



FREE TRAINING MODEL FOR PUBLIC SCHOOL STUDENTS FROM DISADVANTAGED SECTORS OF GUAYAS PROVINCE IN ECUADOR

MODELO DE CAPACITACIONES GRATUITAS PARA ESTUDIANTES DE COLEGIOS PÚBLICOS DE SECTORES POCOS FAVORECIDOS DE LA PROVINCIA DEL GUAYAS EN ECUADOR

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Abstract

This study shows a model of free training for high school graduates and students of the last year of secondary from public institutes of some cities of Guayas Province in Ecuador. This is coming through a social project called “Desafío ENES” (ENES Challenge) which aims to prepare young people to take the national examination to be admitted in a public university; this test is very demanding and competitive because it is the starting point to open doors to the most prestigious campuses in the country. Although the competitiveness generates excellence, it also produces less favorable results for people who do not have the necessary knowledge. For that reason, a learning model has been implemented for the academic training of people who will take the test and they need reinforce the areas evaluated in the exam. The trainings were given by undergraduates, they are students from different engineering careers at ESPOL - Escuela Superior Politécnica del Litoral of Guayaquil and as volunteers of the project, they shared their knowledge and skills acquired during the development of their careers.

Keywords: Training, learning, skills

Resumen

Este estudio muestra un modelo de capacitación gratuita para los graduados de secundaria y estudiantes del último año de colegio de institutos públicos de algunos cantones de la Provincia del Guayas en Ecuador. Esto se viene dando a través de un proyecto social llamado “Desafío ENES” (ENES Challenge), que tiene como objetivo preparar a los jóvenes para tomar el examen nacional para ser admitidos en una universidad pública; esta prueba es muy exigente y competitiva, ya que es el punto de partida para abrir puertas a los campus más prestigiosos del país. Aunque la competitividad genera excelencia, también produce resultados menos favorables para las personas que no tienen los conocimientos necesarios. Por esa razón, un modelo de aprendizaje se ha implementado para la formación académica de las personas que tomarán la prueba y que necesitan reforzar las áreas evaluadas en el examen. Las capacitaciones estuvieron a cargo de los estudiantes de pregrado, son estudiantes de diferentes carreras de ingeniería en ESPOL - Escuela Superior Politécnica del Litoral de Guayaquil y como voluntarios del proyecto, compartieron sus conocimientos y habilidades adquiridas durante el desarrollo de sus carreras.

Palabras Claves. Capacitaciones, aprendizaje y habilidades.

Introduction

The project proposes the creation of a network of undergraduates where they can provide training to students who have completed their secondary education and having as a conviction the engineer mission that with other disciplines is to satisfy needs of the society.

The Ecuadorian National government through the National Institution of Higher Education, Science, and Technology - SENESCYT (for its acronym in Spanish) invites students twice a year to take the National Higher Education Examination for admission to the university. This test is the highlight of secondary school, the beginning of a free tertiary education and the guarantee of a good professional future.

It has been developed since March 2014, it has three editions implemented, and it has recruited a large number of volunteer students of different undergraduate careers and levels at ESPOL as volunteer trainers in different areas, which are considered in the test. In addition, it is a program that gives motivational talks and workshops to help participants to discover their potential and skills toward engineering. It has received support from different departments of ESPOL, especially Continuing Education Center - CEC where its director MSc. Julia Bravo has been one of the principal directors involved, and the nexus between students, teachers, coordinators and principals of different institutions at ESPOL.

Project context

The National Institution of Higher Education, Science, Technology and The Ministry of Education of Ecuador through an Interinstitutional agreement, they take a test called National Higher Education Examination - ENES (for its acronym in Spanish) as a prerequisite for those interested students in accessing to Public Higher Education.

The National Higher Education Examination (ENES) is an academic aptitude test that allows obtaining information on the skills possessed by students. Besides giving them the opportunity to pursue higher studies in public educational institutions, it is a test where the fields that are explored are verbal, numerical and abstract reasoning.

Problem Statement

Based on a thorough analysis of the current world that includes, among other things, the arduous demands of academic training of universities, the ability to raise sustainable solutions that solve present problems, the skill to cooperate efficiently in an environment of multidisciplinary work. These things have led the Ministry of Education of Ecuador to apply a competitive exam where young do their registration to take the test and get the minimum required score to apply for one of different offered careers and therefore they could access to higher education

It has seen how the results have been less successful in public schools, especially students from disadvantaged sectors of the city, because they are not sufficiently prepared to take the test and do not have the resources to enroll in a private academy for their training. The exam have a large number of candidates every year, and many students cannot get the required score or a high score. It allows them to obtain a place in a career they want; and sometimes those people decide to get a job immediately, instead to study or failing, they accept a place in a career they really do not like, which becomes them poorly motivated students to do their best for their university studies and future frustrated professionals. However, this could channel through receiving training to acquire the necessary knowledge and pass the ENES test.

