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# Relational analysis of the graduation profile of the unified general baccalaureate and the academic offer of the Pedagogy in Experimental Sciences and Computer Science degree program

## Análisis relacional del perfil de egreso del bachillerato general unificado y la oferta académica de la carrera de Pedagogía en Ciencias Experimentales Informática

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(Received on: 14/11/2021; Accepted on: 18/11/2021; Final version received on: 22/12/2021)

Suggested on: Cabascango-Trávez, G., Pérez-Narváez, O., Guaña-Moya, J. y Salgado-Reyes, N. (2022). Relational analysis of the graduation profile of the unified general baccalaureate



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Revista Cátedra, 5(1), pp. 114-124, January-June 2022. e-ISSN: 2631-2875

<https://doi.org/10.29166/catedra.v5i1.3428>

and the academic offer of the Pedagogy in Experimental Sciences and Computer Science degree program. *Revista Cátedra*, 5(1), 114-124.

## Abstract

In the course of high school, Ecuadorian students take the exam Ser bachiller, a component that allows access to higher education, that is why this research focused on knowing the factors that affect the relationship of the graduation profile of the students of the Unified General Baccalaureate for the entrance to the Pedagogy Career in Experimental Sciences of Computer Science of the Faculty of Philosophy, Letters and Educational Sciences at the Central University of Ecuador. Non-experimental research was carried out, with a field approach, at a descriptive level, using quantitative methodology, data was collected; in addition, a test was conducted, which worked with the students entering the career as essential informants and data was processed using SPSS 23 statistical software. Among the main findings, it was evidenced that the students graduated under the BGU program of study evidence certain deficiencies before the demands of the entrance profile required by the Central University of Ecuador, also that the skills and abilities acquired by the BGU students are elementary, and the expectations that the students reach the level of excellent achievement is scarce; decreasing the possibilities of entering higher education.

## Keywords

Unified general baccalaureate, computer science, academic offerings, entrance profile.

## Resumen

En el transcurso de la secundaria los estudiantes ecuatorianos se presentan al examen Ser bachiller, componente que permite el acceso a la educación superior, es por ello que la presente investigación se enfocó en conocer los factores que inciden en la relación del perfil de egreso de los estudiantes de Bachillerato General Unificado para el ingreso a la Carrera de Pedagogía en Ciencias Experimentales de la Informática de la Facultad de Filosofía Letras y Ciencias de la Educación en la Universidad Central del Ecuador. Se ejecutó una investigación no experimental, con enfoque de campo, de nivel descriptivo mediante la metodología cuantitativa se tomó datos; además se realizó un test, mismo que trabajó con los estudiantes que ingresan a la carrera como informantes esenciales y se procesó datos mediante el software estadístico SPSS 23. Entre los principales hallazgos se evidenció que los estudiantes graduados bajo el programa de estudio del BGU evidencia ciertas falencias ante las exigencias del perfil de ingreso que requiere la Universidad Central del Ecuador, además que las habilidades y destrezas adquiridas por los estudiantes del BGU son elementales, y las expectativas que los estudiantes alcancen el nivel de logro excelente es escaso; disminuyendo las posibilidades de ingreso a la educación superior.

## Palabras clave

Bachillerato general unificado, informática, oferta académica, perfil de ingreso.

## 1. Introduction

Access to education is a right in Ecuador (Constitution of the Republic of Ecuador (2008), and offering quality education with skills for the workplace and personal development is a priority for the United Nations and UNESCO. In this sense, the country has established state policies that are currently necessary and that promote a better competitive education, however, the lack of competencies presented by students at the secondary level are due to the error in the educational system, as asserted by (Terán et al., 2016, p.42).



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Revista Cátedra, 5(1), pp. 114-124, January-June 2022. e-ISSN: 2631-2875

<https://doi.org/10.29166/catedra.v5i1.3428>

In the search for educational quality, the country has mistaken its objectives by overloading the teacher with work mostly in the administrative aspect over the needs of the student, making this focus on the need to comply with the work requested by the authorities, leaving aside the primordial which is the education oriented to students; maintaining a unified general high school, which shows absolutely the opposite of what was expected. Such is the point that, if in 2017 Ecuador participated in the PISA D tests trying to reach the average of the tests, in 2018 according to the director of the National Institute of Educational Evaluation (INEVAL) it was decided not to participate and wait to perhaps be able to participate in the 2024 tests (Rosero, 2019).

