Análisis e implementación de la educación gratuita en la Universidad de Atacama

Analysis and implementation of free education at the University of Atacama

Carmen Gloria Burgos-Videla.
Universidad de Atacama (Chile).
carmen.burgos@uda.cl

Ana Oña Macías.
University of Lucerne (Suiza).
analucia.onamacias@paraplegie.ch

Wilson Castillo Rojas.
University of Atacama (Chile).
wilson.castillo@uda.cl

RESUMEN.
Basado en la realidad Chilena sobre política de educación gratuita (2016), el artículo presenta un estudio que aborda la recepción sostenida por las instituciones de educación superior con respecto a mecanismos de aplicación y control de la política; tomando como muestra al grupo de estudiantes de la Universidad de Atacama con el beneficio en el año 2018. El análisis cuantitativo de los datos se realiza considerando las facultades y carreras, la vía de ingreso de los estudiantes, el tipo de establecimiento de origen y los académicos. factores de entrada Se concluye que sin mecanismos de evaluación y monitoreo, este beneficio podría convertirse en una partida del presupuesto de educación superior sin resultados fructíferos para el país. Con respecto al resultado, se establece que en la muestra analizada, los estudiantes que ingresan por vía regular o Prueba de Selección Universitaria (PSU), el rango de puntaje obtenido en los Grados de la Escuela Secundaria (NEM), es más bajo que los puntajes de PSU y Clasificación, por lo que no influye significativamente como factor de ingreso académico, esto significa que para un estudiante con el beneficio de gratuidad prevalece el puntaje PSU.

PALABRAS CLAVE.
Educación superior, gratuidad en educación superior en Chile, análisis de datos.

ABSTRACT.
Based on the Chilean reality about the Free Education Policy (2016), the article presents a study that addresses the reception sustained by higher education institutions regarding the mechanisms of application and control of the policy; taking as a sample the group of students at the University of Atacama with the benefit in the year 2018. The quantitative data analysis is carried out considering the faculties and careers, the route of entry of the students, type of establishment of origin, and academic's entry factors. It is concluded that without evaluation and monitoring mechanisms this benefit could become an item of the higher education budget without fruitful results for the country. Regarding the result, it is established that in the sample

Fecha de recepción: 22-04-2020 Fecha de aceptación: 05-05-2020
Burgos-Videla, C. G., Oña, A. & Castillo, W. (2020). Análisis e implementación de la educación gratuita en la universidad de Atacama.
International Journal of Educational Research and Innovation (IJERI), 14, 1-16.
ISSN: 2386-4303. DOI https://doi.org/10.46661/ijeri.4483

analyzed, students who enter by regular route or University Selection Test (PSU), the score range obtained in High School Grades (NEM), is lower than the PSU and Ranking scores, so it does not influence significantly as an academic income factor, this means that for a student with the benefit prevails the PSU score.

KEY WORDS.
Higher education, Chilean free higher education, data analysis.

1. Introduction.

Education is essential for the development of services in any country, which is key to increasing productivity (Romer, 1986), and the possibility of social mobility. Considering that education is a right and that it is also related to the growth and advancement of society in the socio-economic aspect, the view on changes in the educational system must be multidimensional, that is, considering at least a variety of elements that affect those changes. In that understanding, the change of focus in the management of education with the determination of curricula, as subjects who participate or are challenged by socio-political and cultural problems is reflected in the evolution of proposals in education. The aforementioned impacts on the processes that attend tertiary education (Senthilkumar y Arulraj, 2011), because at this level it is expected to achieve human capital formation and there by improve the productive and competitive conditions of the country (Barrientos y Araya, 2018).

With regard to the above, it is plausible to accept that access to higher education is a global problem, and also to understand that the problem acquires greater emphasis on developing countries. A situation that is evidenced in higher international reports when they express that infants who come from households with more unfavorable economic and social conditions are less likely to have access to education, especially higher education and almost null chances of completing these studies (OECD, 2018).

The objective of this research is to provide a first analysis of the implementation of the Free Education System in the University of Atacama (From now on, UDA), through the study of the profile of students with the free education benefit and their academic performance. In addition, based on the literature review and the actual implementation mechanisms, to detect possible threats and weaknesses of this social benefit for universities in the short and long-term.

In the first section, the higher education system in Chile is described, emphasizing in a nodal aspect: the free education system, addressing the normative elements implied in it and its implementation at the UDA. In the second section, according to the information collected since 2018, the profile of the student entering the UDA with this benefit, and how they have been responding academically so far. In the final part, the conclusions are detailed based on the revised information and the lines of discussion about this theme are raised.

2. Free Higher Education in Chile in a global context.

The analysis of the free education system and the characteristics of higher education isn't only relevant for Chile, because the logic and governmental dynamics sustained in the Latin American region are similar, a growing increase in the educational offer in the 90s and a decrease in access and equality for sustained diversification (García-Guadilla, 2007). Free

Fecha de recepción: 22-04-2020 Fecha de aceptación: 05-05-2020
Burgos-Videla, C. G., Oña, A. & Castillo, W. (2020). Análisis e implementación de la educación gratuita en la universidad de Atacama.
International Journal of Educational Research and Innovation (IJERI), 14, 1-16.
ISSN: 2386-4303. DOI https://doi.org/10.46661/ijeri.4483

education should be analyzed in the context of a conception of education as a public good mechanism for promoting equity and social mobility (Espinoza y González, 2016).

If we consider the economic development of a country, one of the variables with the highest incidence becomes university education; studies show that a country with greater access to education has a better quality of life (Pacheco, L. y Pacheco, R., 2015).

The percentage of expenditure on educational institutions regarding the Gross Domestic Product (GDP) of the OECD countries is approximately 5%. Chile is above this value reaching 6%, of which more than 60% goes to primary and secondary education (Ministry of Education, 2018; OECD, 2018).

Chile shows good results compared to education expenses, enrollment rates and per capita expenses compared to OECD countries. According to Urzúa and Espinoza (2014), these Chilean advances are largely due to private investment, but this hasn't been able to solve the underlying problem: structure of financing of higher education and the differences that exist in quality.

In the study conducted by Espinoza and Urzúa (2015), the Chilean education system is described, mentioning that in an international context Chile is ranked among the first in terms of coverage in higher education. Namely, Chile with 74% is above the average of Latin American countries with 43%. It is considered that coverage in higher education for Chile is considered within the nations with the highest levels. Considering the access, Chile is in the international trend, with the tuition fees compared with Austria, Holland, Ireland, Sweden, and Norway. This result is quite dizzying, while in Norway, for instance, the process lasted about 50 years, while in Chile the same advances were achieved in two decades.