Additionally, the project responds to the lack of interaction that engineer has in his academic development, the evident problems in their communities and they could contribute to solve them through their knowledge and skills.

Engineers with technical training should focus on sustainability issues and in the way that social problems impact nowadays. Once engineering students finish their studies, they become in developers of policies, therefore they should learn to think strategically about the social challenges.

Project Justification

The project aims to spark interest in Ecuadorian youths toward a career according to their skills and abilities. The ENES test is a determinant of competitive for the

school success and the advantages and disadvantages of an education system considered as a model of meritocracy to access a third-level education, but also a limiting factor for a big number of low-income students who cannot access a quality secondary education.

It has allowed forging volunteers as architects of the future impulsing to focus their ideas to creative solutions that solve tough problems to find only with common sense and they need the potential developed during their preparation as engineer. They should be aware of the challenges of their profession and be willing to reach out to other disciplines to develop and discover new skills, generating a benefit for their careers.

Methodology

The implementation and development of the project was given by a previous call of volunteers for the beginning of training. A meeting was held with students of different levels of engineering careers of ESPOL, The purpose is students can contribute to the project with their knowledge and skills.

They grouped and evaluated the most relevant activities later, and it was made the assignment of responsible for these activities. They were divided into group of volunteer trainers and volunteer coordinators, in order to cover the various areas covered by ENES examination. Volunteers have the opportunity to choose the area in which they feel safer and can collaborate. Then, when they feel strengthened, they start getting involved in the Project; they also can develop themselves in other area where they can become an excellent executor of it. Volunteer groups develop a schedule of all activities to do and a monitoring plan for the same.

Work teams were armed according to the availability of volunteers and their interests in an area. In addition, the project seeks the collaboration of volunteer teachers to guide the ideas that arise in students. Throughout the completely training program also includes activities that allow motivate participants, such as lectures, workshops engineering where it is intended that high school students can discover their potential.

CALL for trainers, logistics assistant and coordinator

The last edition of the project, there were a big demand of applicants that is why it was necessary to make a call for different roles, the principal idea was to form a teamwork for each academic areas and sites for the trainings.

For this call, volunteers were recruited by internet and they had to fill a form with their basic information, experience and their time available to help besides the academic area.

Figure 1. Registration for Volunteers

**REGISTRO VOLUNTARIOS PERIODO 2°
TERMINO 2015**

*Obligatorio

NOMBRES: *
Ingrese sus dos nombres en mayúscula

APELLIDOS: *
Ingrese sus dos apellidos en mayúscula

GENERO: *
 MASCULINO
 FEMENINO

CEDULA: *

No. MATRÍCULA ESPOL *

FECHA DE NACIMIENTO: *

EDAD: *

UNIVERSIDAD: *
(Tenemos voluntarios de otras universidades por favor escriba el nombre de la suya)

NOMBRE CARRERA: *
Ingrese el nombre de su carrera

Every volunteers of the project should fill the form of the Figure 1. The object is to have a database of all members.

The information requested on the form was the following:

- Name
- Last Name
- Gender
- Identification Number
- College Tuition
- Birthdate
- Age
- Career
- Number of Semester
- Email ID
- Mobile Number
- Skype
- Experience
- Academic Areas to collaborate
- Role they want to help (Teacher, assistant)
- Schedule
- Hours a week

Creation of teamwork

The volunteers were divided in three different groups:

- Educational Content
- Logistic
- Academic Trainers
- Coordinators

Educational Content was in charge to the structure of the classes and the brochure of exercises. Logistic was created to help the trainers during the classes, they do not give classes but they care of order before, during and after classes. Coordinators appeared in the last edition because the sites of trainings started to grow up. There were five different places where volunteers gave classes. This group was charge to give the reports every weeks.

The intentions of those team works is to cover the demand of many applicants of some cities of the cost of Ecuador as the TABLE I shows.

Table 1. Sites of Trainings

Sites	Number of Students
Daule	163
Guayaquil – ESPOL	285
Guayaquil – Estatal University	35
Naranjal	120
Palestina	60

Scheduling Class schedule

According to the different schedules sent by undergraduates, they majority were available on weekends that is why in almost of the sites, classes were taken on Saturday and Sundays.

The only site where there were classes during week was at ESPOL in Guayaquil because the demand was big and they separated the group of applicants in two.

