El género femenino en el aprendizaje de carreras de ingeniería tecnológica

The female in learning engineering technology careers

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Resumen

El objetivo del estudio fue dar seguimiento al Taller Interactivo, es decir, el programa de aprendizaje que apoya la incursión de estudiantes del género femenino en carreras de ingeniería tecnológica. Para ello se utilizó una metodología basada en diseño experimental, documental y de campo, corte transversal con una población de 124 estudiantes y una muestra de 86 estudiantes del género femenino en tres carreras de ingeniería, así como material, trayectorias académicas y cuestionario de satisfacción académica. Los resultados mostraron dos vertientes ya que el índice promedio de deserción en las carreras es de 4.2, mientras en las alumnas que recibieron el taller es de 1.12. Por otro lado, el índice de reprobación en estas carreras es de 62.2, mientras que en las alumnas que tomaron el taller es de 23.66.

Con respecto a los resultados de satisfacción académica, los estudiantes se mostraron de acuerdo con el contenido de la unidad de aprendizaje, el desempeño del profesor y el desempeño de sí mismos como estudiantes.

Palabras clave: género femenino, tecnología, deserción, reprobación.

Abstract

Objective: To monitor the interactive workshop, learning program that supports raid in engineering technology careers for female students. Methodology: experimental, documentary and field design, population cross section with 124 students and 86 students

shows three female engineering careers. Material, academic trajectories and Academic Satisfaction Questionnaire. Results: The two hypotheses are accepted because the average dropout rate in the races is 4.2, while the students who received the workshop is 1.12. On the other side, you can also see the failure rate in these races is 62.2, while the students who received the workshop is 23.66.

Regarding the results of academic satisfaction observed, these are acceptable in accordance with the contents of the learning unit, teacher performance and the performance of themselves as learners.

Introduction

This research shows the way in which the female has dabbled in engineering technology careers, for which academic followed up on the students who took the Interactive Workshop (TI) taught when they were studying the third year of high school with the aims to raise enrollment in the area of technological engineering.

The interactive workshop is an innovative learning program presented, motivated and approached the female participants the area of technology. In 2013, González Pineda and created and implemented the interactive workshop, after which they observed a 1.3% increase in female enrollment in technological fields (Gonzalez and Pineda, 2015).

Therefore, this research aims to track 86 students enrolled in the second year of racing Engineering Technology (computing, electronics, sustainable energy systems) for the impact on his academic career and welcomed the study.

Why do we continue to monitor the interactive workshop?

The impact of the Interactive Workshop on teaching and using technology as specified by the United Nations in its documents, indicates that this type of learning is the basis and developing countries worldwide (UN, 2013) .

In Mexico, the National Council of Science and Technology through the Scientific and Technological Consultative Forum held in April 2014 and aimed at legislators and rulers, made clear the level you currently have in science and technology and from there create policies and educational programs they are aimed at technological development (Scientific and Technological Consultative Forum, 2014).

So, we can say that promote learning and the use of technology consistent with current teaching-learning policies that seek to ensure the development of our country.

Why do we focus on the gender phenomenon?

Because we agree to seek the most marginalized in both education and our country's economy sector.

Since 2001, the International Labour Organisation (ILO) has promoted the work in the information economy, because technological resources needed to ensure productivity in a global economy. This document focuses heavily on the work of the information economy to the female gender, which provides "power capacity" for women to improve their standard of living and more equitable income relative to men (ILO, 2001).

In the educational aspect women have struggled to compete much work scientifically; men have been awarded major scientific awards, relegating women to the background (Espasandín, 2013).

It was not until the twentieth century when the world began to recognize the efforts of women in 1901 to give the Nobel Prize to Marie Curie. Since then, the prize has been awarded to fourteen women in the areas of Physics, Chemistry and Physiology or

Medicine. In other multidisciplinary categories, three leaders have received this recognition (León, 2010).

Intellectual capacities for learning and technology development

Brain morphology studies have shown that women have 11% more neurons dedicated to memory, language, follow logical, sound and emotions sequences. This present better abilities to acquire new knowledge about the ability of concentration, dedication and perseverance to the study, due to the high levels of progesterone (Brizendine, 2006). This sets the tone to specifically stimulate learning technologies.

However, there is still gender inequality in technology professions. Catriona Davies says the study by Berry (2011), which found that women face a glass ceiling for career advancement: "Almost two thirds of respondents were over 10 years of experience in the technology sector, but only 26 % of them had reached levels of management or directors "(Davies, 2012, p. 78).