The increase in the enrollment rate is surprising, in 15 years it grew from 30% to 75%, while Norway achieved it in 30 years, a similar issue occurs with Sweden. Another issue that attracts attention is that Chile is above France in terms of coverage, knowing that France's educational quality and per capita income exceeds that of Chile.

These examples account for the difference in development models, however, we return to this because we try to implement similar educational policies regarding free education. The issue that stresses the implementation of models because it dismisses real needs, national and regional issues.

Similar to the aforementioned issue occurs in Latin America, where there are leading universities that compete with the best in the world; we find some universities in Mexico, Brazil, Chile, Colombia, Peru or Argentina. The problem lies in the difference of a public/private model, in the price that must be paid to qualify for quality education, for that matter we can contrast the case of Argentina and Mexico, where education is almost free for students.

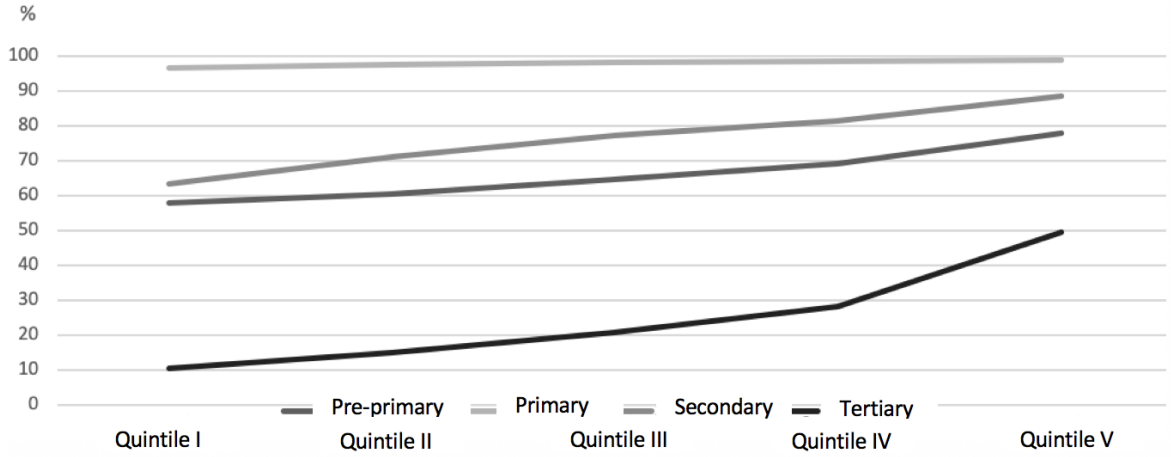
One of the problems that arise when executing public policies is that they often disconnect the basic principles of human rights. In the case of higher education: universality, non-discrimination, and free education. If education is treated as a commercial good, the ability to pay for access is prioritized. In this way, education becomes a benefit only for families that have the capacity to pay and it's not constituted as a universal right (Pérez, 2007).

Despite the increase in access to education, in Figure 1, it can be seen that access to education is very unequal in the region. Access to primary education doesn't show major differences between income quintiles; however, at the pre-primary, secondary and tertiary

Fecha de recepción: 22-04-2020 Fecha de aceptación: 05-05-2020
Burgos-Videla, C. G., Oña, A. & Castillo, W. (2020). Análisis e implementación de la educación gratuita en la universidad de Atacama.
International Journal of Educational Research and Innovation (IJERI), 14, 1-16.
ISSN: 2386-4303. DOI https://doi.org/10.46661/ijeri.4483

levels, this difference is accentuated as people's income increases. Access to education shows a growing direct relationship according to the purchasing power. That is, households with lower incomes have lower university entrance rates than households with higher incomes.

Figure 1. Enrollment by education levels and income quintiles in Latin America and the Caribbean.



Source and elaboration: OECD / CAF / ECLAC, based on CEDLAS and World Bank 2016. The Latin American and Caribbean average includes: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, and Uruguay.

One of the edges that touch the point of free education has to do with the fact that universities in Latin America are linked to productive and administrative sectors, moving to a complex outsourcing system that increases the percentage of their own financing, this gives us of the social responsibility that the university and the educational offer fulfill.

3. Free Education in Chile.

Chile in recent decades has improved the quality of life of its inhabitants; however, this improvement is challenged by the high inequality and stagnant productivity it presents. Improving the quality of education becomes an important factor to reduce these problems (OECD, 2018). Prior to the 1981 reform, resources in Chile were mainly financed by fiscal resources. After this reform, the financing is given by Direct Fiscal Contribution (ADF), Indirect Fiscal Contribution (AFI) and a National Fund for Scientific and Technological Development (FONDECYT) (Muñoz, 2018). The Chilean higher education model and its financing despite having some changes, are mainly based on the Constitutional Organic Law of Education (LOCE) and the 1981 Constitution (Marcel y Tockman, 2005).

With regard to financing options to access higher education, the following options are available: (i) free access, (ii) scholarships, (iii) loans and (iv) own funds (Muñoz, 2018).

Prior to the application of the free education system in Chile, there were many analyzes of the relevance of this reform. Urzúa and Espinoza (2014) make an analysis from the motivation of free access to education, and state that free education is the wrong answer to educational problems in Chile, the same ones that are: heterogeneity in the educational offer in terms of

Fecha de recepción: 22-04-2020 Fecha de aceptación: 05-05-2020
Burgos-Videla, C. G., Oña, A. & Castillo, W. (2020). Análisis e implementación de la educación gratuita en la universidad de Atacama.
International Journal of Educational Research and Innovation (IJERI), 14, 1-16.
ISSN: 2386-4303. DOI https://doi.org/10.46661/ijeri.4483

quality and access to it. In this way, free access is an alternative to meet the immediate demand of certain groups but having no measures to counteract the problem of educational quality, free education will only represent a cost for Chile.

Barrientos and Araya's study (2019) makes it clear that one of the important issues to analyze regarding the free education issue is the State Aval Credit (SAC) as a policy that began to be implemented in 2006, and points to the massification of higher education in Chile. This is to tender from the banks a client portfolio for the loan. Thus, leaving the responsibility to the student, the State, and the Institution. The percentage of responsibility varies according to the student's situation: dropout, graduation, among others.