- Students of secondary
- Graduates

Graduates received classes four times a week and students of Secondary on weekends (Fridays and Saturdays)

General Activities

Scheduling activities and monitoring the compliance of the time deadlines

- a. Dissemination of the Project made through the following activities
 - Publications on social networks of ESPOL
 - Visits to public schools nearby at ESPOL
- b. Application Form, the registration made by online form, which collected general information about applicants.

Figure 2 Application Form

Inscripciones para "DESAFÍO ENES" 2015 - 3era. Edición

La Escuela Superior Politécnica del Litoral (ESPOL), junto con el Centro de Educación Continua (CEC), presenta DESAFÍO ENES, el cual es un curso de capacitación para el EXAMEN NACIONAL DE EDUCACIÓN SUPERIOR (ENES), que se rendirá en Septiembre del 2015.

Por favor complete el siguiente formulario

***Obligatorio**

Nombres *
Escribir sus dos nombres con mayúscula

Apellidos *
Escribir sus dos apellidos con mayúscula.

GENERO *
 MASCULINO
 FEMENINO

Fecha de Nacimiento *
mm/dd/yyyy

Edad *
Solo escribir el número, el 18 (no es necesario escribir la palabra años)

Correo Electrónico *
Escriba el correo que más use, es por aquel medio donde notificaremos a los seleccionados

The same way as volunteers did their registration; the applicants for the free training should fill a form (Figure 2) and give information about themselves

The information below was required for applicants

- Name
- Surnames
- Gender
- Birthdate
- Age
- Email ID
- Facebook
- Identity card number
- Cell phone
- Conventional Phone
- Civil status
- Legal representative
- Phone Representative
- Home Address
- City
- High School Name
- Category of School (Public or Private)

Applicants had to answer the following questions:

- Are you currently working?
- If you are working, please tell us your schedule of work
- If not, when do you want to start to work?
- If you are graduated, please write the date of your graduation
- If you are student, please write the schedule of school
- How much your parents pay in electricity?
- Could you please write the name of career you want?
- Name of the university you aspire to study
- Why do you think you should be chosen for the course?
- Please give us some reasons why you want to participate

The principal idea to fill the application form is to have a database of applicants and to find a practical way to select people according to their profile, especially to understand what is their priority, work or study. That helps to reduce the dropout rate.

In addition to online registration, it was required the documents below:

- Proof of the student is registered at SNNA.
 - Passport photograph
 - School Report card of their last academic term
 - Invoice of a Service Basic such as electricity and energy or water.
- c. Organization of activities, which was structured to be executed for a period of 5 weeks of classes, covering academic areas of numerical reasoning, abstract reasoning and verbal reasoning that are evaluated in the test.
- d. Recording the results, it was conducted through a database with the following information:
- Execution date
 - Number of applicants
 - Number of classrooms
 - Attendance
 - Report Card of each students

Proposing the academic material according to the subject area of the exam

It was proposed the creation of a brochure based on exercises of previous exams, and as text guide: "Preuniversitario Hawking" author Stephen W. Hawking.

Volunteers prepared the classroom materials. The brochure includes the areas evaluated by the test.

- Numerical reasoning
- Verbal reasoning
- Abstract Reasoning

During the editions, it has collected materials from many previous exams and other reference books which help us to create new study materials, workshops, lessons which are stored digitally with the purpose they can be used in the upcoming editions and can be updated them

Revision of training modules and adding new content

The Educational Content of the project should be updated frequently for that reason the training structure should be analyzed and if it necessary there will a new content to add according to the academic areas.

Table 2. Course Duration In Hours

Academic Area	Hours
Numerical Reasoning	44
Abstract Reasoning	25
Verbal Reasoning	15
Total	84

Analyzing the process of the formation of applicants

The formation was evaluated through:

- Lessons were taken at the end of the each week of classes in order to know the level of learning.

- Workshops with the purpose to provide participants the cooperative learning techniques.

The topics in numerical reasoning were the following:

Table 3 Detailed topics of Numerical Reasoning

Class	Subjects	Time in hours
1	Review of numerical simplification	2
2	Rule of Three simple and compound (forward and reverse)	3
3	Percentage	3
4	Fractions	3
5	Equations	3
6	Equations	3
7	Equations	3
8	Probability	3
9	Solution strategies	5
10	Triangles	2
11	Calculation of areas	3
12	Review Class	4
13	Review Class	5
14	Exam	2

There were teachers involved who helped to prepare and improve the material of the three academic areas.

Participation of extracurricular activities

Each edition is planned external activities to the Project in order to motivate participants and arouse their interest in engineering.