The most vulnerable group are the "Ninis", since in Mexico 1 in 10 young men have no jobs or are studying, whereas in the case of women are 3 out of 10. It also noted that most young women who do not work, or study, or pursuing some training, engaged in home care dissociated from cultural aspects (OECD, 2012).

Benefits of ICT education and family education benefit

Regardless of ability to have women to learn technology, or else they have proved successful in this area, we must not forget the influence of his family and children.

Institutions worldwide have proven that the mother's education affects their children because the more educated the more likely it is that they become successful. Based on the first level of learning, which is imitation, we can say that a mother educated in a specific area transmitted by example their skills and their way of seeing and resolving life (UNICEF Gonzalez, 2013).

In addition, the study of the socioeconomic factors that affect learning, made with top-level population of the Autonomous University of the State of Mexico, found that undergraduate level is present the influence of the educational level of the mother (González, 2013).

The figure of the mother in the education of children is irreplaceable and the benefits of a mother with knowledge in the area of technology is directly proportional to the continued growth in industrialized countries and the advancement of developing countries.

In Mexico, the statistics reveal that the inclusion of higher education in the technology area is occupied mainly by males (72%). If you prepare women in the area of technology will impact the family education since its inception (National Institute for Women, 2013).

Educational technology policy of the institution under study
The Autonomous University of Mexico, with the proposals of the Rector of Institutional Development (PRDI) Plan calls upon the instruction and management of technology to facilitate the inclusion of university in the labor sector. Asserts that: "You have significant advances in the use of technology in classrooms and Educational Services Platform (SEDUCA), mainly to support classroom activities. The expected result is that more than 1033 projects to support multimedia teaching will be generated, which translates to 5716 students and 656 teachers using the SEDUCA "(PRDI, 2013-2017, p. 67, and González portal Pineda, 2015).

All development and implementation of the workshop was implemented in the Educational Services platform, SEDUCA belonging to the UAEM. To measure the cognitive impact Questionnaire for University Learning Strategies (CEA-U) was used to evaluate: 1) the motivation to the study, 2) the cognitive process and 3) actions to learning (Gonzalez and Pineda, 2015) .

Background of the population of the institution under study
In the UAEM it can be seen that 18 study centers (faculty, colleges and academic units) that provide careers that are focused on technology, enrollment of women reported 33% and

men 66%. Respectively, racing Computer Engineer, women reached 26.3% and 74.7% men; Mr. Computer Management, 49% and 51%.; Systems Engineer and Communications, 26.8% and 74.2%; Intelligent Systems Engineer, 29% and 71%; Software Engineer, 26.3% and 74.7% (Statistics 911, 2012-2013, in Gonzalez and Pineda, 2015).

The average annual income in careers focused on technology, from 2009 to 2013 is 0.93% for both genders, although 0.82% for females (Gonzalez and Pineda, 2015).

General purpose

Measuring learning impact of the Interactive Workshop in rates of failure and dropout in engineering careers.

Specific goal

Knowing the level of school satisfaction Student Satisfaction Questionnaire.

Methodology

The design used was not experimental, documentary and field, with cross section.

The population was 124 students, where a sample of 86 students of the third semester was obtained in the area of Engineering Technology (computing, electronics, sustainable energy systems) of the Autonomous University of the State of Mexico.

The material consisted of academic careers of students enrolled in the third semester of engineering careers and Student Satisfaction Questionnaire.

The Student Satisfaction Questionnaire to generate basic information consists of two sections: importance and performance:

• Content of learning unit

• Methodology

• Available infrastructure

• Teacher Performance

• Student Performance

The values are based on the Likert scale, with reliability coefficient $\alpha = 0.81$; evaluation ranges from: very dissatisfied to very satisfied = 1 = 5; minor = 1 key = 5 (Jiménez G. Terriquez C. y Robles Z., 2011).

Hypothesis:

H_1 The application of interactive workshop in students dropping out decreases racing technology area within the UAEM Engineering.

H_0 The application of interactive workshop in students does not decrease descension racing technology area within Engineering UAEM.

H_1 Application of Interactive Workshop on reducing the backlog students careers the area of technological engineering in the UAEM.

H_0 The application of interactive workshop in students does not decrease the backlog in the area of race engineering technology within the UAEM.