Free education in Chile began with Law No. 20.882 on the Public Sector Budget in 2016, it was modified through Law No. 20.890 and began to operate in 2016. (Brunner y Labraña, 2018). For the year 2016, of the MM$1,852,287 Chilean pesos that were destined for higher education, 21.3% went to the free education system (General Comptroller of the Republic, 2017).

Within the general characteristics of the free education system are[1]:

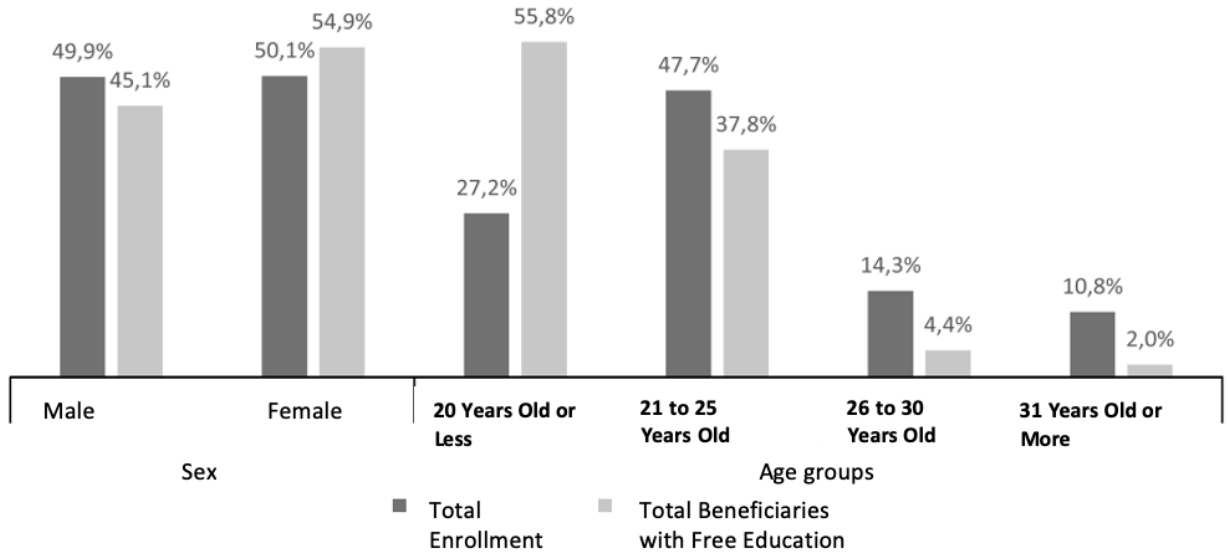
- Students who acquire this benefit must not pay a fee or tuition at their institution.
- The benefit is credited for the formal duration of the program.
- It benefits higher education students from households belonging to sixty percent of the population's lowest-income who are enrolled in one of the institutions attached to the benefit.
- The student must not have a professional degree or have exceeded the formal duration of the program.
- The suspension of this benefit and the change of program is allowed for a single opportunity.
- The benefit can be used in universities and technological institutes that are attached to it.
- If a student pursues a technical degree or has a higher-level technical degree, he or she has access to free education only if they enroll in a program leading to a professional degree with or without a degree.
- Beginning in 2019, if students aren't candidates for the benefit, they can access a fee payment adjusted according to the socio-economic situation of the student.

In the first year of execution of the system, a total of 138,951 students accessed high education for free. This state investment reached MM$395,194 Chilean pesos. Regarding the distribution of these students, 50.8% of the first-year students accessed this benefit. The regions with the highest concentration of students with the benefit were: Metropolitan Region (30.7%), Biobío Region (17.2%) and Valparaíso Region (13.6%). Among these three regions, more than 60% of students are concentrated on this benefit. The number of students with the benefit in the Atacama region, in the national total, is only 1.6% in 2016; however, considering the number of students in the region, this figure is significant (General Comptroller of the Republic, 2017).

Fecha de recepción: 22-04-2020 Fecha de aceptación: 05-05-2020
Burgos-Videla, C. G., Oña, A. & Castillo, W. (2020). Análisis e implementación de la educación gratuita en la universidad de Atacama.
International Journal of Educational Research and Innovation (IJERI), 14, 1-16.
ISSN: 2386-4303. DOI https://doi.org/10.46661/ijeri.4483

In Figure 2, the distribution of students with the benefit for the year 2016 can be seen according to their age and sex. It is evident that approximately half of the students who entered that year to study used this benefit, the percentage being higher in women (54.9%) than in men (45.1%). With regard to the age group, the highest concentration occurs in students 20 years old or younger (55.8%), followed by the students between 21 and 25 years old (37.8%).

Figure 2. Distribution of those enrolled for free, according to sex and age, 2016.



Source and Preparation: 2016 Annual Report of Student Benefits, Ministry of Education (2016).

After 3 years of operation of this law, problems have been detected in the application that put at risk the sustainability of this social benefit. A clear example is the number of students who lost the benefit at the beginning of 2019.

From the studies of Urzúa and Espinoza (2014), it is shown that the cost of free education by having a financing structure with greater participation of the private sector was going to become a high item for the Chilean State. In addition, the high levels of tariffs that exist in both public and private universities could have negative effects on the finances of higher education institutions. As there are no changes in this base structure, the financing that higher education institutions are receiving doesn't represent the item of fees in each of the programs of the different universities assigned to this benefit. For this reason, a deficit is created that must be addressed by each university. Moreover, the problem of the loss of the benefit, despite the fact that the parties are clear, has repercussions not only on the situation of the student who no longer has the resources to finish their studies; but in the figures of desertion and timely qualification with which the universities are measured.

Scholarships, on the other hand, support students financially partially or totally so that they can study, and in some cases, they cover the tuition fees. There are some scholarships, but the biggest difference with free education is that they require a co-responsibility of students either in academic performance or in-class attendance.

Fecha de recepción: 22-04-2020 Fecha de aceptación: 05-05-2020
Burgos-Videla, C. G., Oña, A. & Castillo, W. (2020). Análisis e implementación de la educación gratuita en la universidad de Atacama.
International Journal of Educational Research and Innovation (IJERI), 14, 1-16.
ISSN: 2386-4303. DOI https://doi.org/10.46661/ijeri.4483

Credits are loans that are made to the student to cover part of the costs of the studies. There are two loan options: SAC and the University Credit Solidarity Fund. The biggest difference between free education, scholarships, and loans, is that in the latter the students at the end of their studies have the obligation to pay these loans, generating a financial disadvantage compared to those who don't have to pay these amounts (Muñoz, 2018).

