

## Aplicación móvil para la evaluación de intereses y aptitudes basada en el test Luis Herrera y Montes

*Mobile application for the assessment of interests and skills based on the test Luis Herrera y Montes*

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### Resumen

Actualmente el móvil se ha convertido en una de las mejores herramientas que permiten obtener información sobre recursos educativos y tecnológicos de manera rápida y sencilla. El presente artículo muestra una aplicación móvil que evalúa los intereses y habilidades de alumnos de nivel profesional y de reciente ingreso con el objetivo de ofrecerles orientación vocacional específica de acuerdo a sus intereses y aptitudes.

Dicha aplicación evalúa las aptitudes y gustos personales de los estudiantes para definir el área donde mejor se pueden desempeñar. Para el desarrollo de este estudio se aplicaron los métodos y herramientas empleados en el área de tecnologías móviles, siendo estos actualmente de los mejores recursos tecnológicos que existen para acceder a sistemas de información.

El enfoque utilizado en esta investigación puede aplicarse a prácticas de orientación vocacional, como exámenes, cuestionarios o bases para evaluaciones psicológicas, etcétera.

**Palabras clave:** aplicación móvil, orientación vocacional, tecnología móvil.

## Abstract

Currently the mobile has become one of the best tools that allow information about educational and technological resources quickly and easily. This article shows a mobile application that evaluates the interests and abilities of students of professional level and recent entry in order to offer them specific vocational guidance according to their interests and skills.

The application evaluates the skills and personal tastes of the students to define the area in which they have better performance. The development of this study applied methods and tools used in the area of mobile technologies, which are currently the best technological resources that exist to access information systems.

The approach used in this research can be applied to practices of vocational guidance, such as tests, quizzes, or bases for psychological evaluations, etc.

**Key words:** mmobile application, vocational guidance, mobile technology.

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## Introduction

Mobile applications are currently one of the best tools for control and access to information, also can be applied practically in all areas of daily life. Here is the design of a mobile application that provides support to students to orient themselves on any branch of studies provided by the institution.

A mobile application is a portable software created to carry out specific tasks that facilitate the activities of persons from a mobile device. This application is intended to determine the vocational orientation of users.

Vocational guidance is a process that aims to awaken vocational interest and adjust these interests to the competence of the subject and the needs of the labour market (Anthony & Cols, 1984).

With an adequate vocational guidance, it is possible to choose a career that promotes the proper performance of a profession, creating the possibility of aspiring to a good job.

The development was a mobile development platform called "AppInventor" of blocks based on Java language programming. For the proper use of the application should access the website of the Technological Institute of Colima from the mobile device and download the application by clicking on the banner information.

During the analysis process, taking into account the documentation obtained, a model of the system was designed, which served as the basis for the development and documentation of the mobile app. This model describes the functionality of the system and the interaction that the student has with the application through stored procedures and queries of databases (see Figure 1).