Aligned to the above, a call is made to make the necessary changes in secondary education that needs to rethink the subjects and content of the Unified General Baccalaureate (BGU), in addition to the time assigned to them; because it is not how much a subject covers but the quality of it and above all that the knowledge is accurate for the student. Ecuador, being a third world country, faces problems in education on several fronts, the first being social segregation in urban versus rural areas. In urban areas there are different limitations such as access to certain resources such as computers, internet, laboratories and even in spite of being in an area where it is believed that there should be no shortages; these types of limitations still persist, but most of the problems arise within the education system.

In 2013, INEVAL was created, which has as its occupation to cause the educational quality through the educational system that is executed at the moment. Seeking in the student to show the learning achievements as fundamental indicators for the quality and educational performance; but essentially to establish the foundations for the development of a country.

Since 2014 the tests to be a bachelor in Ecuador are presented with the aim of determining the level of knowledge in basic areas such as Mathematics, Language and Literature, Natural Sciences, Social Sciences, same that according to INEVAL (2018)

The Ser Bachiller exam contributes 30% to the final grade for graduating with a bachelor's degree, the average obtained in the upper basic sub-level contributes 30% and the average of the three years of baccalaureate with 40%" these last two correspond to the final graduation grade. Therefore, it is imperative that the graduation profile of students in the last years of high school be aligned with the guidelines set forth in the Ser Bachiller tests (p. 11).

Every year, secondary school students graduate and aspire to continue their student life in higher education, but these aspirations are often stalled by shortcomings in the knowledge acquired previously and the educational profile that higher education requires. It is here where it is necessary to match the actions that occur in the two areas and to know how much one influences the other.

Currently in Ecuador, the INEVAL establishes the elementary level as achieved, in terms of the Ecuadorian baccalaureate, that is to say, it only meets the basic expectations. In the future, if education continues in the same way, it will not be able to train high school graduates different from the one currently being trained. And if the demands are higher, education will decline. That is why the BGU, no matter how pompous it may sound, will not provide a solution; the alternative is to improve what we are doing wrong. The alternative is to improve what we are doing wrong, and that the expectations of the educational level reach more competitive levels.

Accordingly, this study seeks to know some edges to determine the relationship of the graduation profile of the students of the Unified General Baccalaureate for the entrance to the career of pedagogy in Experimental Sciences of Computer Science of the Faculty of



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<https://doi.org/10.29166/catedra.v5i1.3428>

Philosophy, Letters and Educational Sciences at the Central University of Ecuador. For this purpose, the following specific objectives are established:

- To diagnose the skills acquired by students during the unified general baccalaureate in the areas evaluated by the baccalaureate program.
- Determine the relationship between the skills of the entrance profile for higher studies to the Pedagogy in Informatics career and the graduation profile of the Unified General Baccalaureate that allows access to the university.
- To establish the level of knowledge that students have in the subjects of the common core to enter the pedagogy career in computer science.

Consequently, the study is structured in the beginning of illustrations concerning the baccalaureate in its basic aspects, in addition to formative experiences about the BGU, after which concepts and definitions are presented in relation to the unified general baccalaureate. Consequently, the methodology used during the research design is presented, which contains a quantitative field approach, with documentary support and explanatory level, followed by the results obtained, and finally, the conclusions are presented.

## 2. Theoretical Foundation

According to the Ministry of Education, the exit profile is defined on the basis of three fundamental values: justice, innovation and solidarity, and establishes, around them, a set of capacities and responsibilities that students must acquire during their transit through compulsory education (...) written in the first-person plural, so that students may appropriate it and take it as a reference in their daily work in the classroom (Ministry of Education 2019). On the other hand, the entry profile or coverage is the supply capacity achieved by an educational system to satisfy all social demand, in all school grades and in all geographic spaces of a country. Coverage relates the number of students enrolled to the total number of young people of school age and with the option of pursuing basic, secondary and high school studies.

Research conducted at the Latin American Faculty of Social Sciences -FLACSO Ecuador by Santana (2015) explains the causes for the implementation failures in the high school education policy in Ecuador, starting with the LOEI 2011. The study focuses on public policy failures, the failure of governance, the failure of the State mainly. In this sense, they establish that it is important for the government in office to focus its support on education as a priority, and thus establish parameters to show improvements in the education system. To deliver to society graduates with knowledge adequate to the needs of society, but this will not be achieved if economic funds are not distributed equally and not only focused on certain sectors.