The Chilean Budget Law of 2019 considers an increase of 8.2% in the benefits of Free Education, scholarships and the University Credit Solidarity Fund. This increase seeks to reach a coverage of 232 thousand students that have free access to study in the affiliated universities using $46.369 million Chilean pesos. It should be noted that the benefit also extends to students who enroll in Technical Training Centers and Professional Institutes. The budget allocated for this reaches $44.563 million Chilean pesos, seeking to cover approximately 182 thousand students. The tentative number of beneficiaries with the scholarships amounts to 208 thousand students (Budget Directorate Government of Chile, 2019).

For the year 2019, according to the information of the Ministry of Education[2] without considering the students who renew their benefits, 93.654 students were benefited from free education, 57.913 students counted with scholarships, and the solidarity fund benefited 4.674 students. Of all the students who received the free education benefit, 94% corresponds to freshmen.

Brunner and Labraña (2018) analyze the financing of higher education in Chile and conclude that there is important heterogeneity in terms of tax expenditures per student in Chilean universities. Furthermore, the differences between scholarships, loans, and free education create greater gaps between the initial and final conditions of the students benefited from each of these items. If there are no solutions that balance the quality and prices of higher education, greater dependence of universities on state spending and its policies will be generated, leaving aside the private financing that Chilean education has historically had, affecting quality and equity.

4. Analysis of Free Education in the UDA.

The UDA is a public higher education institution located in northern Chile. At present, it has approximately six thousand students, eight academic units and offers both undergraduate and postgraduate programs[3]. Like the rest of the Chilean institutions, the UDA since 2016 opened the free education financing modality. To date, there are 4.622[4] students who possess this benefit.

Table 1 shows how the number of beneficiaries has increased; it is important to note that access to this benefit isn't limited to first-year students. In this way, students who are already pursuing their degree can access the benefit and once they obtain it, the rest of the years are renewed while they meet the requirements to maintain it. In just 3 years since the creation of the benefit, the number of students who possess it has doubled.

Fecha de recepción: 22-04-2020 Fecha de aceptación: 05-05-2020
Burgos-Videla, C. G., Oña, A. & Castillo, W. (2020). Análisis e implementación de la educación gratuita en la universidad de Atacama.
International Journal of Educational Research and Innovation (IJERI), 14, 1-16.
ISSN: 2386-4303. DOI https://doi.org/10.46661/ijeri.4483

Table 1. Distribution of Free Education in the UDA.

Year	New Freshmen Students	New Students from Other Semesters	Renewing Students	Total
2016	921	1.345		2.266
2017	996	269	1.815	3.080
2018	1.171	266	2.396	2.833
2019	946	18	3.658	4.622

Source: UDA Student Welfare Unit.

According to the information provided by the Student Welfare Unit of the UDA, for the year 2019, of the total number of students enrolled, students with the benefit represent 70%[5]. The database that will be used for the analysis corresponds only to the students from diurnal programs (5.051). Of this group, the average age of students who don't possess the benefit is 22,21 years old, and of students who possess the benefit is 21,9 years old. There is no evidence that they have a significant difference, but it is important to point out two relevant aspects: the first is that the average age of admission in the year 2019 was 20 years old for students without the benefit (men) and 19,7 years for students who possess the benefit (men). In the case of women, the average age of admission for the year 2019 is 20 years old for both groups. This figure gives an important indication of the student situation at the university. Students begin their studies with an age above the expected age of 18 years, which is the age at which most students finish their high school studies.

Although the objective of this research is to link the academic performance of the students with the benefit, the information presents limitations. The main limitation lies in the access to information, the university doesn't have a centralized place with easy access to obtain all the information of students (academic aspects and social benefits). This is a weakness in which the university is working, but it generated delays and problems in the global use of data as stipulated. It was solved considering the information that is delivered by unified enrollment every year; nonetheless, given that the students of the UDA have the option of eliminating a course only once, the average per semester given per student does not necessarily serve as a direct comparison. In this way, another indicator is proposed to capture this information considering the number of credits of the course, the opportunity in which the course was approved and the number of courses[6].

In Table 2, relevant aspects of the students with the benefit versus the students without it are shown by the academic level. Although not at all levels, in the vast majority it is visualized that the average of the courses enrolled as the average of the approved courses is better for students who don't possess the benefit versus those who have it. If the average is analyzed directly, it is possible that students with the benefit present better grades than students without it, but it is a situation that will be explained in the following graphs. When analyzing historically approved courses, it can be seen that students with free education progress slower in programs than students without the benefit. Another relevant point to show is that in academic level 1, students who entered their program in the year 2019 are registered, in this way they wouldn't have to have approved courses unless they come from other programs. For both men and women, it is clear that many of the students with the benefit are using this resource,

Fecha de recepción: 22-04-2020 Fecha de aceptación: 05-05-2020
Burgos-Videla, C. G., Oña, A. & Castillo, W. (2020). Análisis e implementación de la educación gratuita en la universidad de Atacama.
International Journal of Educational Research and Innovation (IJERI), 14, 1-16.
ISSN: 2386-4303. DOI https://doi.org/10.46661/ijeri.4483

and although some courses are validated, the program change already has a consumption of years of the benefit. Although there are more men than women enrolled in the UDA, the gap between students with the benefit and those without it in courses enrolled and approved is greater for men than for women at higher levels.

Table 2. Characterization of the UDA students enrolled in 2019
Note: Source: UDA Student Welfare Unit.

