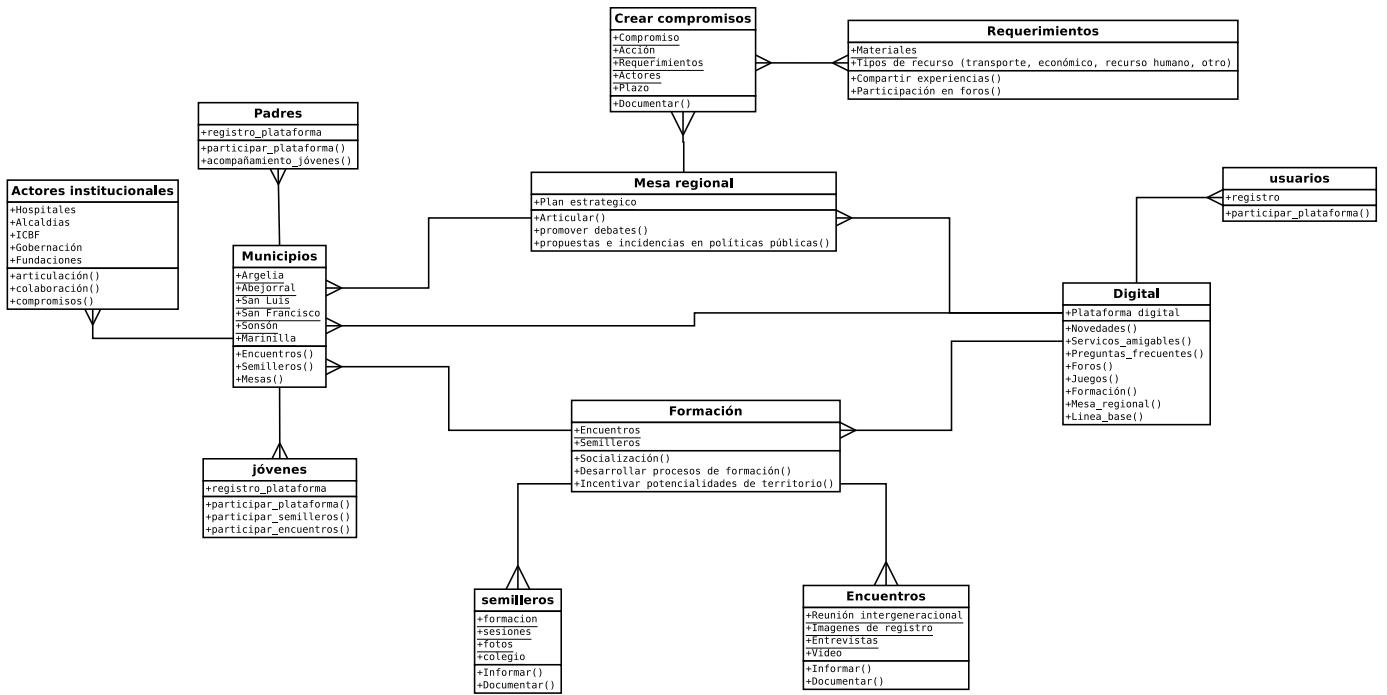


Figura 3: relationship diagram.

the “red sentir” according to the way Django organizes and arranges the directories is shown below.

```

redsentir/
    manage.py
    server.py
    redsentir/
        __init__.py
        settings.py
        urls.py
        wsgi.py
    faq/
    formacion/
    foro/
    lineabase/
    lineatiempo/
    mesa/
    seguridad/
    servicios/
    static/
    template/
    sitio/
    base.html
  
```

Each one of the folders in which the project is divided correspond to applications, which contain the following files:

```

faq/
    __init__.py
    admin.py
    apps.py
    migrations/
    __init__.py
    models.py
    test.py
    urls.py
    views.py
  
```

Dentro de los resultados obtenidos en el desarrollo del proyecto, y que se pueden visualizar en la plataforma digital se encuentran: (i) una plataforma realizada a la medida en funcionamiento, (ii) dos videojuegos en la plataforma, (iii) materiales pedagógicos con acceso virtual, (iv) 30 foros virtuales para la participación de los adolescentes, (iv) información del proyecto en la plataforma, (v) manifestación de los compromisos de las alcaldías municipales, (vi) vinculación de las instituciones prestadoras de servicios de los municipios, y (vii) constante acompañamiento y solución de inquietudes a los jóvenes a través de la plataforma digital.

La plataforma digital de la Red Sentir logró vincular en sus primeros seis meses de funcionamiento un total de 2511 usuarios (52 % hombres, 44 % mujeres y un 4 % no seleccionó).