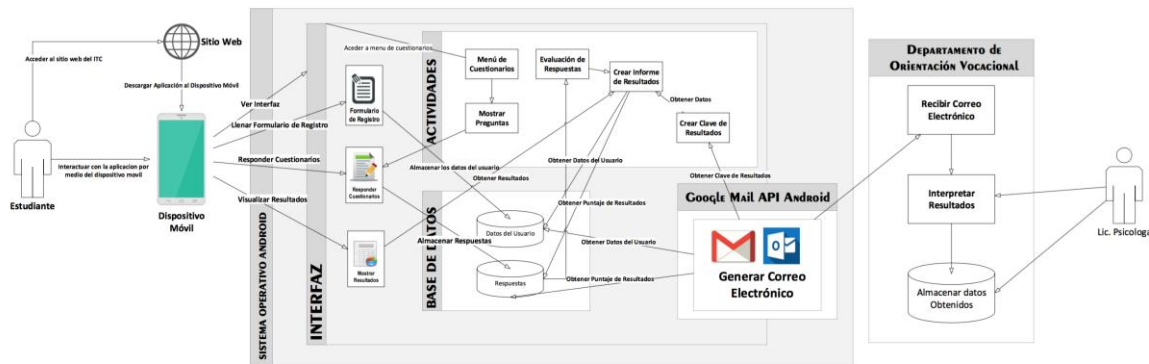


Figure 1. System model developed

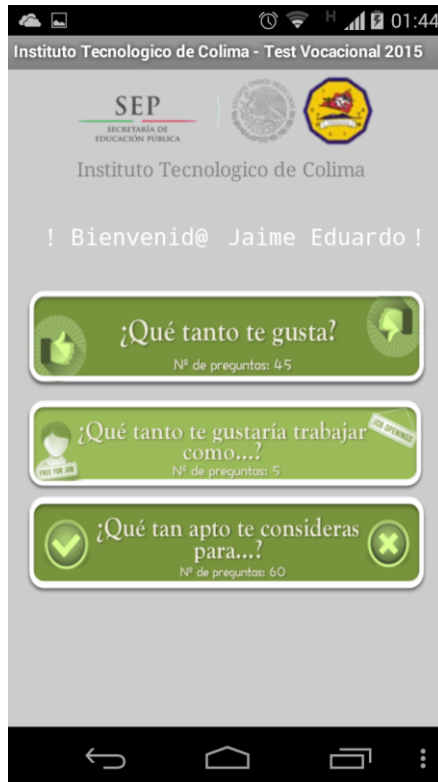
The student interacts with the mobile device to access the activities of the application through the application interface.

Once installed the application, students must provide their personal data: name (s), last name, mother's maiden name, age, sex, academic data, account number and race, historical data as a school of origin and technical careers; and provide an image of himself or take himself a picture with the camera of the device (see Figure 2).

**Figure 2. Registration form of personal data and academic**

Following the above, it can access the application interface, which displays the welcome menu (see Figure 3). There are questionnaires to be performed, which are:

- **How much do you like ?:** This questionnaire consists of 50 questions about the tastes of the student about certain activities of daily life.
- **How much work as you like ?:** This questionnaire consists of 10 questions, which serve to discover the tastes of students in the workplace.
- **How apt to consider yourself ?:** This questionnaire has 60 questions about the skills of students in some activities or situations that arise in everyday life.



**Figure 3. Welcome screen menu**

## Questionnaires

### Questionnaire interest and aptitudes

The questionnaire has undergone various psychometric studies. To check its validity was used as external criteria INVENTORY Kuder Vocational Preference, finding that the 10 scales that are significantly correlated to .001; the internal consistency coefficient was obtained through the method of split-half with a value of 898, indicating that this instrument is accurate, precise and consistent measurement. The first study was conducted by Reyes Hernandez (1986) in a population of adolescents and the second by the author in 1987 (Ma. Enedina Hernández Villegas, 2009).

The questionnaire can be used to measure interest in the knowledge that will yield results and objectives with the advantage that saves time, material and effort; also it was prepared taking into consideration the cultural variables, which today are rarely taken into account for this type of document.

Before you see the questions in the application appears vocational historical information questionnaire Luis Herrera and Forestry, its purpose and some recommendations of the authors to achieve a better evaluation. Below are instructions for the correct answer, and a list in tabular form showing the subsection and their point values for the selected test. You should read carefully the information and record it was understood (see Figure 4).

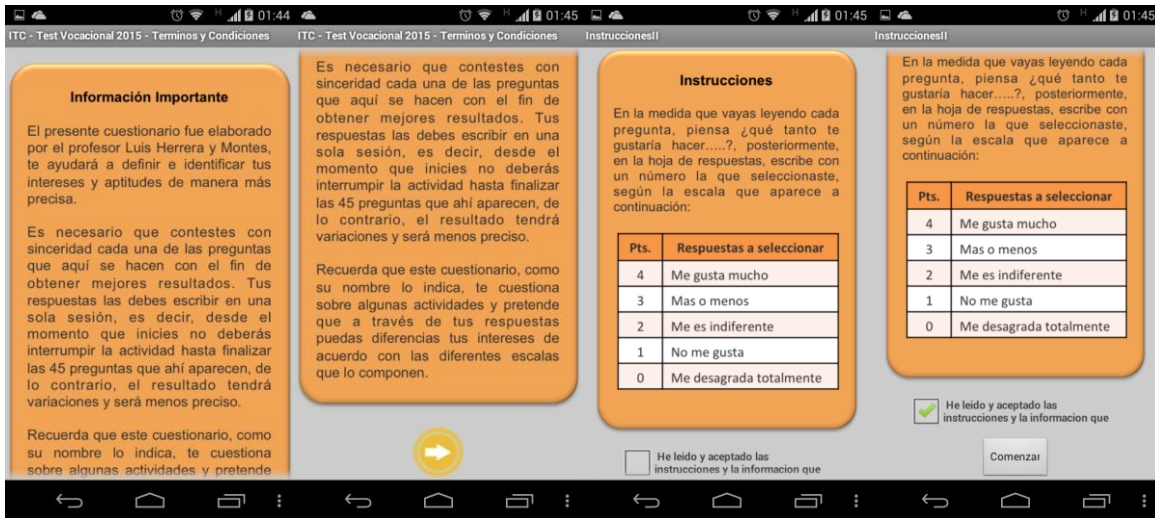


Figure 4. Information and instructions of the questionnaire

The question screen was designed in an intuitive and organized way for the student's attention go directly to the question and then see the possible response options (see Figure 5).

