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Do you want to become a teacher?

Career choice motivation using behavioral strategies

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Qualified teachers are a fundamental input for any education system. Yet, many countries struggle to attract highly skilled applicants to the teaching profession. This paper presents the results of a large-scale intervention to attract high performing high-school students into the teaching profession in Chile. The intervention was a three-arm email campaign which made salient three types of motivations typically associated with the teaching profession: intrinsic/altruistic, extrinsic, and prestige-related. The objective was to identify which type of message better appealed to high performing students to nudge them to choose a teaching major. The “intrinsic” and “prestige” arms **reduced** applications to teaching majors among **high** performers, while the “extrinsic” arm **increased** applications among **low** performers. A plausible interpretation could be that the “intrinsic” and “prestige” messages made more salient an issue that could otherwise be overlooked by high performing students (typically from more advantaged households), negatively impacting their program choice: that while the social value of the teaching profession has improved, it still lags behind other professions that are valued more by their families and social circles. In turn, the “extrinsic” arm made salient the recent improvements in the economic conditions of the teaching profession in Chile, thus appealing to low performing students who in general come from disadvantaged families and for whom monetary incentives are potentially more relevant. These results emphasize the importance of having a clear picture of the inherent motivations that could influence individuals career choice. Making salient certain types of motivations to the wrong target group could lead to undesired results.

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1. Introduction

Public education is crucial to equalize the opportunities of students from different socioeconomic backgrounds. This goal is jeopardized when there is an insufficient supply of qualified teachers, a challenge faced by many countries in Latin America (Bertoni et al., 2020). Many governments have adopted policies aimed at reducing teacher sorting (that is, qualified teachers working disproportionately in higher-income areas; see Jackson et al. 2009). While some of these policies may be effective to attract high performing teachers where they are most needed (Ajzenman et al., 2020; Alva et al., 2020), making the teaching career attractive for highly skilled individuals may be a more sustainable solution as it would increase the pool of qualified teachers.

This paper presents the results of a large-scale intervention to attract highly qualified high school students to the teaching profession in Chile. Chilean students who decide to major in education have on average lower scores on the general university entrance examination (henceforth PSU) than students who choose higher-status majors (i.e. medicine or engineering), signaling the low prestige of the teaching profession in the country (Figure 1). The intervention presented in this paper --a four-month email campaign targeted to last year high-school students across the country (N=81,118)-- was conducted by Elige Educar (a Chilean NGO focused on improving the status of teaching) and the Inter-American Development Bank (IDB) and used insights from behavioral economics to make salient three types of motivations (intrinsic, extrinsic and prestige-related) often emphasized in the literature as teachers' drivers (see for instance Hoyle, 2001) with the goal of attracting highly qualified students to choose education as a university major.

The experiment included three arms. Students in the three arms received weekly emails for 17 weeks. The emails in each arm encouraged students to choose to study education by highlighting a different type of motivation out of the main teachers' motivations (extrinsic, intrinsic, and prestige-based motivations; see Hendricks, 2014; Lankford et al., 2014; Watt et al., 2012). The "extrinsic arm" emphasized the material benefits of pursuing a teaching career, highlighting recent improvements in teacher salaries, and working conditions. The "intrinsic arm" appealed to the feelings of satisfaction derived from helping others. The message's idea was to show that a big part of the reward teachers receive for their hard work is changing people's lives (a motivation typically associated with teachers, see Richardson and Watt, 2010, for a review). The "prestige arm" emphasized the improvement in terms of prestige that teachers have gained during the last years in the country. The control group received objective information related to the application process without emphasizing any specific type of motivation. The outcomes (students' application to college/university majors) were measured a few months later, six weeks after students took the PSU.³

Our results show that some of the nudges produced unexpected results. The "intrinsic" arm had a negative and significant effect (versus control) on the probability of high-performing students (those that performed above the median PSU score) applying to at least one major in education, selecting a teaching degree as their first preference, and including a greater proportion of education majors in their career choice set. The effect was null for the rest of the students. A similar, although less robust effect was found for the "prestige" arm. The "extrinsic" arm, in turn, showed no effect on high performers, but a small positive effect on the probability of low performing students choosing an education major as their first career choice. Interestingly, when analyzing heterogeneous effects by an individual index of implicit prosociality (based on students'

³ The intervention took place after the beginning of social and political unrest in Chile. The protests, which began in October 2019, caused the national qualifying exam scheduled for December 2019 to be postponed to January 2020. The university admission process was carried out as planned, a month and a half later.

major preferences other than education professions), we find that the "extrinsic arm" was relatively successful at attracting among somewhat less prosocial individuals to teaching careers.

