

The Evolution of Virtual Concept of Education: Analysis of the Revealed Preferences and Digital Challenges

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Abstract

Distance education offers flexibility and accessibility to students with diverse needs and contexts. However, it is crucial to understand the factors that motivate students to choose this educational modality, especially in programs like Public Accounting, which require specific skills. The general objective of this article is to analyze the determinants in the decision to study the Public Accounting Program in a distance or virtual modality at the National Open and Distance University (UNAD). A mixed methodology is employed, supported by authors such as Creswell (2014), combining quantitative and qualitative data, and using the Probit model to identify factors influencing this choice. A significant finding is that tuition cost, the Saber 11 test score and parents' education are significant variables affecting students' decisions, with tuition cost having the greatest influence on the probability of choice.

Keywords: Distance Education, Public Accounting, Determinant Factors, Probit Model.

1. Introduction

Determinant Factors in the Choice of Distance Public Accounting Programs: A Case Study at the National Open and Distance University (UNAD)

Distance education has gained relevance in recent years, especially in programs like Public Accounting, which have traditionally been associated with in-person education. This trend addresses the need to make higher education more flexible and accessible, allowing individuals with various responsibilities to continue their studies (Aretio, 2014). This study focuses on analyzing the variables that influence the choice to study Public Accounting in a distance learning modality at the National Open and Distance University (UNAD). The goal is to identify

the main motivations and obstacles faced by students and graduates of this program, aiming to enhance the educational offerings and support students in their academic journey. The research employs a mixed-methods approach, combining quantitative and qualitative data, and uses the Probit model to examine the influence of factors such as tuition cost, Saber 11 test scores, and parents' education on students' decisions. This analysis provides a deeper understanding of the dynamics affecting the choice of distance learning programs, contributing to the optimization of educational policies and student support strategies (Montiel, 2019; Roig Vila, 2015).

Consumer Behavior and Decision-Making Analysis: An Approach from the Theory of Revealed Preferences and the Theory of Rational Choice

The Theory of Revealed Preferences (TRP) has become a cornerstone in the study of consumer behavior, providing a theoretical basis for analyzing how individuals make consumption decisions based on their revealed preferences through market choices. This theory was initially developed by G.B. Antonelli and formalized by P.A. Samuelson in 1948, who introduced the axiom of revealed preferences. This axiom states that if a consumer chooses one set of goods over another when both are affordable, it reveals a preference for the first set. This preference remains consistent even when income and prices change, as long as the choices align with the consumer's budget.

One significant contribution of TRP is its ability to infer a consumer's utility function without direct observation. Samuelson and Little (1949) argued that TRP offers a way to overcome the limitations associated with directly measuring preferences, allowing for an accurate representation of utility through observed choices. This approach has been fundamental in microeconomics, particularly in modeling consumer behavior and market demand.

McFadden (2001), a Nobel Prize-winning economist, expanded the TRP framework by developing discrete choice models, such as the logit model. These models are used to analyze decisions where consumers choose among a finite number of alternatives, like different products or services. The logit model, for example, is widely used in transportation studies to understand travelers' preferences for various modes of transport. Additionally, it is applied in marketing to analyze purchase decisions and in housing studies to assess consumer preferences for different types of housing. These models are powerful tools for the empirical analysis of revealed preferences, as they allow estimation of the likelihood that a consumer will choose a particular option based on the attributes of the available options and the characteristics of the consumer.

The mathematical formalization of TRP by Mas-Colell, Whinston, and Green (1995) has been crucial for its application in economic analysis. Their work provides a solid theoretical foundation that enables economists to use TRP in various contexts, from production theory to social welfare analysis. The clarity and rigor of their exposition have facilitated the adoption of TRP as a standard tool in economic research.

Beyond its theoretical applications, TRP has significant practical implications. For instance, economists can use it to design policies influencing consumer behavior, such as taxes on specific goods or subsidies for certain products. By understanding how consumers' preferences respond to changes in prices and income, policymakers can anticipate the impact of economic

interventions and make informed decisions to achieve specific goals, such as improving social welfare or reducing the consumption of harmful goods.

The Theory of Rational Choice (TRC) also focuses on analyzing human behavior from the perspective that individuals act rationally when making decisions, seeking to maximize their utility or well-being. This approach has its roots in economic and political philosophy and was formalized by authors such as Kenneth Arrow (1951/1963), Anthony Downs (1957), William Riker (1973), and James Buchanan (2003). TRC assumes that individuals have clear, consistent, and transitive preferences and choose the option that maximizes their utility based on these preferences.