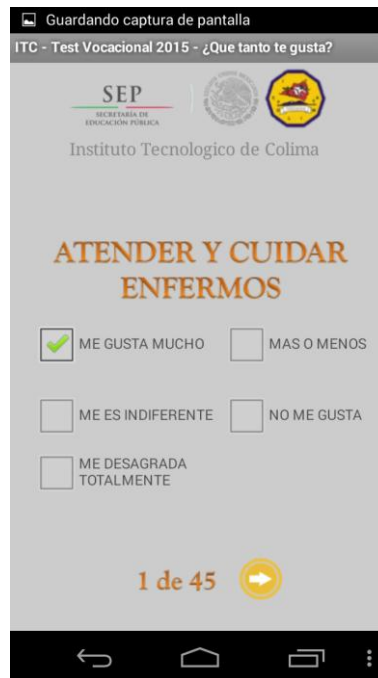


Figure 5. Screen Questions

## Questions

### Questions of interest

The list of questions in each questionnaire was made from a selection of areas of interest in people:

- • **Social Service (SS):** Refers to the taste for serving others, first to those in need, children and elderly.
- • **Persuasive Executive (EP):** Refers to like dealing with people, who like to impose their views, convince others regarding a project to sell an item, and so on.
- • **Verbal (V):** Refers to the pleasure of reading or pleasure to express their ideas in oral or written form.
- • **Visual Arts (AP):** Refers to taste do manual work type, using combinations of colors, materials, shapes and designer.
- **Musical (Ms):** It refers to the taste for playing musical instruments, singing, dancing, reading about music, concerts, study the life of prominent composers, and so on.

- **Organization and Office (Og):** Refers to the taste for a type of desk job that requires accuracy and precision.
  - **Scientific (Ct):** Refers to taste the real reason to investigate the facts or things, to discover its causes and solve problems of various kinds, for scientific curiosity and not thinking about the economic benefits that may result from the investigation.
  - **Numerical Calculus (Cl):** Refers to like working with numbers.
  - **Mechanical (Mc):** Refers to the preference for working with machines and tools, building or fixing mechanical objects, furniture, appliances and so on.
  - **Outdoor (Al):** Refers to the taste for spending most of the time in the field, in the woods or at sea, and grow plants and care for animals.
- (Ma. Enedina Villegas Hernández, 2009)

### Questions abilities

The list of such questions was made from a selection of the areas in which the student can perform after completing their studies. The questions are based on their areas of interest, because if the student can develop interest in an area, you can also learn skills to perform tasks within it. Areas as skills are:

- • **Social Service (S.S):** Refers to the ease in understanding human problems and provide effective help to those who require it.
- • **Persuasive Executive (E.P.):** Refers to the facility to organize, supervise and direct others.
- • **Verbal (V):** Refers to the facility to handle properly and accurately spoken or written language.
- • **Plastic Arts (A. P.):** Refers to the ability to appreciate works or create harmonic shapes and colors.
- • **Musical (Ms):** Refers to the facility to capture, distinguish and combine harmoniously play sounds.
- • **Organization (Og):** Refers to the ability to organize and systematize data.
- • **Scientific (Ct):** Refers to the facility to capture the rationale of phenomena, understand the underlying causes and principles of these.



- **Calculation (CI):** Refers to the facility for fast and efficient handling of numeric operations.
- **Mechanical Constructive (M.C.):** Refers to the ability to understand, design and build devices and to project objects coordinated and precise movements.
- **Manual Dexterity (M.D.):** Skill in the use of hands and fingers, easy to implement coordinated and precise movements.

(Ma. Enedina Villegas Hernández, 2009)

Each area has its questions clearly identified. To achieve a level and versatile quiz questions are mixed so that each go changing the area of interest; therefore, if we list the questions from 1 to 10 according to the test in question, there is one question from each area that is ordered according to a table, which appears in the following figure.

