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Academic performance at Adventist University of Chile during COVID-19: a comparative analysis 2019-2020

Desempeño académico en la Universidad Adventista de Chile durante COVID-19. Un análisis comparativo 2019-2020

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Resumen

La pandemia por COVID-19 ha obligado a las universidades públicas y privadas a adoptar medios de instrucción de emergencia. La imposibilidad de presencialidad ha forzado la enseñanza remota y la adaptación de los métodos de evaluación. Se podría hipotetizar que estos cambios podrían producir un descenso en el rendimiento académico de los alumnos. Este trabajo analiza a través de un estudio descriptivo el rendimiento académico en los primeros semestres de 2019 y 2020 entre los estudiantes de primer año de la Universidad Adventista de Chile con una muestra de 641 alumnos en asignaturas de especialidad. Contrario a lo previsto por los investigadores, el rendimiento académico en promedio mejoró el 2020 en relación al 2019, esto puede deberse a las estrategias metodológicas innovadoras y políticas de flexibilidad adoptada por la universidad.

Palabras clave: Rendimiento académico, universidades adventistas, estrategias innovadoras, educación universitaria, educación superior

Abstract

The COVID-19 pandemic has forced public and private universities to adopt emergency instructional facilities. The impossibility of presence has forced distance learning and the adaptation of evaluation methods. It could be hypothesized that these changes could lead to a decrease in the academic performance of students. This work analyzes through a descriptive

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study the academic performance in the first semesters of 2019 and 2020 among the first-year students of the Adventist University of Chile with a sample of 641 students in specialty courses. Contrary to what was predicted by the researchers, the average academic performance improved in 2020 compared to 2019, this may be due to the innovative methodological strategies and flexibility policies adopted by the university.

Keywords: Academic achievement, Adventist universities, innovative strategies, university education, higher education

Introduction

The impact of COVID-19 in Higher Education has multiple dimensions (Akbulut, Uğur & Can Esen, 2020; Dobrilǎ, 2020) and has yet to be fully assessed and interpreted. It forced universities to shift to emergency remote teaching (Hodges, Moore, Lockee, Trust & Bond, 2020; Mosquera, 2020) and involved adverse conditions for both teachers and students (Mishra, Tushar, & Shree, 2020; Rahim, Ali, Shabana & Fayyaz, 2020), such as the lack of presence, the impossibility of accessing the university library, the distance between student and teacher, connectivity problems, improvised places to attend online classes, lack of appropriate devices by students, professors that do not know how to teach in the new conditions (Estrada Villafuerte, 2020; Oyedotun, 2020), students perceptions of the new learning situation (Bautista López, Cerna Álvarez & Romero Ruiz, 2020; Mok, Weiyan, Guoguo & Oi Wun Cheung, 2020; Ana *et al*, 2020) and adaptation to it (Sukendro *et al*, 2020) among other factors (Milicevic, Sremcev, Cosic, Ralevic & Lazarevic, 2020). We would expect that those conditions would have negatively affected the academic performance of students in pandemic conditions. The purpose of the research is to verify if there is a difference in the academic performance of the year 2019 and 2020 among the first-year students of the Adventist University of Chile, and how that difference is manifested.

Adventist University of Chile went through some major transformations in the last years (Universidad Adventista de Chile, 2020) that was crucial for its continuity when it was forced to shift to emergency remote learning. It was better prepared and the pandemic also was a core factor to consolidate those transformations. The administration of the university presented clear approaches to how the programs should work during this period (Universidad Adventista de Chile, 2020). However, even if all those policies contributed, an impact on students' academic performance is expected.

Method

Participants

In order to compare, it was selected one class from each of the four schools, that had the same instructor in both years, that is major oriented and belongs to the same year. After applying those criteria, the sample consisted of 641 students from the Adventist University of Chile, See table 1 corresponding to four subjects of the first year of the years 2019 and 2020 of the Schools of Theology, Education and Social Sciences, Engineering and Business and Health Sciences. Subjects were selected from among those that contribute to each career's specialty: Hebrew Theology I, in Education and Social Sciences, Developmental Psychology, In Engineering and business, accounting and financial principles, and in General and Organic Chemical Health Sciences. We formally requested the information from University's authorities and we were granted access to the academic records because this research contributes to the institutional evaluation of 2020 processes.