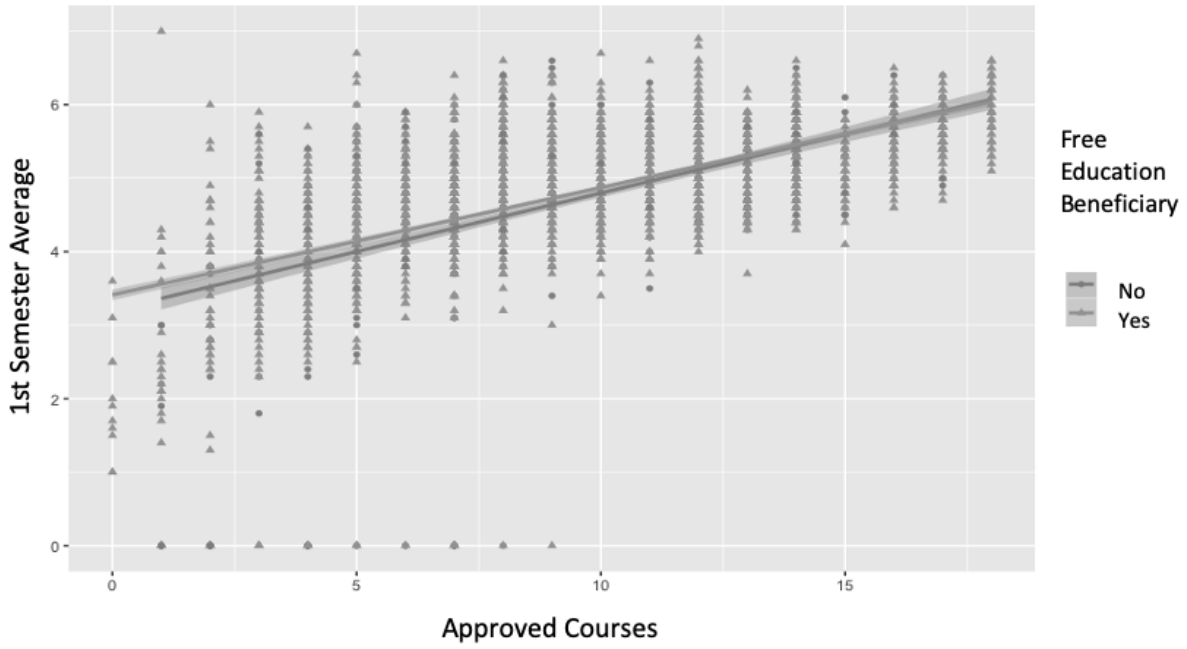
Academic Level	Average of Enrolled Courses				Average Approved Courses				Number of Students			
	Men		Women		Men		Women		Men		Women	
	Without Free Education Benefit	With Free Education Benefit	Without Free Education Benefit	With Free Education Benefit	Without Free Education Benefit	With Free Education Benefit	Without Free Education Benefit	With Free Education Benefit	Without Free Education Benefit	With Free Education Benefit	Without Free Education Benefit	With Free Education Benefit
1	1,4	3,4	0,6	4,0	1,0	2,3	0,5	2,9	383	538	313	635
2	13,1	13,2	16,8	14,4	11,2	10,8	13,8	11,6	30	200	21	250
3	18,4	16,9	20,6	18,2	16,3	15,4	18,4	16,7	78	278	70	405
4	25,9	24,5	28,7	28,2	22,9	21,7	25,3	25,5	42	93	41	180
5	32,7	30,9	33,8	31,8	28,8	28,3	31,0	29,6	58	154	94	272
6	40,3	38,5	44,0	41,1	36,2	33,3	39,0	37,7	18	51	21	49
7	47,5	46,3	46,8	43,4	42,4	42,0	43,4	40,5	45	63	47	108
8	47,9	51,3	51,9	51,9	44,3	45,9	46,5	47,9	16	32	27	41
9	54,0	57,8	55,6	55,6	51,0	53,7	52,6	52,6	37	58	42	77
10	67,6	61,7	60,4	61,7	59,4	57,3	56,2	57,7	17	24	17	28
11	66,9	65,3	68,8	66,5	61,6	61,1	61,8	62,3	28	22	6	12
12	71,4	68,5	71,7	70,0	65,0	64,6	67,3	66,0	8	11	7	4
Total									760	1.524	706	2.061

In Figures 3a and 3b, it is possible to visualize how the average obtained by the students with the benefit and without it relates to the approved courses separated by semesters. Both figures show that as students approve more courses, the dispersion of the data is lower and is above a 4 (which is the passing grade). Students who have less than 10 courses approved, both with free education and without it, have a very low-grade point average. If only Figure 3a is analyzed, which corresponds to the average of the courses taken in the first semester of 2018, it could be said that students with the benefit have a better average than students who don't possess it. This statement must be handled with care because of the particularity of the elimination of courses in the UDA. This option available to students only once per course is the variable that causes these results. To counteract this situation, Figure 3b is analyzed in

Fecha de recepción: 22-04-2020 Fecha de aceptación: 05-05-2020
Burgos-Videla, C. G., Oña, A. & Castillo, W. (2020). Análisis e implementación de la educación gratuita en la universidad de Atacama.
International Journal of Educational Research and Innovation (IJERI), 14, 1-16.
ISSN: 2386-4303. DOI https://doi.org/10.46661/ijeri.4483

which the same comparison is made, but with the marks obtained in the second semester. In this graph, the differences between students with the benefit and without it stand out more. In the second semester, since they have already taken up the resource for the elimination of the courses and cannot reoccupy it, the academic performance of the students with free education measured through the average is lower than that of the students without the benefit and is maintained until approximately the students with 12 approved courses. These two figures indicate the behavior of students who possess the benefit: career changes, poor performance in the first semesters and a tendency to eliminate courses that they will not approve.