Study Procedure

1. Locate the School Management Control account number of students in the area of engineering technology for the population and the sample.

2. Apply them formats: a) consent and responsibility to be signed in study b) format data protection.

3. Analyze the academic trajectories of 86 students for general averages and academic backwardness.

4. Locate the School Management Control account number of students who were enrolled in the interactive workshop and had descension in college.

5. Locate the School Management Control account number to students who were enrolled in the interactive workshop, which were registered in the first semester and are not currently enrolled in third semester to meet descension index.

6. Apply the student satisfaction survey to know the levels of perception of the student's academic and administrative career services currently enrolled.

Statistical procedure

Application of descriptive statistical analysis used in program SPSS -19.

1. Apply descriptive analysis to know the distribution of the sample according to the race registered as the average age of students (see Table I).

2. Apply descriptive analysis to determine the frequency of dropout and failure rates (see Table II).

3. Apply descriptive analysis to know the satisfaction rates of school students report to the academic and administrative services (see Table III).

Results

Sample characteristics: mean age 20.2 años (see table 1).

Table 1. Características de la muestra

Carreras	Población total	Población en mujeres	Muestra	Edad promedio en años
Ing. en Sistemas	268	55	42	20.1
Ing. en Cómputo	116	60	38	20.2
Ing. en Electrónica	132	9	6	20.3
Total	516	124	86	20.2 prom.

Estadísticas 911, 2012-2013, UAEM.

Tabla II. Índices de deserción y reprobación escolar

Carreras	Muestra primer semestre	Muestra tercer semestre	Deserción	Índice de deserción	Índice de reprobación
Ing. en Sistemas	42	33	9	1.27	25
Ing. en Cómputo	38	34	4	0.89	32
Ing. en Electrónica	6	5	1	1.2	14
Total	86	72	14		
Índice promedio				1.12	23.66

Dirección General de Control Escolar, UAEM (2015)

Tabla III. Niveles de satisfacción del estudiante

Escalas	Contenido de la unidad de aprendizaje	Metodología	Infraestructura disponible	Desempeño del profesor	Desempeño del estudiante
Importancia	Muy importante	Importante	Importante	Muy importante	Muy importante
Desempeño	Satisfecho	Poco satisfecho	Poco satisfecho	Satisfecho	Satisfecho

Cuestionario de Satisfacción del Estudiante, aplicación septiembre 2015

Conclusions

This study analyzes the impact of the Interactive Workshop on students. For it is part of the general statistics that are reported in the Statistical Agenda 2014, which shows that dropout rates in these races is 4.2, while the students who took the workshop is 1.12. On the other hand, one can also see that the failure rate in these races is 62.2, while the students who took the workshop is 23.66. Therefore, the hypothesis is accepted as true.

To have more elements to explain why these findings, we took on the task of applying the questionnaire school students examined satisfaction.

You remember that one of the first axes of interactive workshop taught the same students was the motivation, knowledge management and technology area to induce enrollment in engineering careers.

The questionnaire covers five subscales measuring:
Content aprendizaje.- unit Here the students qualify developing the learning unit, and the clarity and fulfillment of its objectives. They consider it an important element of the race, with which they are satisfied.

Scale metodología.- The students consider important and unsatisfactory, and that the workshop taught with specific and systematic teaching materials; also they are not expressed in the races.

Scale Infrastructure.- The students find it important and unsatisfactory because the infrastructure they face does not fit the learning needs.

Scale performance profesor.- This aspect is considered very important and satisfying. To the students were taught in the workshop it was very important the attitude they had teachers so that they acquire knowledge, because trust creates the teacher gives them the opportunity to participate and make a meaningful learning.

Scale estudiantes.- performance is considered very important and satisfying. Interactive workshop were given tools for knowledge acquisition.

Earlier learning strategies acquired in Interactive Workshop support the students to venture into racing the area of science and technology, with a systemic bias that was implemented in electronic platform to know the use of the systems and their benefits in daily living (Razo, 2008).

This shows that progress in female enrollment in the area of information is appropriate. It is known that educational achievement in different educational areas at the college level is higher than the female gender, highlighting the advantage because of their innate abilities of concentration and memory (Echavarri, Godoy, Olaz, 2007).

Do not forget the waterfall intended effect with this type of learning in ICT, very appropriate activity for the roles that women play in caring for children. Childcare and make a productive activity in the economic field is a dream of mothers (Arellano, Márquez y Pérez, 2013).

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