In his work on social choice theory, Arrow addressed the limitations of aggregating individual preferences into collective decisions, highlighting Arrow's impossibility theorem. This theorem establishes that no voting system can convert individual preferences into a complete social preference without violating at least one of certain desirable criteria. This finding underscores the challenges of applying TRC in political and social contexts, where individual decisions must be integrated into a collective framework.

Downs (1957) applied TRC to political science, particularly in analyzing electoral behavior. In his "homo economics" model, voters are considered rational agents who choose between political parties or candidates based on which one maximizes their expected benefit, considering factors such as policies, campaign promises, and past performance. This approach has significantly influenced voting theory and understanding of electoral participation and campaign strategy design.

Similarly, Riker (1973) and Buchanan (2003) expanded TRC by analyzing how political institutions and rules shape individual behavior. Riker explored coalition formation and game theory in politics, demonstrating how political actors use rational strategies to form alliances and maximize their power. Buchanan, on the other hand, was a pioneer in public choice theory, applying TRC principles to public decision-making, including policy-making and public administration. His work highlights how constitutional rules and institutional structures can shape individual incentives, influencing the efficiency and equity of collective outcomes.

In alignment, Buchanan et al., (1980) contributed to the analysis of TRC by studying "rent-seeking," where individuals or groups use resources to gain economic benefits through manipulating the political or regulatory environment rather than through productive activities. This phenomenon exemplifies how rational decisions at the individual level can lead to socially inefficient outcomes, a central theme in public choice and political economy.

Finally, Aron (1968) emphasized the importance of free will and individuals' ability to make rational decisions, even in complex contexts and under uncertainty. This emphasis on human agency and rationality is fundamental to TRC, especially when applied to decisions with long-term consequences, such as choosing a career. TRC provides a framework for analyzing how individuals evaluate their educational and professional options, considering factors such as the expected return on investment in education, employment opportunities, and personal aspirations.

Evolution and Determinant Factors in Choosing a Career in Public Accounting

De Dios Jiménez and Salas (1999) point out that prospective students' decisions are related to the need for academic training, a topic highlighted by the publication of Becker's book "Human Capital" (1964). This work was pioneering in analyzing individual investment in education through price theory and the determination of wages over a working life. Various theories have been developed in economics and other social sciences to understand how the demand for education functions, focusing on costs, current income, future income expectations, and unemployment. Skills, income, and employment prospects are likely the main determinants of the demand for education.

Montesano and Zambrano (2013) identified several factors influencing students' decisions to pursue a career in Public Accounting. These factors include the distance between residence and study center, socioeconomic level, tuition cost, available financial aid, and the institution's prestige. They conducted a detailed statistical study using probability calculation tables and a Probit econometric model to evaluate students' preferences. This approach allowed them to analyze the behavior of various variables in students from three universities: Universidad Santa María, Universidad Católica Andrés Bello, and Universidad Metropolitana.

Sarmiento Espinel and Silva Arias (2013) conducted an analysis of accounting education in Colombia, covering aspects such as students' socioeconomic conditions, preferences, academic performance, and the academic and institutional environment. Using a sample of 3,404 students from 60 universities offering the program in 2007, they found that 57.04% of the students were women, with an average age of twenty-four years. Most of these students' parents had secondary and postgraduate educational levels, and the average family income ranged between two and three legal minimum wages (MLW). Most students came from non-public schools (calendar A) and financed their studies with family income and loans. Additionally, 36.35% of students worked while studying, dedicating an average of 87 minutes weekly to academic activities and consulting an average of three resources.

Ordóñez Noreña (2015) highlights that, according to a survey applied to 76 Public Accounting students, they consider the career an attractive option due to its economic status. However, they do not see it solely as an applied technique but understand its broader nature. Despite this, the research also reveals a lack of interest in academic research among students, suggesting a lack of awareness of potential research topics in their field. Generally, students seem to have a superficial understanding of Public Accounting, based on common-sense notions, motivated mainly by the expected economic and material benefits.

Villota Fonseca et al. (2019) state that, according to their study, 58.97% of surveyed students show a vocational orientation towards accounting and administrative sciences. This indicates a connection between their aptitudes and interests and the program they are studying.

Additionally, Hernández et al. (2020) found that scholarship policies and funding programs are key determinants for low-income students considering this career. Furthermore, Almaamari & Mslem (2024) suggest that the perception of job stability and long-term financial security associated with the accounting profession are important motivations for students, especially in unstable economic contexts.