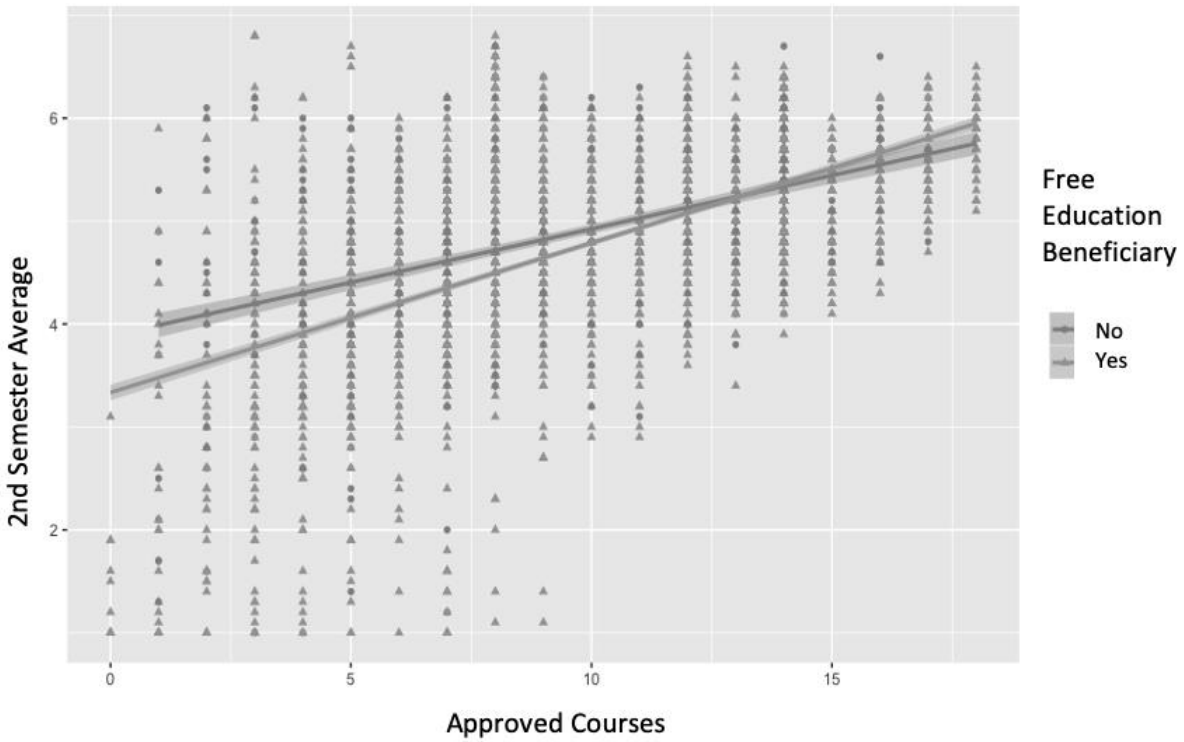
Figure 3a. Relationship between approved courses and academic performance for students with free education benefits. First semester of 2018.



Source: UDA Student Welfare Unit.

Figure 3b. Relationship between approved courses and academic performance for students with free education benefit. Second semester of 2018.

Fecha de recepción: 22-04-2020 Fecha de aceptación: 05-05-2020
Burgos-Videla, C. G., Oña, A. & Castillo, W. (2020). Análisis e implementación de la educación gratuita en la universidad de Atacama.
International Journal of Educational Research and Innovation (IJERI), 14, 1-16.
ISSN: 2386-4303. DOI https://doi.org/10.46661/ijeri.4483



Source: UDA Student Welfare Unit.

Then, an in-depth study of the data is carried out focusing on the year 2018, since this period has the necessary and complete information for this analysis process. The analysis consists in describing the distribution of the benefit of free education by faculties and programs, in addition to visualizing some aspects of entry such as type of school (Municipal or Private and / or subsidized), and entrance route (regular or PSU, and special admission). It should be noted that the UDA has seven faculties, and one headquarters that for the purpose of this analysis is considered as another faculty, these are: Health Sciences, Engineering, Humanities, and Education, Legal and Social Sciences, Technological Faculty, Natural Sciences, Medical Faculty, and Headquarters of Vallenar. It should be noted that the Faculty of Natural Sciences has no programs and only provides teaching service to the other faculties, so it does not have its own students.

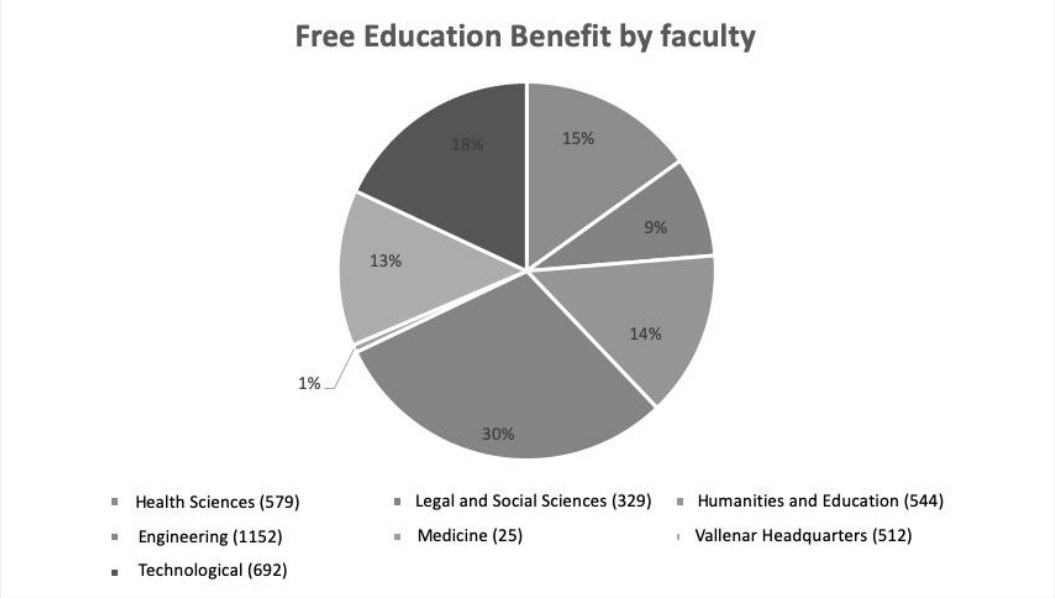
Figure 4 shows that the greatest amount (30%) of the assigned benefits are given in the Faculty of Engineering, which is also the one with the highest number of programs offered. It is worth noting in this graph, that the amount of the benefit provided for the medical program isn't notable regarding those of other faculties, because it is a new faculty that was created only two years ago.

Even many of the programs did not provide initial free education benefits in 2018, such as Law, Mining Execution Engineering, Bachelor of Education in English, and some technical careers. The highest values of renewal were found in careers such as Nursing, Geology, Mining Civil Engineering, and Obstetrics. Considering the different ways of admissions, special admission is higher in the technical programs. These programs belong mainly to the

Fecha de recepción: 22-04-2020 Fecha de aceptación: 05-05-2020
Burgos-Videla, C. G., Oña, A. & Castillo, W. (2020). Análisis e implementación de la educación gratuita en la universidad de Atacama.
International Journal of Educational Research and Innovation (IJERI), 14, 1-16.
ISSN: 2386-4303. DOI https://doi.org/10.46661/ijeri.4483

Technological Faculty or to the Vallenar Headquarters. It can also be observed that the largest number of students with the benefit who enroll via PSU or regular admission, is distributed in programs of the Faculty of Engineering and Health Sciences. The origin of the students' schools is independent of the programs and faculties.

Figure 4. Free education benefit allocation in 2018 by faculties in the UDA.