Educational results come from several factors: formal education, natural ability, family background and education, and the situation of deprivation, poverty or exclusion. The results of formal education are evidenced in efficiency and equity. Efficiency is the capacity of the education system to promote students entering a level within a given time frame in a higher proportion. Equity is related to the distribution of results, i.e. a poor population is associated with worse results, and therefore with worse income.

When mentioning that the government intends to homologate the knowledge of Ecuadorian students and thus avoid knowledge spillover, different appreciations are presented than those expected. Thus showing an inequality of goals achieved and objectives to be achieved, dispersed in time and even in space. At present, teachers do not focus on the student and what they teach; moreover, the teacher's work has a greater administrative burden, making them not focus on the student.



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The government's objective is to achieve uniform knowledge, but this has not been reflected in Ecuador's high school graduates. It is even more difficult to believe that the high school student in the east of Ecuador has the same needs as the one in the city. The realities of each of them are different, since the needs and opportunities change depending on the place where they are located. As a conclusion in the above-mentioned research, it is intended to capture the environment that encompasses education and particularly the unified general baccalaureate and its contribution to students in their transfer to higher education, determining asymmetry by wanting to add importance in the political and in the programmed making it diffuse and ambivalent affecting this system directly. The states, being immersed in the figure of educational improvements, do not adequately reflect the deconcentrated management model and thus diminishes the value of those involved in it, such as teachers, educational authorities and even the students themselves.

This leads to the conclusion that the proposed educational system does not respond to the exit profiles projected for Ecuador's high school graduates. These statements contributed to make improvements in the curriculum presented in 2016, also showing that it is necessary to take into consideration what one of the directors of the PISA tests emphatically catalogs that are right because the major drawback that Latin America has in education is focused on curriculum reform and are purely by design. Educational reforms should be carried out based on the realities that exist in the country, and not focused on foreign realities.

In education there is much discussion about improvements in both quality and infrastructure, which is why the Information System of Educational Trends in Latin America (SITEAL) in the document extracted from the Base of regulations and policies on the New Ecuadorian High School of the Ministry of Education updated to December 12, 2018, whose objective is the restructuring of curricular reforms designed in 2008 focuses a thorough review on the 2010 reform to improve education in Ecuador with emphasis on the second level of education as is the High School. In the opinion of the research, it is there where concrete reforms should be made, focusing on the student and the needs of society today. Improvements that will be presented when the Ecuadorian citizen finishes high school, and the different ways that must be presented upon graduation. That is to say, the Ecuadorian high school graduate should focus on pursuing a higher education career, but if for other reasons he/she must enroll in the workplace, he/she should be able to do so without any inconvenience.

According to SITEAL 2018, in order to perform the formative, training and propaedeutic functions, the curriculum of the baccalaureate must be well articulated with the labor demands of the different productive sectors, universities and other higher education centers, so that there is no excessive rupture between one and the other. Likewise, it is necessary that the high school graduate interested in entering university is not limited in his or her options as a result, precisely, of a premature and exaggeratedly fragmented specialization, for which it is imperative that his or her training has been sufficiently generic so that no option for higher studies is excluded (p. 10).

The educational system aims to respond to the needs of today's society, and thus remedy the problems that the baccalaureate presents. One of the main drawbacks is the different approaches presented by the curriculum in the educational system, exposing a dispersion in relation to what is proposed; starting from the "competency" approach versus the "content approach". If homologation in education is sought, the approaches should be the same.

The problems externalized in the curricula of 2008, and in the updating and strengthening of the curriculum of March 2010, showed that students in Ecuador faced problems such as



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socioeconomic inequalities, lack of guarantees of equal opportunities, educational dualism, among others, after graduating from high school. There have been countless meetings, debates, congresses, lectures, but to tell the truth the fruits that these have generated have been little fruitful; in the improvements that education should have. These disadvantages are not effects that are concentrated in secondary education, but are dragged to higher education, which is why a new reform is being considered, these would not be unprecedented since there are constant debates in Latin America on education by "generalities" and "specialties".

### 3. Methodology

The following is a general description of the methodology used during the research, for which the research design, population, sample and research techniques and instruments are determined.