High-performers in our sample tend to be students from relatively better-off households (63.2% of private school students are high-performers vs 17.2% who studied in public schools) with greater opportunities of pursuing more lucrative careers. This could explain why the "extrinsic arm" messages were not attractive to them, while they were more attractive to relatively lower performing students. The mild negative effect of the "prestige arm" on high performers could be related to the fact that, although the teaching career has become more prestigious over time⁴, it is still not considered a particularly high-status degree among more advantaged students that prioritize careers like engineering, law, medicine, and economics (Elacqua et al., 2018). Emphasizing prestige, even in a positive way, could backfire by making the issue salient (Barrera et al., 2020). The "intrinsic arm" was designed to emphasize positive aspects related to teaching careers (helping others, triggering a social change). However, it may have made salient that the type of "rewards" teaching can offer are not those that may matter the most for individuals from households whose members typically pursue more lucrative and prestigious careers.

Our results relate to the literature on intrinsic and extrinsic motivations (Deci, 1975), to research on career motivation (Dolton, 2006; Han et al., 2018; Watt et al., 2012; Heinz, 2015) and, more generally, to the literature on teacher recruitment (e.g. Bertoni et al., forthcoming). The teacher education literature has mostly emphasized motivations related to extrinsic motives (money, holidays, stability; Hendricks, 2014; Murnane et al., 1989), intrinsic motives, including altruism (the joy of being in the service of the community and society; Brookhart and Freeman, 1992; Watt et al., 2012) and, broadly defined, prestige (Lankford et al., 2014; Hoyle, 2001, Elacqua et al., 2018). Our paper makes an empirical contribution to the literature by providing experimental evidence on the effects of priming individuals' motivations to become teachers. Empirical papers have shown that, depending on the context, extrinsic and intrinsic motivations could be complements or substitutes (Gneezy and Rustichini 2000, Frey and Oberholzer-Gee 1997 and Mellström and Johannesson, 2008, Lacetera et al. 2012, Goette and Stutzer 2020). Thus, the effect of priming intrinsic or extrinsic motivations is uncertain, especially when the goal is to induce a behavior potentially seen as prosocial (such as choosing a career in education). We contribute to this literature by showing how priming these motivations and thus making them salient could backfire when the individuals' inherent motivations are wrongly targeted, an important result not only for the education literature but, more broadly, to inform any intervention that uses motivation priming to induce a behavioral change.

2. Context

Chile faces a shortage of quality teachers in its school system (Madeiros et al., 2018; Elige Educar, 2020; Bertoni et al., 2020). There are estimations that by 2025 there could be a scarcity of more than 30,000 qualified teachers. Over the last decade, the government has adopted several policies that attempted to improve teacher quality. First, in 2012, the Ministry of Education introduced scholarships for high performing high-school students who aspired to become teachers. Second, in 2016, new legislation was enacted to increase teachers' salaries by more than 30% while reducing the number of hours of instruction time, substantially improving teachers' quality of life. Finally, since 2017, higher admission requirements have been established for teaching degrees with the goal of attracting highly skilled individuals into the teaching profession. While improving the quality of the pool of candidates by targeting higher performing students, this

⁴ Índice Elige Educar GfK 2019: <http://www.revistadeeducacion.cl/segun-indice-de-elige-educar-y-gfk-profesores-se-consolidan-como-la-cuarta-profesion-mas-valorada-en-chile/>

last measure may exacerbate teacher shortage in the country, as suggested by recent data on university admissions.

This intervention builds and expands on an existing program by Elige Educar that has been ongoing since 2017. This NGO's mission is to attract high performing students to the teaching profession, understanding that teachers are a fundamental input in children's learning (Araujo et al., 2016). To achieve this goal, the original program carried out a general communications campaign to improve the teaching profession's social standing and encouraged high-school students to pursue a career in teaching. For the 2020 university admission process, Elige Educar partnered with the IDB to design and implement an experiment using insights from behavioral economics to appeal to last year high school students' extrinsic, intrinsic, and prestige motivations, and evaluate the most effective strategies to attract high performing students to the teaching profession.