Table 01
Sample

GROUPS				
Year	Principios Contables Contables y Financieros	Psicología del desarrollo	Química G. y orgánica	Hebreo 1
2019	56	29	247	23
2020	65	20	177	24
TOTAL	121	49	424	47
Total sample 641				

Hypothesis

There is a lower academic performance in the first semester of 2020 than in the first semester of 2019.

Results

We took the subjects' grades as an indicator of academic performance. As we can see in table 2, the t-test results show that in average, the academic performance was better in 2019 than in 2020 (Hebrew1 2019 M = 60.19 SD14.3 2020: M = 60.29 SD = 17.6; Accounting and financial principles: 2019 M = 69.33 SD = 20.1 2020 M = 74.09 SD = 17.1; Developmental Psychology: 2019 M = 83.89 SD = 8.5, 2020 M = 85.10 SD = 12.1; General and Organic Chemistry 2019: M = 54.27 SD = 15.1; 2020 M = 61.79 SD = 12.3). This difference in the averages of General and Organic Chemistry is highly significant ($t = -5.62$ $p < 0.001$). in consequence we must to retain the null hypothesis $H_0: \mu_1 = \mu_2$ for subject score, Admission Score and High School GPA between years 2019 and 2020 in Hebreo I and Psicología del Desarrollo, we also must reject the null hypothesis for Subject Score and High School GPA between years 2019 and 2020 in Principios Contables y Financieros, and Admission Score and High School GPA in Química General y Orgánica. We need to reject the null hypothesis only in Admission Score between years 2019 and 2020 in Principios Contables y Financieros ($p=0.048$) and Subject Score in Química General y Orgánica ($p<0.001$).

Table 2
Independent sample T test results

Variable	Hebreo I								
	n	2019 M	2019 SD	n	2020 M	2020 SD	95% CI for mean		
							t	df	p
Subjet Score	23	60.19	14.3	24	60.29	17.6	-0.25	45	0.980
Adm. Score	23	516.8	85.3	24	626.8	68.4	-4.40	45	0.663
High. S GPA	23	547.3	90.8	24	556.6	98.1	0.37	45	0.781

Variable	Principios contables y financieros								
	n	2019 M	2019 SD	n	2020 M	2020 SD	95% CI for mean		
							t	df	p
Subject Score	56	69.33	20.1	65	74.09	17.1	-1.40	119	0.169
Adm. Score	56	480.6	59.1	65	502.8	62.8	-2.00	119	0.048*
High. S GPA	56	530.7	90.8	65	530.7	89.2	1.30	119	0.194

Variable	Psicología del desarrollo								
	2019			2020			95% CI for mean		
	n	M	SD	n	M	SD	t	df	p
Subject Score	29	83.89	8.5	20	85.10	12.1	-3.48	47	0.684
Adm. Score	29	456.1	39.6	20	476.1	56.8	-1.39	47	0.170
High. S GPA	29	500.3	57.0	20	521.4	70.4	0.71	47	0.274

Variable	Química General y Orgánica								
	2019			2020			95% CI for mean		
	n	M	SD	n	M	SD	t	df	p
Subject Score	247	54.27	15.1	177	61.79	12.3	-5.62	422	0.000**
Adm. Score	247	499.0	60.6	177	495.7	64.3	0.53	422	0.587
High. S GPA	247	550.0	80.8	177	555.3	78.8	-0.68	422	0.494

*p<0.05, **p<0.001

The t-test analysis also shows us that both the Admission test score and High School GPA variables do not obtain values significant enough to explain the difference in academic performance between 2019 and 2020. The only significant value in these two variables is found in the Admission Score for the subject Accounting and Financial Principles (2019 M = 480.6 SD = 59.1 2020 M = 502.8 SD = 62.8 t=2.00 p = 0.048) a value very close to 0.05. However, although this variable's difference is significant, the difference in the academic performance indicator in this subject is not (p = 0.169).