Para observar la aplicación web desarrollada por el componente digital de la Red Sentir, es necesario ingresar en el navegador [www.redsentir.org](http://www.redsentir.org), allí se puede observar los diferentes resultados expuestos en el presente artículo.

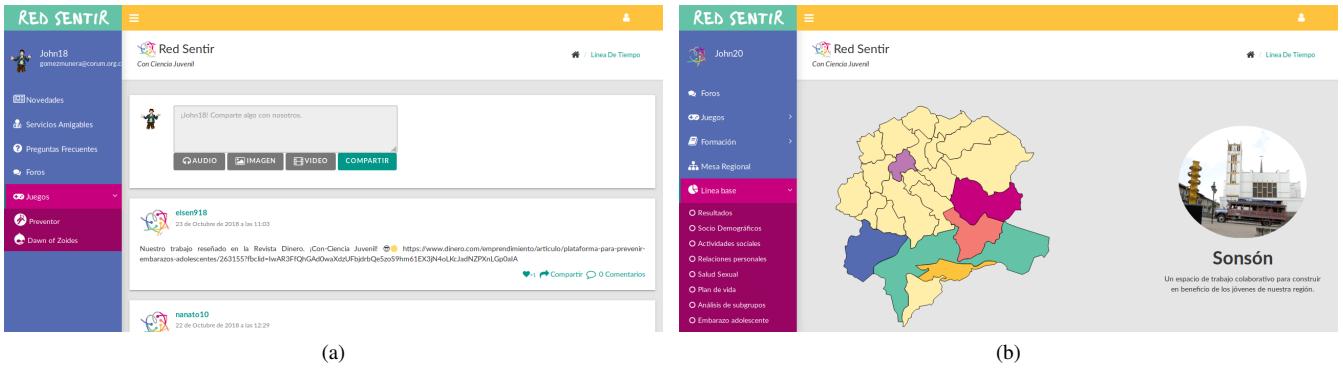


Figura 4: Vista de la plataforma digital según la edad del usuario. (a) Menor de 19 años, (b) mayor de 19 años.

Figura 5: Módulo de administración de la Red Sentir.

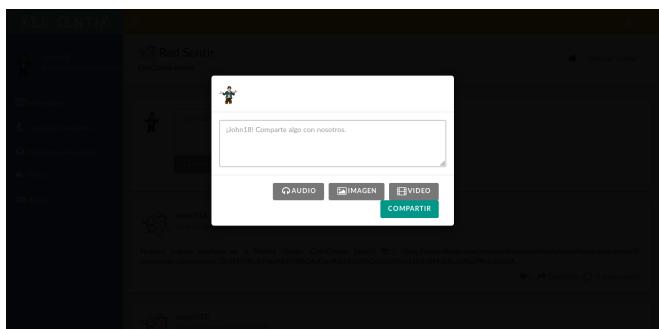


Figura 6: Línea de tiempo de la plataforma Red Sentir.

Figura 7: Módulo de Servicios Amigables.

Figura 8: Módulo de Preguntas Frecuentes.

Figura 9: Módulo de foros de la Red Sentir.

## V. CONCLUSIONES Y PERSPECTIVAS

La Red Sentir se ha constituido en una estrategia novedosa para el abordaje del fenómeno del embarazo adolescente, fenómeno resultante de diversas problemáticas y caracterizado como un fenómeno de alta complejidad (UNESCO). Responder a esta complejidad requiere de la articulación de acciones de diferentes instituciones de tal forma que se puedan crear impactos sociales favorables, es así como la plataforma digital de la red sentir respondió a estas necesidades y creó herramientas digitales para facilitar las interacciones complejas entre gobiernos, colegios, jóvenes, profesores, instituciones de salud y el equipo de la Red Sentir.

La Red Sentir se encuentra alineada con la búsqueda de los gobiernos nacionales por generar una mayor inclusión comunitaria y reducir los factores de riesgos en los que



Figura 10: Juegos disponibles en la plataforma digital de la Red Sentir.

Figura 11: Módulo de formación disponible en la plataforma. (a) Guías de docentes, (b) encuentros locales.

Figura 12: Módulo Mesa Regional disponible en la plataforma.



Figura 13: Módulo de Línea base del proyecto.

están inmersos muchas de las personas (Sobre todo los más jóvenes), que terminan en muchos de los casos reflejado con consecuencias que pueden truncar el plan de vida de los jóvenes perpetuando los ciclos de pobreza en las comunidades.