3. Experimental Design

This experiment was carried out with 81,118 last year high-school students who declared on a survey conducted by Elige Educar that they might be interested in pursuing a career in teaching, out of the approximately 320,000 students who take the PSU⁵ each year. Students were randomly assigned to one of the three treatment arms ("intrinsic", "prestige", or "extrinsic") or to the control group, stratifying by gender, geographic region, and type of school they attended (public, private subsidized and private non-subsidized⁶).

We sent each treatment group 22 email newsletters over 17 weeks with messages encouraging them to choose a teaching career highlighting three types of motivations. For the extrinsic group, we highlighted recent improvements in working conditions and monetary benefits of the teaching profession (Han et al. 2018; Kerr, Pekkarinen, Sarvimäki, & Uusitalo, 2015). For instance, teachers' high starting salaries compared graphically to other professions such as law, psychology, or nursing; or aspects such as the profession's high employability were also highlighted. Guided by studies such as Shabbir et al. (2014), the intrinsic arm emphasized aspects such as the joy or satisfaction of influencing children's development or helping those in need. Some of these messages reinforced the idea of the impact of teaching work on low SES children or collected testimonials from teachers who were passionate about teaching. Understanding that the status of the profession may play a role in attracting qualified candidates (Lankford et al., 2014), the prestige arm reinforced the idea that teaching is a career valued by society and essential for the development of the country. For example, some of the messages in this group were statements from former high performing high school students who had decided to study education. The control group received the same number of newsletters with purely informative content, such as the requirements of a teaching degree. Since we conducted this intervention during a stressful moment for high-school students, some messages (five in total) provided information on the exam and the application process. (See appendix A).

During the four months of the intervention, the students prepared and sat for the PSU, waited for their results, and applied to their preferred undergraduate majors. We sent the first newsletter two

⁵ The PSU functions as a general university entrance examination. Students take the PSU, and then apply to their preferred course of studies once they know their results. Each major has different requirements, with traditional careers such as engineering, medicine or law requiring the highest scores.

⁶In Chile, in 2020, 54% of students attended private subsidized schools, 36% municipal schools, and 9% private non-subsidized schools (mineduc.cl).

months before they took the PSU, and the last message was sent on the day university applications closed. Of the 81,118 students contacted, 33,583 sat for the test and applied to at least one major. Of those, 18,383 chose teaching as one of their degree options, and eventually, 8,487 students were admitted to a teaching program. Table 1 shows the balance of the treatment and control groups.

We base our estimations on the 33,583 students who took the PSU and applied to an undergraduate degree. After students learn their score on the PSU, they can apply to up to ten colleges and degree programs. To measure the overall impact of the motivational strategy on different students' career decisions, our empirical strategy is to run regressions of the following form:

$$y_i = \alpha T_i + X_i\beta + \varepsilon_i$$

where y_i is a preference outcome for a teaching career in high-school student i . T_i is a dummy that indicates whether candidate i received either an extrinsic, intrinsic or prestige treatment, and X_i is a vector including a constant and student control variables, namely gender, type of school, year of high-school graduation, PSU score, high-school GPA score, and school socioeconomic status. The analysis includes three different outcomes: (i) if the student chose an education major as one of the ten options on the university application, (ii) if the candidate chose an education degree as the first option, and (iii) the proportion of education majors on the student's list of preferences.

4. Results

Table 2 presents the main results. We show the three outcomes related to students' career choice: "Chose an education career as the first option" (Panel a), "Proportion of education majors in the choice set" (from 0 to 100%, Panel b) and, finally, "Applied to an education degree" (which takes a one if at least one option of the choice set was an education major, Panel c), dividing the sample into high vs low performers, above or below median using the PSU score). Overall, there is a null (and precisely identified) effect on any of the three outcomes. However, these averages mask interesting heterogeneous patterns.

Panel a shows a significant negative effect of the **intrinsic arm** on the probability of ranking a teaching career as the first choice among high performers (2.8 pp, of a mean of 0.32). The effect is similar when analyzing the proportion of education major options included in the choice set (Panel b: 2.3 pp, of a mean of 0.31) and the probability of choosing at least one education major option (Panel c: 2.7 pp, of a mean of 0.52). No effect was detected among low performers. Considering that high performers tend to come from better-off households with lucrative and prestigious career aspirations, a plausible interpretation of these results could be that the "intrinsic" arm made salient the "wrong" motivations for that target.