- **Motivational talks:** Professionals from different areas and they give talks on life projects for participants.
- **TISP workshops (Teacher in Services Program)** of IEEE ESPOL Student Branch: It is done workshops with simple tools such as playing cards, pencils, cardboard, etc.; where participants build a device or structure. For example with the cards, the Workshop is about building a structure that will stand the greatest possible amount of weight in order to publicize civil engineering.

Results

The model of a Free Training for High School graduates and students of the last year of secondary has allowed understanding some important aspect of why a great part of them got a low score of approval of the exam. According to the profile of many applicants of the project who took the exam for second time, they had some aspect in common:

- Issues underlying the prior learning field
- Family pressure to get income
- Study Environment

The majority of applicants had those problems, the most relevant was regarding the prior learning, because many of them came to the project without sufficient knowledge. The other two troubles is about the environment where they could be affect by their family because they feel the pressure to work immediately and the study environment influences a lot, that was the reason why in Guayaquil the classes were given at university, the purpose was that applicants can feel the experience to have in a nice classroom around nature and motivated by other students (undergraduates trainers).

During the three editions of the project, the dropout rate has been inevitable (Table 3), however the project has included more activities like talks with parents with the object they can support their sons during the training classes and when their sons go to university.

Table 4. Percentage of deserters of each edition and site

Edition	Sites	Number of applicants	Number of Dropouts	% Desertion
First	Guayaquil ESPOL	40	16	40%
Second	Guayaquil ESPOL	150	40	27%
Third	Daule	163	57	35%
	Guayaquil ESPOL	285	92	32%
	Guayaquil Estatal University	35	15	43%
	Naranjal	120	30	25%

Results of the third edition

The implementation period the last edition of the project was during the month of July and September 2015. Unlike other editions, this one was the first time where it was possible to help people from other cities. Although there were a percentage of dropouts, there were a nice number of approved – Table 4

Table 5 PERCENTAGE OF APPROVED OF THE LAST EDITION

	# Students at the end of the course	Number of class-rooms	Number of Approved	% Approval
Daule	106	4	74	70%
Guayaquil ESPOL	193	1	156	81%
Guayaquil Estatal	20	9	12	60%
Naranjal	90	5	62	69%
Palestina	35	2	20	57%
TOTAL	444	21	324	73%

There were 444 students who attended the most days of classes, the 73% of them approved the ENES exam and nowadays they are applying to a career in a public university.

The universe of registered people correspond to students of schools that are located in disadvantaged areas of each city, where they were held briefings with parents and students for provide them information about free academic training for ENES exam.

Table 6. Some Secondary institutions participants of the project

HIGH SCHOOLS
ATI II PILLAHUASO
CAMILO PONCE ENRIQUEZ
COLEGIO "ATI II PILLAHUASO"
COLEGIO 9 DE OCTUBRE
COLEGIO ELOY ALFARO
COLEGIO FISCAL "ENRIQUE GIL GILBERT"
COLEGIO FISCAL AGUIRRE ABAD
COLEGIO FISCAL ENRIQUE GIL GILBERT
COLEGIO FISCAL GUAYAQUIL
COLEGIO FISCAL MIXTO 21 DE JULIO
COLEGIO FISCAL REPLICA VICENTE ROCAFUERTE
COLEGIO VEINTIOCHO DE MAYO
FRANCISCO DE ORELLANA
JUAN MONTALVO

Conclusion

The new concept of the Project development was to mark a fundamental change in the life of many young people, where it was possible the interaction between undergraduates and school students. The benefits were for both of them because thanks to this project, volunteers increased their abilities as engineer and they could improve their communication skills and they feel more empathy for the others that sometimes it is difficult to learn in classroom. On the other hand, many communities around at ESPOL in Guayaquil and 3 cities received helping in this first process

for the entry to universities. Many families were motivated to support their young members to continue with their studies because it will be the best way to have a good future and they will have professional relatives.

This model did not only help many applicants could get a place at the university, it helped to change the minds of a lot of people involved, parents, teachers, directors, undergraduates and others, it was an example of solidarity and the proof that students who study in an engineer career can improve a problem of their community in their knowledge. Nowadays there are many people interested to be part of this project as volunteers or as applicants for the trainings.

In the last edition, many high school applicants were favored but there were a many groups of students that were impossible to accept by the physical limitations, there were a big demand of students, and the demand will continue to grow because they don't feel sure they could get a high score in the exam. That leads us to think that students need a different way to learn in their schools for that reason in future editions, there will a section to have interactions with teachers of high schools. Especially that the laws in Ecuador are changing in the last years; and there will be modifications regarding the admission exam and if we want to continue with this labor there should be more parts involved in order to help the future generation.

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