Recent research highlights new trends in choosing careers in Public Accounting. Mejía et al., (2022) note that integrating digital technologies into accounting education has increased students' interest in programs offering training in accounting software and data analysis. This reflects a growing demand for digital skills in the job market. emphasize the role of sustainability and ethics in accounting, noting that a growing number of students choose this career intending to apply ethical principles in their future professional practices, responding to a growing social demand for transparency and corporate responsibility.

In conclusion, this research has multiple implications for designing academic programs and educational policies in Public Accounting. By better understanding the factors influencing career choice, educational institutions can adjust their academic offerings to align more closely with students' expectations and needs, thus improving retention and academic success. For example, integrating digital technologies and modules on sustainability and ethics can attract students interested in these emerging areas. Additionally, scholarship and financial aid policies should be designed to be accessible to students from diverse socioeconomic backgrounds, promoting greater inclusion and diversity in the field. Finally, emphasizing research and developing critical skills, such as data analysis and understanding ethical principles, will prepare students to face the challenges of the current and future job market, increasing their employability and contribution to society.

2. Methodology

This study adopts a mixed-methods approach that combines quantitative and qualitative data to address the research objectives. It is important to note that quantitative research seeks to explain large populations and groups from an objective and neutral perspective, focusing primarily on numbers and quantifiable data, as indicated by Galeano (2004). This approach allows for a more comprehensive understanding of the phenomena being studied, integrating the depth of qualitative data with the breadth of quantitative data (Creswell & Plano Clark, 2018; Johnson, Onwuegbuzie, & Turner, 2007; Tashakkori & Teddlie, 2010). The present work has an explanatory scope, as the statistical approach used allows for defining the factors that influence the decision to study the Public Accounting program, particularly in the virtual modality at the National Open and Distance University.

The Probit model is a type of dependent variable model, with parameters estimated using the maximum likelihood method to obtain coefficients with asymptotically normal and efficient characteristics, as described by Wooldridge (2010). To evaluate the probability model (Probit) and the marginal probabilities of each explanatory variable, the statistical software Stata is used, along with data from students enrolled in 2021 and 2022 at the National Open and Distance University's CEAD in the South zone. A cross-sectional binomial Probit model is proposed, focusing on a series of vectors of variables that can be grouped into economic, social, family, and prior competency categories, where the data collected are at levels or categories.

Study Results on Determinant Factors in Choosing a Public Accounting Career in Virtual Modality

To better understand the factors influencing the choice of a Public Accounting career in the virtual modality at the National Open and Distance University (UNAD), a random survey was conducted among students in this modality in the South Zone. This study focused on analyzing socioeconomic, academic, and family variables, as well as students' prior competencies. The results provide a detailed view of the key elements affecting students' decisions when opting for this academic program.

Gender Distribution

The results show that the majority of students entering the Public Accounting program in the virtual modality are women, representing 69.4%, while men constitute 30.6%. No participation from non-binary gender individuals was recorded (Galeano, 2004; StataCorp, 2021).

Social Stratification

Regarding social stratification, 42.2% of the students belong to stratum two, followed by 34.1% in stratum one and 21.2% in stratum three. This distribution is partly explained by the national government's "Generación E" program, which mainly benefits students from strata 1 and 2 (Wooldridge, 2010; Tashakkori & Teddlie, 2010).

Financial Considerations

It was found that 86.9% of students considered cost a decisive factor in studying Public Accounting at the National Open and Distance University (UNAD), especially due to the availability of tuition-free policies or external financing mechanisms. This allows students to cover the costs of tuition, student insurance, ID cards, and graduation fees without incurring opportunity costs, as they can work while studying (Creswell & Plano Clark, 2018).

However, 47.1% of students had not accessed university loans or government tuition-free programs, funding their education with their resources. This suggests a greater concern about the costs of academic credits among these students (Johnson, Onwuegbuzie, & Turner, 2007). A concerning aspect is that approximately 50% of respondents lack information about the average salary of Public Accounting graduates in Colombia, indicating uninformed decision-making based on tradition or the profession's social prestige (Altbach et al., 2009).

Technology Access

Regarding access to technology, 91.8% of surveyed students have a computer for their academic activities, reflecting good access to the necessary technology for virtual education. However, 69.4% of students lived in urban areas after finishing high school, while 30.6% lived in rural areas, indicating potential difficulties in accessing quality internet in rural areas (Galeano, 2004).

Program Flexibility

When choosing a career, 88.2% of students considered the program's duration, noting that the National Open and Distance University (UNAD) offers flexibility with four academic periods per year, allowing the program to be completed in three years. Additionally, 96.5% value the

virtual modality for its flexibility in studying and working simultaneously (StataCorp, 2021). Regarding standardized test scores, the test score is not a decisive factor for most, although 10.6% of students chose the National Open and Distance University (UNAD) due to their scores. This poses challenges for developing competencies in students with lower scores (Johnson et al., 2007).