The **prestige arm** presents similar results, although less robust. There is a negative effect (Panel a: 2 pp, of a mean of 0.32) on the probability of ranking a teaching career as the first choice among high performers. The pattern is similar although not significant when analyzing the other two outcomes. We could not identify any effect among low performers. A plausible explanation is that that, again, this arm made a crucial motivation salient for students from relatively wealthier families, for whom prestige is an important motivation (Elacqua et al., 2018). Although teaching careers in Chile have gained prestige over time, they are still not considered particularly

prestigious among better-off households. Emphasizing prestige, even in a positive way, could have backfired by making the issue salient (Barrera et al., 2020).

Finally, the **extrinsic arm** shows a distinctive pattern. While there was no effect on high performers, there was a small effect on the probability of ranking a teaching career as the first preference among low performers (Panel a, 1.8 pp, of a mean of 0.38). Given that low scoring students typically come from relatively lower-income households, monetary incentives (salary, scholarships) could make a difference at the margin.⁷

5. Discussion

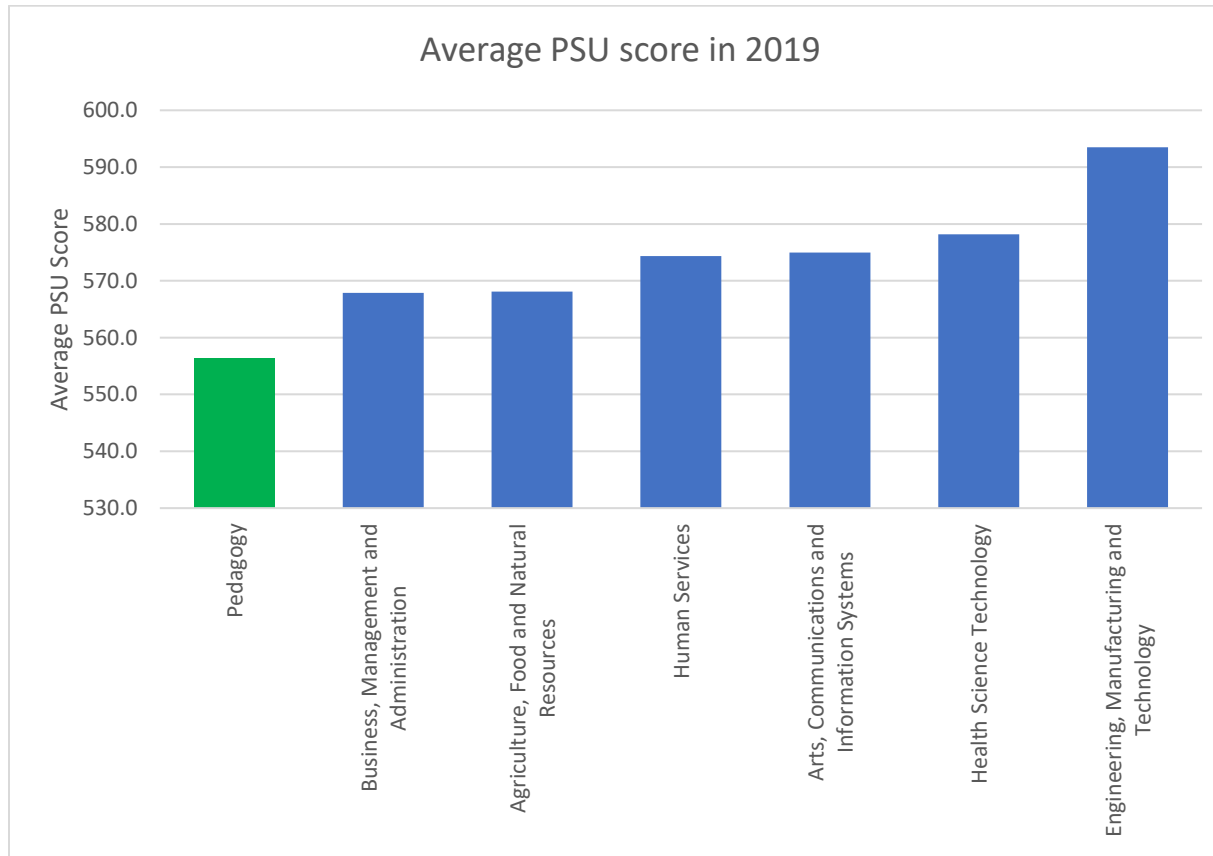
We show the effect of a behaviorally-informed intervention to motivate high performing high-school students to apply to Education majors. Our intervention, which was designed in partnership with Elige Educar, consisted in a four-month email campaign that encouraged students to apply to education degree programs appealing to three motivations typically emphasized by the literature on teaching motivations: intrinsic motives, extrinsic/monetary motives, and prestige-based motives. The results show that the intrinsic and prestige arms reduced the probability of (relatively) high-performers of applying to teaching careers. The extrinsic arm was only successful at attracting (relatively) low performers.