S.S.	E.P	V.	A.P.	Ms.	Og.	Ct.	Cl.	M.C.	AL.
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

**Figure 6. Table Distribution of questions by area**

### Replies

The answers are stored in a database that stores the number of questions, the score of the response that records the student and the number of test answering. This facilitates counting points because when a settlement is completed, this is crossed, adding points and pocketing all the answers in a single variable to use in the evaluation procedure.

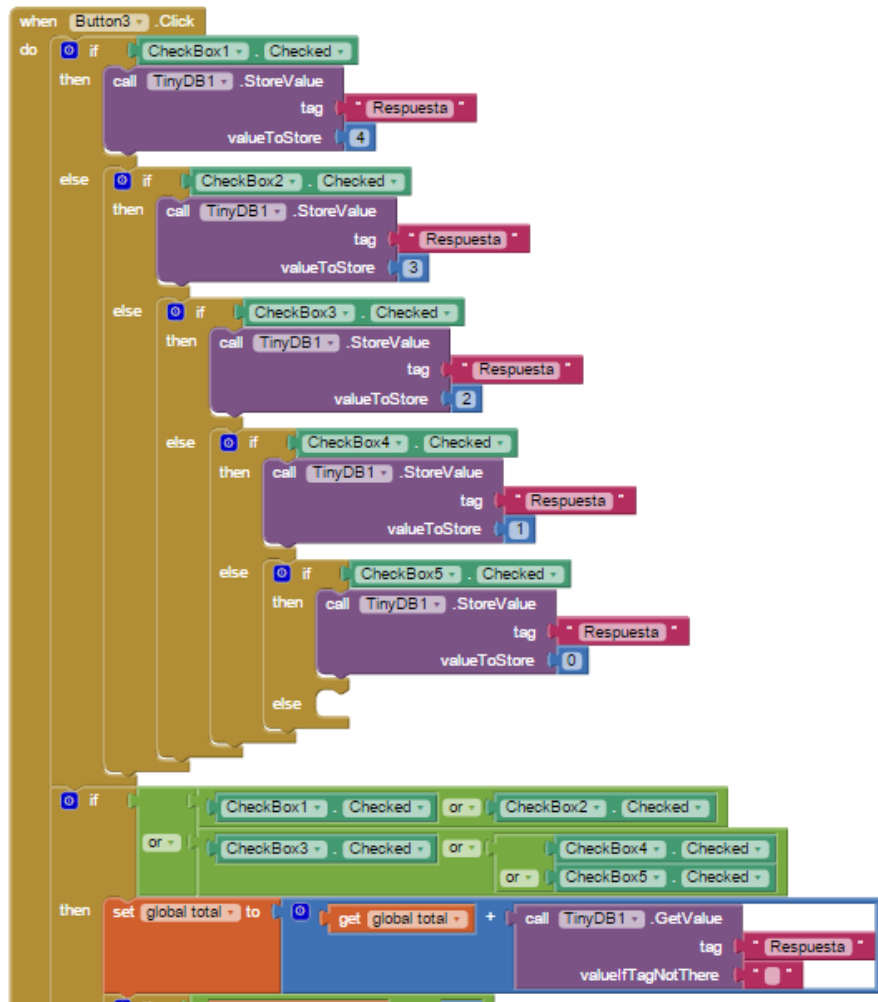


Figure 7. Procedure responses storage database

### Evaluation

The evaluation is carried out once the student answers all the test questionnaires because each response is important to perform this procedure.

The process of evaluation and interpretation of results is performed by comparing the score and the percentage who obtained the student with their answers.

By consulting the scores of answers in the database, the individual variables are emptied and scores of similar areas in addition to the number of questions. After obtaining the total, the response rate is derived by a rule of three, which reflects the percentage of the area. For instance:

**Questions of Social Service**

Pregunta	Respuesta	Porcentaje
1	3	12.5 %
11	4	16.6 %
21	1	4.16 %
31	4	16.6 %
41	2	8.33 %
51	4	16.6%
<b>TOTAL</b>	<b>18</b>	<b>74.79 %</b>

**Table 1. Table of scores and percentage of area social service**

**Social Service score:** 18 pts.

**Interest rate Social Service:** 75%

If the percentage is less than 50% on average areas, it means that the student does not show interest or skills to perform some (s) area (s), if it is over 50% means that the student has an average interest If the percentage exceeds 75% indicated that their interest and skills are suitable for activities within the areas evaluated, If the percentage gets to be between 90% and 100%, it means that their preferences and aptitudes are positioned to play any work or activity within the areas evaluated.