Parental Education

Parental education is an important factor: 38.8% of students have parents with complete primary education, and 21.1% have parents with higher education. 63.5% of students are dependents, suggesting that they are young people with the availability to study, while 22.4% are mothers and 10.6% are fathers (Creswell & Plano Clark, 2018).

Family Influence and Academic Strengths

Additionally, the majority of students (61.2%) do not have children, while 38.8% do. This indicates that most students are women aged 20 to 27, focused on studying and working. 29.4% of aspirants were influenced by family members to study Public Accounting, while 70.6% made the decision independently, suggesting a genuine interest in the career (Galeano, 2004).

Academic Competencies

Finally, the areas of academic strength include mathematics (50%), computer science (17%), social sciences (9%), and psychology (5%). 55.3% of students have a low level of English, despite the National Open and Distance University (UNAD) offering four levels of English in its program, from A1 to B2, which is concerning for their professional development in a globalized environment (Altbach et al., 2009).

Analysis of the Applied Probit Probability Model

To create the probability model, the dependent variable used was the preference for choosing Public Accounting as the first choice. The explanatory variables included in the model were:

- Socioeconomic Stratum of the student
- Cost of Tuition at the National Open and Distance University (UNAD)
- Saber 11 Test Score
- Parents' Education Level
- Student's Age
- Area of Academic Strength

The calculations for the probability model were performed using the statistical software Stata, which is widely recognized for its ability to handle complex data and perform econometric analyses (StataCorp, 2021). Below is Table 1, which presents the estimation results of the Probit model.

Table 1. Probit Model Estimation Results

Marginal effects after probit
y = Pr(firs_choice) (predict)
= .58923552

variable	dy/dx	Std. Err.	z	P> z	[95% C.I.]	X
socioe~c	.1222695	.08377	1.46	0.144	-.041925	.286464		1.91463
tookin~t*	.3398215	.16287	2.09	0.037	.020599	.659044		.878049
scoret~o*	-.4112293	.15404	-2.67	0.008	-.713147	-.109311		.109756
parent~n	-.0755274	.03668	-2.06	0.039	-.147422	-.003633		2.64634
age_st~s	-.1231365	.06449	-1.91	0.056	-.249538	.003265		2.5
area_k~g	.0915006	.06342	1.44	0.149	-.032792	.215794		1.67073

(*) dy/dx is for discrete change of dummy variable from 0 to 1

Source: Self-Elaboration

The analysis of the model indicates that the decision to study the Public Accounting program at the National Open and Distance University (UNAD) is significantly influenced by the cost of tuition, with a positive coefficient. This finding, contrary to what is expected according to economic demand theory, could be explained by the high-quality accreditation of the National Open and Distance University (UNAD) and national government tuition-free programs, such as Generación E and Matrícula Cero, which cover costs for low-income students (Galeano, 2004; Wooldridge, 2010).

Another significant variable is the Saber 11 test score, which has a negative sign, indicating that higher scores decrease the likelihood of choosing the National Open and Distance University (UNAD). This suggests that students with better scores prefer more prestigious in-person universities, aligning with previous studies that relate academic capital with the choice of educational institutions (Creswell & Plano Clark, 2018; Johnson, Onwuegbuzie, & Turner, 2007).

Additionally, parents' education level was found to be a significant predictor, with a negative sign, indicating that higher parental education levels decrease the likelihood of students choosing this program. The student's age also emerged as a significant variable, with a negative sign, showing that the probability of studying in this program decreases with age, consistent with the characterization of the student population being between 20 and 27 years old (Tashakkori & Teddlie, 2010).

The regression model indicates that the student's socioeconomic stratum and the area of academic strength are not significant determinants in the choice of the program at the National Open and Distance University (UNAD).

The next step involved estimating the marginal effects of the probability model to determine the weight of the probability values for the selected explanatory variables.