De igual manera, no es solo la situación económica la que influye en los procesos educativos de los adolescentes, sino también los factores demográficos, sociales, culturales y uno de los más importantes el acceso a las TIC, ya que es a partir de ella que se pueden mejorar las condiciones de vida de las personas a través de estrategias digitales tales como la plataforma digital de la Red Sentir.

Con la investigación realizada por la Red Sentir acerca de los factores de riesgo asociados al fenómeno del embarazo adolescente se generó una estrategia de intervención haciendo énfasis en los planes de vida, los derechos humanos, el reconocimiento del territorio, el cuidado del cuerpo, el aprendizaje, el uso de métodos anticonceptivos y el fortalecimiento de los sueños.

La plataforma virtual complementó el proceso llevado a cabo por el componente de formación como una estrategia para vincular, reforzar y lograr un mayor alcance diferente al logrado con los adolescentes que participaron directamente de los semilleros, además la vinculación de los foros permiten aportar información idónea en contextos donde el experto no puede llegar de otra forma.

La implementación de la plataforma en los ámbitos sociales trabajados permitió generarles una mayor apropiación en las temáticas tratadas a través de herramientas y el uso de las TIC, en particular desde la plataforma digital del la Red Sentir, la cual también ha permitido el proceso de documentación y registro para que pueda ser replicado en diferentes contextos no solo nacionales sino también internacionales.

Desde lo técnico, el uso de los diferentes frameworks, permitieron la programación de una plataforma virtual cuyo objetivo es el de crear confianza en los más jóvenes (determinada por la separación de las vistas para jóvenes y para mayores, lo cual les permite sentirse en un entorno de pares), al funcionar como una red social orientada directamente a trabajar, hablar y formar sobre los temas de sexualidad, para que los jóvenes obtengan información que les ayude a experimentar, descubrir y vivir la sexualidad de una manera responsable. Con el desarrollo de la plataforma digital, se pudo incorporar y mezclar tecnologías junto con los respectivos lenguajes utilizados (Django, cherrypy, HTML,

CSS, JavaScript, Postgresql) que llevaron consecuentemente y en buen término a un resultado final reflejando las fortalezas y carácter interdisciplinario del equipo de la Red Sentir.

Tanto los productos como los resultados obtenidos por el proyecto, arrojan un análisis positivo y satisfactorio en todos los aspectos y desde los diferentes componentes. Esto indica en si, el asentamiento de una base para continuar interviniendo en las comunidades en las que este factor de riesgo es alto, dejando en si un trabajo que puede ser extendido, complementado y replicado para las demás comunidades en los que se considere pertinente implementar la estrategia. Dentro de las funcionalidades que puede tener la plataforma digital, las mismas pueden ampliarse e incorporar nuevas herramientas, ya que esta es una tarea de crecimiento continuo que debe adaptarse a nuevas tecnologías, siendo un proceso iterativo e incremental, aunque precisamente es eso lo que puede verse como una oportunidad, ya que dentro de lo digital, la necesidad de introducir nuevas mejoras y nuevos contenidos que complementen lo ya implementado es lo que permiten que se genere una confianza y un retorno a la plataforma, entre las funcionalidades identificadas para seguir trabajando dentro de la plataforma se plantean:

- Crear continuamente contenido para los jóvenes, padres y actores institucionales.
- Volverla una herramienta masiva, que sea implementada en las instituciones educativas dentro de un ámbito nacional, sirviendo de apoyo en la enseñanza de la sexualidad.
- Vincular a los educadores para generar trabajo colaborativo a través de la plataforma.
- Mejorar y actualizar los video juegos existentes dentro de la plataforma, incorporando para ello más personas preocupadas por un aprendizaje con diversión, esto tiene que ver con las nuevas estrategias de e-learning, desde las cuales se ha demostrado que cuanto más entretenido se encuentre el estudiante más información puede retener, lo que conlleva que el estudiante puede aprender más y a su vez generarles una apropiación de las TIC de manera eficiente dentro de los entornos educativos.
- Aumentar la dificultad de los juegos a medida que se va avanzando y consiguiendo puntos. Dicha dificultad puede verse reflejada en mayor velocidad, aparición de nuevos personajes, uso de diferentes herramientas, movimientos, inclusión de nuevas animaciones, inclusión de información educativa o nuevos gráficos.
- Disponer de una estrategia comercial para compra de elementos que ayuden al autocuidado y a la prevención del embarazo (Anticonceptivos), con el objetivo de ser ofertados a través de la plataforma y generar sostenibilidad financiera para la misma.
- Tener un registro de los puntajes obtenidos en los juegos dentro de la base de datos, lo que permitirá tener una mejor estadística de los usuarios y nivel de juego, para realizar tratamientos posteriores.

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