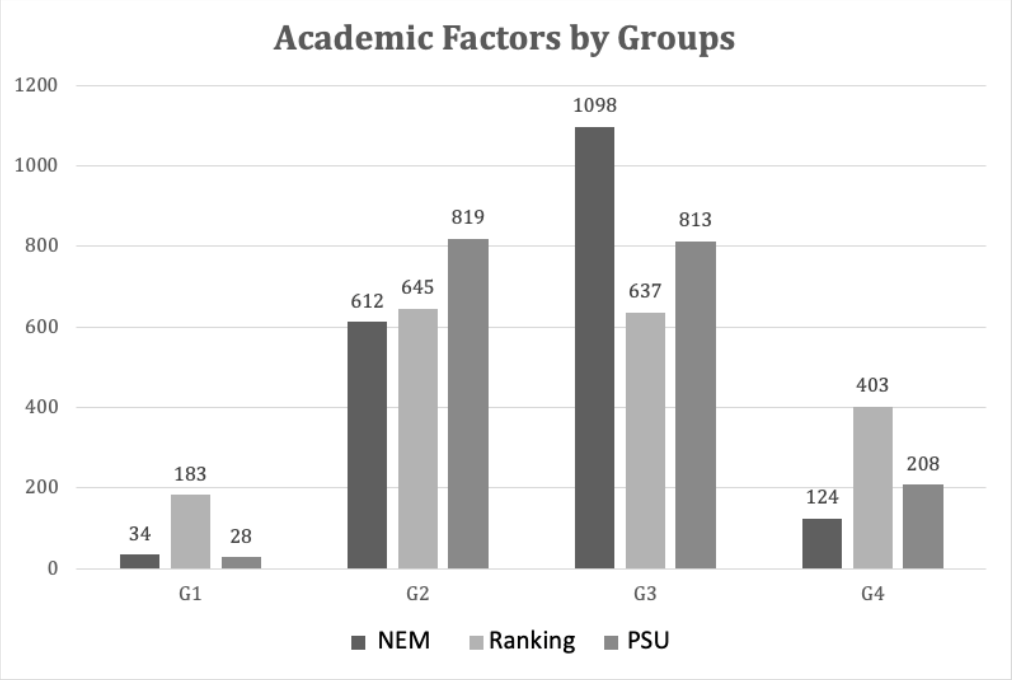
Subsequently, once the initial exploratory analysis was performed, we proceeded to analyze whether there is any relationship with the information of the variables. For this analysis, the information in the previous analysis was taken into account, as well as the rest of the attributes of the database and it was shown that students who received the renewal of the benefit lacked the information of their deciles, while those who received initial free education did not.
Something similar happens with students who enter via special admission, which do not contain information regarding the grades acquired in the PSU, and the trajectory of secondary education; instead, those who enter by regular means do provide this information. This led to filtering the data according to the aforementioned conditions and the analysis was deepened only for students with regular or PSU admission.
The academic factors are not attributes provided by the original data but are the result of a transformation of data referring to the PSU grades, and the scores corresponding to secondary education such as the NEM score and the Ranking. For this, each attribute was divided into 4 groups according to the score as listed below:

- G1: 300 – 449 (Bad)
- G2: 450 – 549 (Regular)
- G3: 550 – 650 (Good)
- G4: 650 -> (Excellent)

Fecha de recepción: 22-04-2020 Fecha de aceptación: 05-05-2020
Burgos-Videla, C. G., Oña, A. & Castillo, W. (2020). Análisis e implementación de la educación gratuita en la universidad de Atacama.
International Journal of Educational Research and Innovation (IJERI), 14, 1-16.
ISSN: 2386-4303. DOI https://doi.org/10.46661/ijeri.4483

Figure 5 shows details of each of these groups, and it is observed how the largest number of students present their parameters between 450 and 650 points which defines them in the middle ranges (G2 and G3). It can also be estimated that there is a high probability that the parameters of the students share the same group or are in neighboring groups. For instance, if a student's NEM score is in G3, it is very likely that the rest of the parameters are also in the same group or in G2 or G4. This can help classify the student's profile.

Figure 5. Academic Factors of Students Entering Via Regular Admission Grouped by Ranks.



It can be concluded from this figure, the distribution of academic factors, and where it is emphasized that the range of NEM scores is lower than that of other factors, regardless of whether the averages and medians are close.

5. Discussion.

Free education constitutes the social benefit that allows mitigating the inequity of access to higher education; nonetheless, this document wants to open the discussion about academic co-responsibility and political, social and economic aspects that can accentuate these inequities. An example of this situation is the difference between scholarships and free education benefits. While scholarships require compliance with attendance percentage, grade levels, and renewal based on compliance with these requirements; with the free education benefit, it is only necessary to obtain it once and it will last the period that the entered program lasts. It could generate a disincentive to apply for scholarships and seek the benefit of free education, that in reality is a scholarship that has fewer responsibilities.

Fecha de recepción: 22-04-2020 Fecha de aceptación: 05-05-2020
Burgos-Videla, C. G., Oña, A. & Castillo, W. (2020). Análisis e implementación de la educación gratuita en la universidad de Atacama.
International Journal of Educational Research and Innovation (IJERI), 14, 1-16.
ISSN: 2386-4303. DOI https://doi.org/10.46661/ijeri.4483

Analyzing the information from the UDA, policies should be decentralized. Therefore, to consider the analysis of the different realities presented by higher education institutions according to the region and the elimination of courses as well as validations in program changes.

By allocating more resources to this benefit, the university also assumes a cost by dealing with this reality: students with lower academic performance. If this problem is not solved, the quality of education, the efficiency of these resources and sustainability overtime may be jeopardized. To conclude, we want to leave the discussion established for future research: who is financing free education and what type of students is it actually benefiting?

6. Conclusions.

Higher education is the basis for the productive, social and economic development of a country, achieving massive access to it and giving equal conditions is the responsibility of all levels of government and the state. With this in mind, governments have made sustained efforts to generate projects. In addition to these measures, it must be assumed that the resources are used efficiently, for which it is necessary to take measures to promote responsibility for the use of these funds. Although it cannot be said that free education is the cause of low academic performance, it can be seen that there is a strong relationship in behaviors that complement this situation. Examples of this relationship are the elimination of courses, the suspension of the benefit, program changes, among others.