Our results have important policy implications. The type of motivations and techniques used in our intervention are commonly used to trigger desired behavioral changes. Our results emphasize the importance of having a clear picture of the kind of inherent motivations that could potentially influence individual preferences. Making salient certain types of motivations to the wrong target group could lead to undesired results.

⁷ We further explored the effects of the extrinsic arm dividing the sample between prosocial versus non prosocial individuals, based on the career choice set after sitting for the PSU. Following the Minnesota State Career field classification, we divided all career choices in six categories: i) Agriculture, Food and Natural Resources; ii) Business, Management and Administration; iii) Arts, Communications and Information Systems; iv) Engineering, Manufacturing and Technology; v) Health Science Technology; and vi) Human Services. For prosocial we considered iii), v), and vi). Among them, Art, Journalism, Literature, Theater, nursing, Medicine, Nutrition, Psychology, Vet, Dentistry, Law and Public administration. For both the probability of ranking a teaching career in the first place and the proportion of education majors included in the choice set, we identified a positive effect among individuals classified as not prosocial (Panel a, 2.5 pp, of a mean of 0.13; panel b, 1.7 pp, of a mean of 0.13, respectively). Among individuals who do not have any particular interest in engaging in altruistic/prosocial activities, the monetary incentives are important, while they do not seem to be relevant among those that have a more altruistic inclination. It is important to note that these results are only exploratory and not causal, given that the career choice set may have been affected by the intervention.

Tables and Figures

Figure 1: Average PSU Score in 2019



Note: Majors are classified according to the Minnesota State Career field classification (<https://careerwise.minnstate.edu/careers/fields.html>)

Average PSU scores (math and verbal) for students admitted to a university program in 2019. The PSU has an of 500 points and a standard deviation of 110, with a minimum of 150 and 850 points. The graph includes only first-year college students who are enrolled in programs that require PSU scores.

Table 1: Balance Test

	Total	Control	Groups			P-value		
			Extrinsic	Intrinsic	Prestige	C=E	C=I	C=P
N Original Groups	81,118	20,459	20,220	20,220	20,219			
N Final groups (with applications)	33,583	8,471	8,379	8,402	8,331			
Student Characteristics								
Female	61.6%	61.6%	61.5%	61.4%	61.8%	0.89	0.78	0.78
Public School	33.4%	33.4%	33.8%	33.7%	32.8%	0.56	0.70	0.39
Graduated in 2019	61.3%	61.3%	60.9%	61.0%	61.9%	0.55	0.63	0.42
High GPA	37.9%	37.6%	37.9%	38.1%	38.1%	0.74	0.50	0.55
High PSU Score	41.5%	41.6%	41.1%	42.0%	41.3%	0.47	0.66	0.63
GPA score (Sd)	576 (97)	575 (97)	575 (97)	576 (98)	576 (97)	0.79	0.52	0.56
PSU score (Sd)	525 (79)	525 (79)	525 (78)	527 (78)	525 (80)	0.69	0.34	0.52
High SES (school)	22.3%	22.3%	22.5%	22.2%	22.0%	0.76	0.88	0.63
Prosocial profile ¹	73.2%	73.1%	73.2%	73.3%	73.0%	0.98	0.80	0.86

Note: Robust standard errors; * p < 0.10 ** p < 0.05 *** p < 0.01. Balance tests were performed on the final group (N=33,583).