#### 3.1 Research design

The research conducted responds to a quantitative study, with a transversal non-experimental design and explanatory scope whose intention was to establish the contribution of the unified general baccalaureate in students, who intended to enter higher education within the Faculty of Philosophy Letters and Educational Sciences of the Career in Pedagogy in Computer Science in the leveling students in the period October 2019-March 2020.

The main variables of the study are described in Table 1 below:

Variable	Dimensión	Indicadores	Ítems
<b>The graduation profile of unified general baccalaureate students</b>	Cognitive area	Logical Reasoning	1.1, 1.2,1.3,1.4,1.5,1.6
		Mathematics	
		Language	
	Procedural area	Social environment	1.7,1.8,1.9
		Natural Science	1.10,1.11,1.12
		Select	1.13,1.20
		Analyze	2.14, 2.15,
	Axiological area Knowing how to be	Complete	2.16,2.17,
		Hierarchize	2.18,2.19,
		Respect	
Solidarity		3.21,3.22,3.23	
Honesty		3.24 3.25, 3.26	
<b>Admission to the pedagogical career in experimental sciences in computer science.</b>	Entry profile to the computer science career.	Investigative	4.27, 4.28,4.29,
		Argumentative	4.30,4.31,4.32
		Responsible	4.33, 4,34,4.35
		Critical	4.36, 4.37
		Logical Reasoning	5.38,5.39
	Knowledge	Language	5.40, 5.41
		N.N.C.	5.42,5.43
		CC SS	5.44, 5.45
		Attempts for university entrance.	6.46,6.47 6.48,6.49
		Exempted tests	6.50, 6.51
Admission policies	Minimum score		
	Placement		



Table 1. Operationalization of the variables studied

### 3.2 Population and sample

The population consisted of 51 students attending the morning and afternoon sessions of the Faculty of Philosophy, Letters and Educational Sciences of the Universidad Central del Ecuador, of whom 60% were male and the remaining 40% female. According to age, 76% were between 20 and 21 years old, and 52% of the students were part of the unified general baccalaureate program.

### 3.3 Research techniques and instruments

For the collection of the data referred to the variables described, a questionnaire survey was used with questions measured on a Likert scale and designed under specific procedures of the discipline under investigation. The instrument consisted of 51 questions, divided by logical, linguistic, scientific and axiological domain constructs, each construct comprising three questions adapted to the Likert scale in a range of 5 to 1 where 5 is the highest range.

The instrument was previously submitted to a reliability analysis for which a pilot test was used with 10 students of the Pedagogy Career in Experimental Sciences of Computer Science, morning section, with similar characteristics to the sample under investigation. The pilot test was used to highlight the errors that were present in the instrument itself, which was carried out with a face-to-face survey; after the pertinent changes were made, it was subsequently applied to the entire population. In this sense, a cronbach's alpha coefficient of internal concordance of 0.831 was obtained for the items, which represents a high reliability.

## 4. Results

Descriptively, the sample is composed of 40% women and 60% men, with 48% in the age group between 20 and 21 years, followed by 28% between 18 and 19 years, and finally 24% of the students between 22 and 23 years of age. In the Pedagogy of Experimental Sciences and Informatics career, 52% of the students have a unified general high school diploma, followed by 44% of the students with a technical high school diploma, and 4% with a bachelor's degree in specialties or other. Of the group surveyed, 26 of the 52 students graduated from secondary school with a unified general baccalaureate, and 22 students obtained a technical baccalaureate. And 4 students obtained another type of baccalaureate. A summary of the results obtained by the dimensions of each of the objective variables is presented below.

Graduation profile of the students of the unified general baccalaureate.

Dimension cognitive domain in reference to the graduation profile of the BGU students in the cognitive domain show deficiencies in logical and mathematical reasoning, since half plus one answered incorrectly and the remaining forty percent were correct, the rest did not answer. Linguistic proficiency in the students is better in half plus one showing adequate skills in the handling of literature. In addition, less than a quarter of the students adequately mastered the subject of social studies. The same that allows showing an average of 48% of correct answers. Given the values, there is evidence of great cognitive weaknesses in the indicators of logical, mathematical, social and natural reasoning in the students participating in the unified general baccalaureate program.