This reality shows indications that many students have entered higher education without the necessary prior training to deal with new knowledge or without a clear definition of their career choice. Continuing to study the implications of free education from different perspectives will shed light on the improvements that must be implemented and the measures that must be taken to prevent this social benefit from promoting erroneous behaviors in the Chilean reality. Program change is an option that the free education benefit allows, but at the same time, it is a consumption of this benefit that is not being addressed appropriately. In the future, this will be one of the reasons why many students lose their free education benefit without completing their studies, together with the elimination of courses which, in the particular case of the UDA, has a greater implication. Added to this is the fact that free education has several particularities, to address academic performance without analyzing the institutional reality, and the alternatives offered by regulations of higher education institutions could generate erroneous results. Regarding the results obtained for the case study in this work, the group of students with the benefit analyzed presented as relevant factor their PSU score, followed by the ranking and leaving as a last factor their NEM score. This crossed with the type of establishment of secondary education of origin indicates that the benefit, in this sample, prevails the performance, independently from which type of school they come from, and the program they enter.

Fecha de recepción: 22-04-2020 Fecha de aceptación: 05-05-2020
Burgos-Videla, C. G., Oña, A. & Castillo, W. (2020). Análisis e implementación de la educación gratuita en la universidad de Atacama.
International Journal of Educational Research and Innovation (IJERI), 14, 1-16.
ISSN: 2386-4303. DOI https://doi.org/10.46661/ijeri.4483

7. References

- Barrientos, N. y Araya, L. (2018). 'Educación Superior en Chile' [Higher Education in Chile], Revista *Aletheia 10*(1), 80-109.
- Brunner, J.J. y Labraña, J. (2018). 'Financiamiento de la educación superior, gratuidad y proyecto de nuevo crédito estudiantil' [Higher Education Financing, Free Education and New Student Loan Project], Debates de Política Pública 31. CEP Centro de Estudios Públicos.
- Contraloría General de la República. (2017). *Financiamiento fiscal a la educación superior 2016* [Fiscal financing of higher education 2016].
- Dirección de Presupuestos Gobierno de Chile. (2019). 'Folleto de Prioridades Presupuestarias, Ley de Presupuestos 2019' [Budgetary Priorities Brochure, Budget Law 2019].
- Espinoza, O. y González, L. (2016). La educación superior en chile y la compleja transición desde el régimen de autofinanciamiento hacia el régimen de gratuidad [Higher Education in Chile and the Complex Transition from Self-financing to Free Education], *Revista Latinoamericana de Educación Comparada*, *7*(9), 35-51.
- Espinoza, R. y Urzúa, S. (2015). Las Consecuencias Económicas de un Sistema de Educación Superior Gratuito en Chile [The Economic Consequences of a Free Higher Education System in Chile], *Revista de Educación, 370*, 10-44.
- Marcel, M. y Tockman, C. (2005). *¿Cómo se financia la educación en Chile?* [How is education financed in Chile?] Estudios de Finanzas Públicas. Chile: Ministerio de Hacienda.
- Ministerio de Educación. (2018). *Indicadores de la Educación en Chile 2010-2016* [Education Indicators in Chile 2010-2016]. Santiago: Ministerio de Educación, Centro de Estudios, Unidad de Estadísticas.
- Ministerio de Educación. (2016). *Memoria 2016 Beneficios Estudiantiles* [2016 Annual Report of Student Benefits]. Santiago, Chile: Ministerio de Educación.
- Muñoz, C. (2018). *Financiamiento a la educación Superior. Enfoque en los créditos universitarios* [Funding for Higher Education. Focus on University Loans]. Chile: National Congress of Chile. Advisory document for the Political Committee of Evópoli.
- Organization for Economic Co-operation and Development. (2018). *OECD Economic Surveys: Chile 2018*. Paris. France: OECD Publishing, DOI: http://dx.doi.org/10.1787/eco_surveys-chl-2018-en
- Organization for Economic Co-operation and Development/CAF/Economic Commission for Latin America and the Caribbean. (2018). *Latin American Economic Outlook 2018: Rethinking Institutions for Development*, Paris, France: Éditions OCDE.
- Pacheco, L. y Pacheco, R. (2015). Evolución de la educación superior en el Ecuador: La Revolución Educativa de la Universidad Ecuatoriana [Evolution of Higher Education in Ecuador: The Educational Revolution of the Ecuadorian University]. *Pacarina del Sur* 6(23).

Fecha de recepción: 22-04-2020 Fecha de aceptación: 05-05-2020
Burgos-Videla, C. G., Oña, A. & Castillo, W. (2020). Análisis e implementación de la educación gratuita en la universidad de Atacama.
International Journal of Educational Research and Innovation (IJERI), 14, 1-16.
ISSN: 2386-4303. DOI https://doi.org/10.46661/ijeri.4483

- Pérez, L. (2007). La exigibilidad del derecho a la educación a partir del diseño y la ejecución de las políticas públicas educativas [The Enforceability of the Right to Education Based on the Design and Implementation of Public Education Policies]. *Estudios Socio-Jurídicos* 9(S.1.), 142-165.
- Romer, P. S. (1986). Increasing Returns and Long–Run Growth. *Journal of Political Economy, 94*(5), 1002-1037.
- Senthilkumar, N. y Arulraj, A. (2011). SQM-HEI–determination of service quality measurement of higher education in India. *Journal of Modelling in Management, 6*(1), 60-78. https://doi.org/10.1108/17465661111112502
- Urzúa, S. y Espinoza R. (2014). *Gratuidad de la Educación Superior en Chile en Contexto* [Free Higher Education in Chile in Context]. Work Document, CLAPES, PUC.

8. Notes

1 Taken from: www.gratuidad.cl, www.ayudamineduc.cl, portal.beneficiosestudiantiles.cl

2 More information in: http://portal.beneficiosestudiantiles.cl/contador-de-asignaciones. Information updated on February 14, 2019.

3 Taken from the official website of the university www.uda.cl

4 This information may have been increased or decreased by subsequent resolutions of free education or suspension of benefits.

5 This information considers enrollment until March 2019.

6 For further information see Academic risk model for the Commercial Engineer Degree (Castillo y Molina, 2018).

Fecha de recepción: 22-04-2020 Fecha de aceptación: 05-05-2020
Burgos-Videla, C. G., Oña, A. & Castillo, W. (2020). Análisis e implementación de la educación gratuita en la universidad de Atacama.
International Journal of Educational Research and Innovation (IJERI), *14*, 1-16.
ISSN: 2386-4303. DOI https://doi.org/10.46661/ijeri.4483