As observed in the table, the trend towards better academic performance in 2020 over 2019 is confirmed by analyzing the data of subject approval by year in table 3. In the cases of a decrease in the approval rate in 2020, the difference in Hebrew I is 12.2%, corresponding to two people, 19 students approved in 2019 and 17 in 2020. In the case of Developmental Psychology, the difference is marginal, 5% corresponding to 1 student failed in in 2020. Although the subject Accounting and Financial Principles rose from 85% to 89% in 2020, representing a modest increase, the subject General and Organic Chemistry showed a significant increase in its approval rate from 66.5% in 2019 to 89.3% in 2020; as well as a notable decrease in their failure rate from 33.6% in 2019 to 10.7% in 2020.

Table 3
Approval Cross tabulation of subject by year

	Year	Not Approved	Approved	Total
Hebreo I	2019	4	19	23
		17,4%	82,6%	100,0%
	2020	7	17	24
		29,2%	70,8%	100%
Ppios. C y F	2019	8	48	56
		14,3%	85,7%	100%
	2020	7	58	65
		10,8%	89,2%	100%
Ps. Desarrollo	2019	0	29	29
		0%	100%	100%
	2020	1	19	20
		5%	95%	100%
Química G y O	2019	83	164	247
		33,6	66,5%	100%
	2020	19	158	177
		10,7%	89,3%	100%
TOTAL		102	322	424
		24,1%	75,9	100%

Table 4
Regression analysis result 2019

Year	Subject	Variable	b	SE	β	t	p
2019	Hebreo I	Constant	16.574	20.03		0.827	0.481
		Admission TS	0.062	0.041	0.366	1.50	0.148
		High School GPA	0.021	0.049	0.131	0.53	0.596
	Ppios. C y F	Constant	17.040	25.03		0.658	0.513
		Admission TS	0.045	0.045	0.133	1.01	0.314
		High School GPA	0.060	0.029	0.270	2.06	0.044
	Ps. Del Desarrollo	Constant	100.51	26.02		3.86	0.001
		Admission TS	-0.028	0.042	0.660	-0.66	0.510
		High School GPA	-0.007	0.049	0.255	-0.25	0.802
Química G y O	Constant	16.743	9.228		1.81	0.071	
	Admission TS	0.038	0.016	0.150	0.15	0.018	
	High School GPA	0.034	0.012	0.182	0.18	0.004	
2020	Hebreo I	Constant	27.087	28.89		0.93	0.359
		Admission TS	0.017	0.069	0.066	0.24	0.807
		High School GPA	0.047	0.048	0.242	0.90	0.377
	Ppios. C y F	Constant	31.284	16.77		1.86	0.067
		Admission TS	0.012	0.037	0.043	0.31	0.753
		High School GPA	0.070	0.026	0.362	2.66	0.010
	Ps. Del Desarrollo	Constant	98.421	31.72		3.10	0.006
		Admission TS	0.024	0.051	0.113	-0.46	0.646
		High School GPA	0.004	0.052	0.021	-0.08	0.932
	Química G y O	Constant	57.510	8.237		6.98	0.000
		Admission TS	0.007	0.016	0.037	0.44	0.654
		High School GPA	0.001	0.013	0.008	0.10	0.920

Hebreo I 2019 $R^2 = 0.454$ $F_{(2,20)}$ $p = 0.099$ 2020 $R^2 = 0.083$ $F_{(2,21)}$ $p = 0.403$

Principios Contables y Financieros 2019 $R^2 = 0.066$ $F_{(2,244)}$ $p = 0.077$ 2020 $R^2 = 0.149$ $F_{(2,62)}$ $p = 0.007$

Psicología del Desarrollo 2019 $R^2 = 0.018$ $F_{(2,26)}$ $p = 0.000$ 2020 $R^2 = 0.013$ $F_{(2,17)}$ $p = 0.007$

Química General y Orgánica 2019 $R^2 = 0.002$ $F_{(2,20)}$ $p = 0.099$ 2020 $R^2 = 0.083$ $F_{(2,174)}$ $p = 0.859$