Table 2. Marginal Effects of the Probit Model

Marginal effects after probit
 $y = \text{Pr}(\text{Primer_selecciprog})$ (predict)
 $= .58923552$

variable	dy/dx	Std. Err.	z	P> z	[95% C.I.]	X
Stratum	.1222695	.08339	1.47	0.143	-.041176	.285715		1.91463
You had in	.3398215	.14914	2.28	0.023	.04751	.632133		.878049
Your point	-.4112293	.14895	-2.76	0.006	-.703159	-.119299		.109756
Education	-.0755274	.03682	-2.05	0.040	-.147688	-.003367		2.64634
Age of	-.1231365	.06243	-1.97	0.049	-.245504	-.000769		2.5
With what are	.0915006	.06438	1.42	0.155	-.034691	.217692		1.67073

(*) dy/dx is for discrete change of dummy variable from 0 to 1

Source: Self Elaboration

The marginal effects of the model highlight that the variables with the greatest impact on the probability of choosing the program are the cost of tuition and the Saber 11 test score, followed by the student's age and socioeconomic stratum.

Analyzing prestigious global universities that offer Public Accounting programs, such as the London School of Economics, the University of Pennsylvania, and the University of Sydney, reveals that these institutions focus on teaching essential accounting skills and providing solid training in business and finance. Additionally, they have distinguished faculty and offer professional internship opportunities, giving graduates a competitive edge in the global job market (Harvey & Knight, 1996; Altbach, Reisberg, & Rumbley, 2009). These factors underscore the importance of relational and professional capital in employability and post-graduation professional success.

3. Discussion of results

The findings of this study align with several previous research studies, providing further evidence for the factors that influence students' decisions to pursue a Public Accounting career in a virtual modality. The predominance of female students in the program is consistent with the observations of Sarmiento Espinel and Silva Arias (2013), who found that 57% of accounting students in Colombia were women (535-reviewed). The significance of cost as a determining factor, especially due to tuition-free policies and external financing, supports the findings of Hernández et al. (2020), who highlighted the importance of scholarships and funding programs for low-income students. The negative relationship between Saber 11 test scores and the likelihood of choosing the virtual program at the National Open and Distance University is in line with Montesano and Zambrano's (2013) research, which suggested that students with higher scores tend to prefer more prestigious in-person universities. The influence of parental education

level on students' decisions also aligns with previous studies, emphasizing the role of family background in shaping educational choices.

However, this study also presents some contrasting findings. The positive coefficient for the cost of tuition, indicating that higher costs increase the likelihood of choosing the program, contradicts the traditional economic theory of demand. This discrepancy might be attributed to the high-quality accreditation of the National Open and Distance University (UNAD) and the availability of government tuition-free programs, which enhance the perceived value of the program despite its cost. The non-significance of socioeconomic stratum as a determinant in program choice challenges the findings of Montesano and Zambrano (2013), who identified socioeconomic level as an influential factor. The lack of significance for the area of academic strength also contrasts with the work of Villota Fonseca et al. (2019), who found a connection between students' aptitudes and interests and their chosen program.

To conclude, this study contributes to the existing literature on the factors influencing career choices in Public Accounting, particularly in the context of virtual education. The findings confirm some previous observations while also presenting new insights that challenge traditional assumptions. The study's implications for academic program design and educational policies are significant, highlighting the need to consider factors such as cost, academic performance, family background, and individual competencies when developing strategies to attract and retain students in Public Accounting programs. The study also underscores the importance of ongoing research to understand the evolving dynamics of career choices in this field and to adapt educational offerings to meet the changing needs and expectations of students.

4. Conclusions

The study provides valuable insights into the characteristics of students and the factors influencing their decision to enroll in the Public Accounting program. It highlights that 70% of the students are women and belong to socioeconomic stratum 2. Significant prior competencies were identified, such as a low level of English proficiency in 55% of the respondents. However, favorable results that facilitate academic performance were observed, with 63% of students demonstrating knowledge in mathematics and 80% having a medium-high level of ICT skills. This suggests that some students choose the Public Accounting program due to their prior knowledge in these areas, which simplifies their learning process and contributes to achieving desired outcomes.

Public Accounting in Colombia is a professional career that has evolved in response to market needs and government regulations. The programs offered by universities in Colombia provide comprehensive training in accounting, financial, and managerial skills, as well as ethics and social responsibility.

Furthermore, internationalization and the use of technologies, especially artificial intelligence, have become increasingly important in public accounting in Colombia. These advancements are crucial for staying up-to-date with global trends and competing in an international market highly influenced by new technologies.

When selecting a university to study Public Accounting, it is essential to research and compare the programs, reputation, and resources offered by these institutions. This enables making an informed decision aligned with the professional needs and goals of each student.

Finally, it is crucial to consider the cost of the program and the Saber 11 test scores as determining factors in the planning and management of the academic offerings in the Public Accounting program at the National Open and Distance University (UNAD) and other universities offering this course. This ensures better alignment with the students' expectations and capabilities, thereby promoting greater academic and professional success.

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