Once you have made individual assessments by area, the score of all areas is added and stored in individual variables then represent them in the detailed results, in which the total points of each questionnaire are obtained, which is also stored individually. After the evaluation, the results are stored in the database and displayed in a report.

## Representation of results

The presentation of results is performed by means of a report, which displays information about that student and the total scores obtained by questionnaire (see Figure 8).

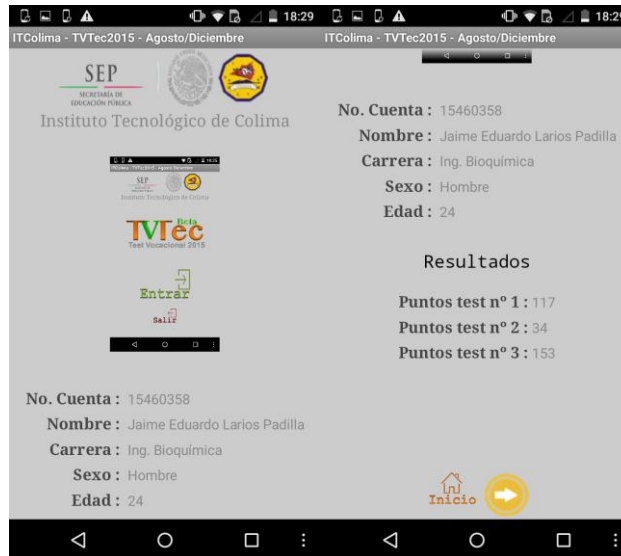


Figure 8. Overview of the student results

Then these totals are broken down to show detailed scores and percentages of each area of interest and highlight the scores and more representative percentages in green, which are stored in the database to create the registry key required results department staff vocational guidance (see figures 9 and 10).