¹ We define prosocial as that student who mostly applied to careers of a social nature, without taking pedagogies into account. According to a Minnesota State Career field classification these careers correspond to undergraduate degrees in health, arts, and human services.
<https://careerwise.minnstate.edu/careers/fields.html>

Table 2: Main Results**Panel a: Ranked an education major as the first option**

	All	High Performer	Low Performer	Prosocial	Not Prosocial
Extrinsic arm	0.0073 (0.0073)	-0.0073 (0.0110)	0.0183* (0.0101)	0.0036 (0.0088)	0.0253** (0.0120)
Intrinsic arm	-0.0074 (0.0073)	-0.0276** (0.0108)	0.0037 (0.0101)	-0.0014 (0.0087)	0.0126 (0.0117)
Prestige arm	-0.0021 (0.0073)	-0.0206* (0.0110)	0.0114 (0.0101)	0.0021 (0.0088)	0.0137 (0.0118)

Panel b: Proportion of education majors included in the choice set

	All	High Performer	Low Performer	Prosocial	Not Prosocial
Extrinsic arm	0.0017 (0.0059)	-0.0043 (0.0089)	0.0062 (0.0081)	-0.0031 (0.0055)	0.0168** (0.0076)
Intrinsic arm	-0.0100* (0.0059)	-0.0228*** (0.0087)	-0.0034 (0.0081)	-0.0032 (0.0055)	0.0064 (0.0075)
Prestige arm	-0.0046 (0.0059)	-0.0128 (0.0089)	0.0020 (0.0082)	-0.0022 (0.0055)	0.0069 (0.0076)

Panel c: Applied to at least one education major

	All	High Performer	Low Performer	Prosocial	Not Prosocial
Extrinsic arm	-0.0006 (0.0076)	-0.0070 (0.0119)	0.0032 (0.0102)	-0.0091 (0.0104)	0.0185 (0.0161)
Intrinsic arm	-0.0109 (0.0076)	-0.0271** (0.0118)	-0.0006 (0.0102)	-0.0089 (0.0103)	-0.0027 (0.0161)
Prestige arm	-0.0073 (0.0076)	-0.0131 (0.0119)	-0.0044 (0.0102)	-0.0046 (0.0104)	-0.0081 (0.0160)

Note: All regressions include the following controls: gender, high-school system (municipal or private), year of graduation, high-school GPA, PSU exam score, and dummy for High SES. High-performer is defined as a student that scored above the 75 percentile in the PSU exam. "Prosocial" is defined as the student who mostly applied to careers of a social nature, without taking pedagogies into account. According to a Minnesota State Career field classification these careers correspond to undergraduate degrees in the health field, art, and human services. <https://careerwise.minnstate.edu/careers/fields.html>.

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Appendix A: Newsletter examples

Extrinsic



Hola, << Test First Name >>.

Desde 2017, los salarios de los docentes aumentaron más de 30% en promedio gracias a las reformas impulsadas en la ley de Carrera Docente. Hoy, los profesores recién egresados parten ganando más que la mayoría de los ingenieros comerciales, abogados o psicólogos.



Además, los salarios docentes se pueden incrementar en más de \$150.000 pesos por un recién egresado si se consideran otros bonos, incluyendo bonos de vulnerabilidad, excelencia y zona promedio.

Que no te cuenten cuentos, sigue tu vocación y ¡ELIGE EDUCAR!

¡Saludos y estamos en contacto!



Intrinsic



Hola, << Test First Name >>.

Todos los buenos docentes aplican constantemente prácticas innovadoras en sus aulas para lograr mejores resultados con sus alumnos. Como Elige Educar, queremos inspirarte con algunos ejemplos que algún día podrás utilizar en tu propia sala de clases.



Esperamos que el trabajo de estos grandes profesores te haya motivado a querer ser uno de ellos.

¡Saludos y estamos en contacto!



Prestige



Hola, << Test First Name >>.

De acuerdo con un estudio de GfK - Adimark y Filge Educar realizado a comienzos de 2019, la gran mayoría de los chilenos y chilenos valora la profesión docente. Destacamos principales resultados:



Si tienes vocación de profesor, ¡fíjate ser parte de esta profesión prestigiosa!

Que no te cuenten cuentos, sigue tu vocación y ¡ELIGE EDUCAR!

¡Saludos y estamos en contacto!

*Datos corresponden a porcentajes aproximados de encuestados que respondieron estar Muy de Acuerdo y de Acuerdo a la pregunta de: ¿Cuán de acuerdo estás con las siguientes frases? 1.- Los profesores realizan un aporte a la sociedad mayor que el de cualquier profesión (78%). 2.- Apoyaría a mi hijo/hija si quisiera estudiar para profesor (78%). 3.- Es una vergüenza ser profesor en Chile (60%).