In order to know if the higher skills were acquired by the student, the corresponding process was carried out, which showed that an average of 38% of the students acquired the higher skills. In addition, when the students were asked about the cognitive domain together with the procedural domain, it became evident that less than half of the respondents responded adequately to the questions when these were shown together.



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During this process there is superiority in terms of the elements within the topics covered by the survey, which is why when the cognitive and procedural dimensions were grouped together, the results were less than half but two.

Dimension axiological scope in relation to the axiological determinations in the student in this regard, the respondents agree with the items formulated, in terms of honesty they maintain positions on the scale of agreement and in terms of solidarity, the students surveyed frequently agree very much. It is relevant to mention that the practices within the axiological scope are reflected within the range of good without reaching the level of very good on the perspectives they have in this aspect.

In the investigative area, half but one of the students answered that they investigate autonomously, in addition, a quarter but one investigates when they do not know about a topic, and 34% of the students consider that they are argumentative almost always. The level of responsibility of the student was only 28%, which always shows responsibility according to the expectations of the career. As to whether the student is critical during a class, the informants responded that sometimes they are critical (38%) during a class.

In the Knowledge dimension, the subjects covered within the knowledge dimension were the same as those contained in the cognitive dimension, similar aspects that are measured in the evaluations of the baccalaureate exams. The average of correct answers reached only 10.25%, showing that most of the students surveyed have great weaknesses in terms of the knowledge acquired.

Regarding the dimension Admission policies, the admission policies generate dissatisfaction among the students, because the great majority have tried more than once to reach the required score to opt for admission to higher education and others do not remember the times they have tried. The minimal contribution that the unified general baccalaureate program represents means that all students have to take the leveling semester before going to the first semester of their degree program. In theory, the leveling should be useful for a successful start to the career, however, more than a quarter of the informants believe that the leveling period does not represent adequate help. On average, 40% of the students consider that the exonerating test does not help them to pass the leveling semester since it covers subjects with a high level of complexity. For the general correlation, the graduation profile of the students of the unified general baccalaureate was determined by means of variable one or independent variable; and variable two or dependent variable, the entrance profile.

With respect to the entrance to the Pedagogy Career in Experimental Sciences of Computer Science in function of the graduation profile of the BGU, it was determined that there is a not very significant inverse correlation between the variables with a value of -0.136. This leads to the acceptance of hypothesis two, which falls into the null hypothesis (H0) The graduation profile of the students of the unified general baccalaureate does not provide sufficient bases to enter higher education. In addition to the general correlation, the dimensions of the operationalization of the procedural variables were analyzed with the entry profile to determine if there is a relationship with the indicators. Accordingly, the correlation coefficient between the entry profile of the computer science pedagogy career in the procedural area and the graduation profile of the students of the unified general baccalaureate was 0.986. Evidencing a high level of correlation affirming the needs of higher education in terms of the procedural area of the baccalaureate, on the skills that should be presented and their ability to select, analyze, and even hierarchize; skills acquired by the student during his passage through high school, are high and constitute an advantage for the entrance to the career.





This result proves that what is acceptable in the BGU are the relationships that exist between Pre-entry and the procedural area, accepting the hypothesis that the skills acquired in the unified general baccalaureate are not elementary, and contribute to the profile for entry into higher education.

## 5. Conclusions

The research essentially sought to determine the relationship between the graduation profile of the unified general baccalaureate and the entrance profile to the computer science career, which had as its main population the students in the first semester of the career.

In relation to the specific objective one, which sought to diagnose the skills acquired by the students during the BGU, it was determined that 52% of the students have deficiencies in the cognitive area such as logical reasoning, mathematics, social studies and natural sciences. It is necessary to mention that the only strength was evidenced in the area of linguistic domain with 60% of assertiveness.

This contrasts with Tamayo (2019) in his research called "Educational System of Ecuador: one system, two worlds" where he mentions that if the tests were complicated in 2008 when 4 out of 10 students failed the entrance tests(..) "This was further aggravated with the change of the tests from abstract, numerical and verbal reasoning of the first application of the exam in 2012 (SENESCYT, 2015) to its current version as a knowledge exam.

In relation to specific objective two to determine the relationship between skills of the higher education entrance profile and the graduation profile of the unified general baccalaureate that allows access to university. It was concluded that the skills developed during the BGU barely reach the level of criticality that is required, the low level of responsibility and argumentativeness is also evident, i.e. the expectations of the entry profile are high and the skills developed are low.