Figure 9. Detailed presentation of results of the questionnaires 1 and 2

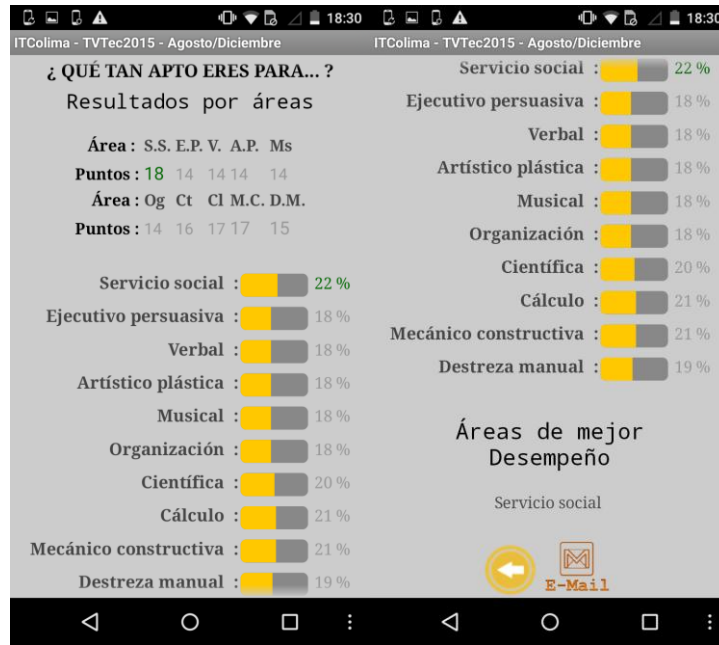


Figure 10. Detailed report of results of the questionnaire 3

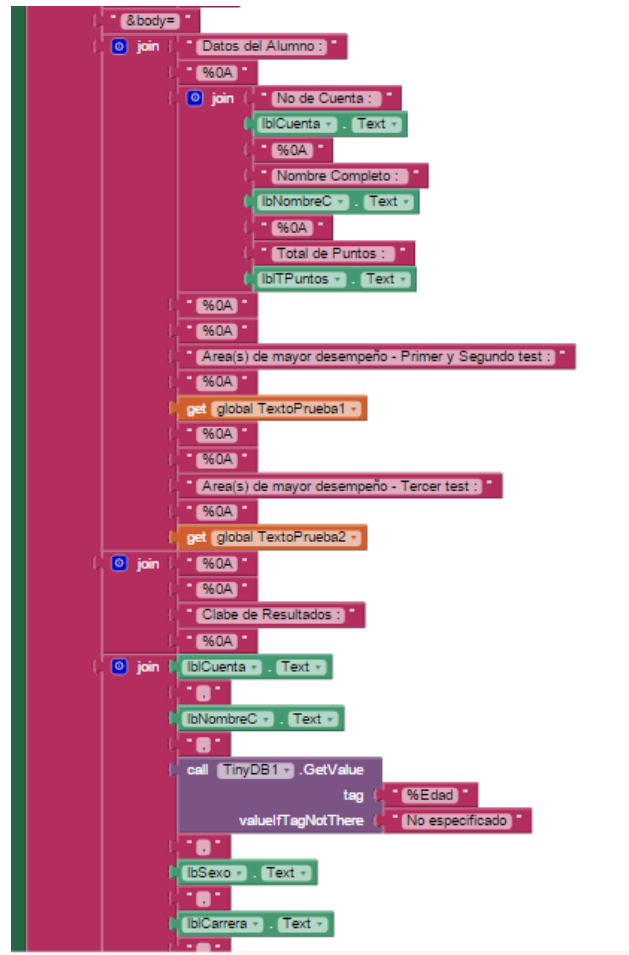
### Key results

The key result is a concatenation done automatically using stored procedures that query the database for specific information stored in the questionnaire response procedure in the application. The data within the key are:

- **Number of Account:** Account number registered by the student.
- **Name:** Name of the student,
- **Age:** age of the student.
- **Gender:** Gender of student.
- **Race:** Race in which the student is enrolled.
- **Bachelor:** Bachelor of origin.
- **Career Technical:** Technical high school career comes.
- **Forane:** Shows if the pupil is foreign, "Yes" or "No".
- **Scoring:** total test score.

**Example:**

**“09160948, Juan Alfredo López Villa, 24, Hombre, Ing. en Bioquímica,  
Bachillerato Técnico No 1, Bachiller, No, 381”**

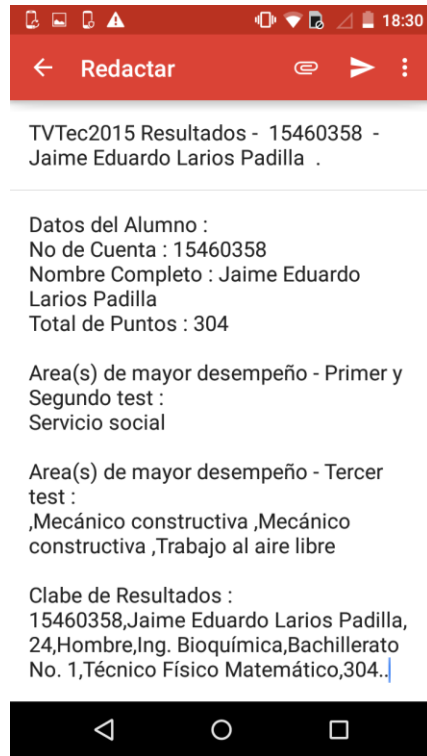


**Figure 11. Faction code that performs the concatenation of the key results**

**Email Template - API GOOGLE Mail**

The application has a procedure that sends an email to the department responsible for vocational guidance with the results of the test. This procedure was performed using Android action code, which when executed sends for the email application google API to send emails; by this method the results as parameters of information to the person in charge of the department in charge. In the subject line the name of the application, the account number and the full name of the student is placed; in the body of your student data shows the total score that obtained in the test also shows areas of increased performance of the

questionnaire 1 and 2 and after questionnaire 3, and finally the key results are placed. Mail is ready to be sent (see figure 12).



**Figure 12. Viewing the email with the data**

### History students

Once the party responsible for vocational guidance students receive emails from the application and after reading each email, take the key results and placed in an Excel format named "TVTec2015 - List of results students "which is a log results show that apart from a history of test results, has a statistics section raised by the department to facilitate the preparation of various reports indices attention of students, reports how it has evolved the student interest period by period to make practical decisions and improve areas of little interest, obtaining a student more interested and committed to the courses offered on campus.

## **Conclusion**

This research aims to support students to learn about the skills they have in different areas of knowledge and thus have a vocational guidance to help them choose the best technical or professional career

The Test of Luis Herrera and Montes is an excellent tool for guidance on the areas of knowledge that promote adequate performance by students throughout their education. It is noted that there are few schools or institutions apply these tests as an assessment tool for students, focusing only on their intellectual level.

Applying this test shows a different approach that tries to be different examinations; also currently social interaction as a tool is used.

Finally, the following recommendations are made: to develop a data warehouse that allows to extract information from the system for decision-making, applying statistical correlation to identify the stored data, and extend the application to various operational and execution platforms.



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