Table 5
Correlation coefficients (n=641) Predictors 2019 by subject

Variable	Correlation	
	1	2
2019		
1 Admission T. Score		
2 High. S GPA 247		
3 Hebreo 1	0.442*	0.341
4 Ppios. C y F	0.140	0.273
5 Ps. Del Desarrollo	-0.174	-0.030
6 Química G & O	0.186**	0.212**
2020		
1 Adm. Score		
2 High. S GPA 247		
3 Hebreo 1	0.218	0.283
4 Ppios. C y F	0.226	0.384*
5 Ps. Del Desarrollo	-0.114	-0.028
6 Química G & O	0.041	0.024

* $p \leq 0.05$, ** $p \leq 0.001$

The correlation analysis for the admission data for High School GPA and Admission Test Score did not show to be relevant predictors because their R^2 values are too low as is shown in table 4 (Accounting and Financial Principles 2019 $R^2 = 0.066$, 2020 $R^2=0.013$; Psicología del Desarrollo 2019 $R^2 =0.018$ Hebrew I 2019 $R^2 = 0.454$ 2020 $R^2 = 0.083$; Química General y Orgánica 2019 $R^2 =0.002$ 2020 $R^2 =0.083$) The significance values do not show significant values either (Hebrew I 2019 $p=0.099$, 2020 $p=0.403$ Principios Contables y Financieros 2019 $p=0.077$, 2020 Química General y Orgánica 2019 $p=0.099$) except in (Principios Contables y Financieros 2020 $p=0.007$; Psicología del Desarrollo 2019 $p<0.001$, 2020 $p=0.007$).

Discussion

Data analysis does not support the researchers' hypothesis and suggests not only that academic performance in a pandemic is no lower than a typical year but that students

achieved better scores. Academic performance predictors, such as High School GPA and Admission Test Score could not support an explanation for the difference. Other variables, such as subject and instructor remained the same.

The academic measures adopted by the UnACh might explain the difference because they aimed at more complex levels of knowledge, made the conditions for evaluation and approval of subjects more flexible, and focused more on the production of results with the use of available information than in the mere memorization of data. However, those changes cannot explain if there was better academic performance, if it was only a difference in grading and its criteria or if it is a combination of both aspects.

For future research could be helpful to assess the students' performance during 2021 in courses that are built on the ones selected for this study. It would also be important to study the student's perception of this process, an evaluation of other variables mentioned at the beginning of this paper that might affect their academic performance (Saunders-Scott, Bersagel Braley, & Stennes-Spidahl, 2018; Ivbijaro, Brooks, Kolkiewicz, Sunkel, & Long, 2020). The student's own perceptions and, especially, would be interesting to interview the professors (Henríquez Ordenes, 2020) to see how is their qualitative assessment of the student's learning (Popa, Repanovici, Lupu, Norel & Coman, 2020) to verify if the higher scores obtained in 2020 also mean more significant learning of the contents and acquisition of the proposed competencies. It would be relevant to study also how they interpreted the shift of focus in evaluation.

Therefore, this study needs to be complemented with others. However, it contributes to the discussion on higher education during COVID-19 in a variable as important as students' academic performance. It could also bring some insights on the wider transformations higher education is going through, how this pandemic accelerated it (Mladenova, Kalmukov & Valova, 2020), and how the future education should be in the new normal (Berry, 2020; Marcus, 2020; Shah et al, 2020).

Research strengths

The sample covers the university's four schools, the student profile's homogeneity in terms of academic entrance indicators such as high school GPA and entrance test score. The same teacher taught the selected subjects in 2019 and 2020, so a variation in the score cannot

be attributed to the change of teacher. The study sample includes 641 students out of 2,245 that the Adventist University has in 2020, representing 28.55% of the total undergraduate students at Adventist University of Chile.

Research weaknesses

The research takes as an indicator of academic performance the score obtained in highly complex subjects in careers that represent the institution's four schools. Future research may include other means of measuring learning and students at more advanced academic progression levels.

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