In comparison with Ortiz (2017), during their research: "Experiences in the Central University of Ecuador" (p. 50) determined that, in the FJCPS, the ability to think in critical mode had as results 44%, 44%, and 44% during three periods. In FAU, the ability to think critically had as results 33%, 50%, and 58% in the three periods it is important to mention that the results shown are results obtained in different faculties, obtained in the leveling course from 2012 to 2015. (p. 48).

In relation to the specific objective three, to establish the level of knowledge that students have in the subjects of the common core to enter the Pedagogy in Computer Science career. It was found that the level of knowledge in the areas of logical reasoning, mathematics, language, social studies and natural sciences is low. In relation to the high expectations that the Ministry of Education stated would be reached with the incorporation of the unified general baccalaureate to the educational system, it was found that the level of knowledge in the areas of logical reasoning, mathematics, language, social studies and natural sciences is low.

Regarding the research of the aforementioned authors on establishing the level of knowledge possessed by the students. In the subjects of the common core for the entrance to the career it is evidenced that logical reasoning is not a subject adequately achieved. and others that were presented within the research that concludes that it should be reinforced in the development of thinking and logical reasoning, in certain faculties of the studied oral and written skills in addition to verbal reasoning. There is also evidence of high percentages of correct answers in certain periods and low percentages in others.



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Revista Cátedra, 5(1), pp. 114-124, January-June 2022. e-ISSN: 2631-2875

<https://doi.org/10.29166/catedra.v5i1.3428>

## Bibliography

- Instituto de Evaluación Educativa. (2019). Informe de resultados nacional. <http://www.evaluacion.gob.ec/evaluaciones/investigaciones-ser-bachiller/>.
- Ministerio de Educación del Ecuador. (0 de 0 de 2019). Currículo de los niveles de educación obligatoria. Recuperado el 21 de 3 de 2021, de Ministerio de Educación Currículo: <https://educacion.gob.ec/curriculo/>.
- Santana, C. I. (04 de 01 de 2016). La reforma del Bachillerato en el Ecuador entre 2007-2014: caso de la Unidad Educativa Fiscal 13 de octubre de Calceta-Manabí. Recuperado el 24 de 06 de 2019.
- Ortiz Herrera, J. D., Buitron Aguas, L. H., & Yupanguí Carrillo, Y. de las M. (2017). Nivelación propuesta por la SENESCYT: Vivencias en la Universidad Central del Ecuador. *INNOVA Research Journal*, 2(10.1), 42-53. <https://doi.org/10.33890/innova.v2.n10.1.2017.491>
- Bachillerato General Unificado. (s. f.). Ministerio de Educación. Recuperado 10 de febrero de 2021, de <https://educacion.gob.ec/bachillerato-general-unificado/>
- Instituto Nacional de Evaluación Educativa. (10 de 06 de 2013). Resultados Educativos INEVAL. Recuperado el 22 de 03 de 2020, de <https://www.evaluacion.gob.ec/ineval-presento-resultados-educativos-2/>
- Reglamento general a la ley orgánica de educación intercultural, 116 (2012). <https://educacion.gob.ec/wp-content/uploads/downloads/2017/02/Reglamento-General-a-la-Ley-OrgAnica-de-Educacion-Intercultural.pdf>
- Santana Cobo, M. C. (2015). Análisis de las fallas de implementación de la política de educación para bachillerato en Ecuador, a partir de la reforma educativa de 2011 [Facultad Latinoamericana de Ciencias Sociales-Flacso Ecuador]. <http://hdl.handle.net/10469/13597>
- Madrid-Tamayo, T. (2019). El sistema educativo de Ecuador: un sistema, dos mundos. *Revista Andina de Educación*, 2(1), 8-17. <https://doi.org/10.32719/26312816.2019.2.1.2>
- Rosero, M. (2020, enero 26). Lorena Araujo: 'La "U" debe reflexionar sobre qué necesita el país' | El Comercio. *El Comercio*, 2. <https://www.elcomercio.com/actualidad/lorena-araujo-universidad-educacion-bachiller.html>.

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Revista Cátedra, 5(1), pp. 114-124, January-June 2022. e-ISSN: 2631-2875

<https://doi.org/10.29166/catedra.v5i1.3428>

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