

Research Article

# Model for the Implementation of Graduate and Candidates for Graduates Tracking System at the American University, Nicaragua

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## Abstract

The main objective of the present research was to establish a model for the implementation of the monitoring of graduates and degree completers of the American University, Nicaragua, for which it was proposed to identify the theoretical basis for the model, describe the model then, and assess the importance that this has. From the above, we worked with a database from 1992 to 2022 in business administration and industrial engineering careers, totaling 832 graduates and degree completers, with a standard deviation of 0.5, a confidence level of 95% with  $Z=1.96$ , and a 5% error. Using the previous statistics, a sample of 191 graduates with a degree in Business Administration and 208 graduates with a degree in Industrial Engineering was established. According to the results obtained, it was concluded that it is pertinent to reorient some questions to obtain the perception results; Indicators are established for the quality and efficiency of the institution, in terms of recommending the American University as a home of study and the interest in supplementary studies, finally the importance of the implementation of a follow-up comprehensive model for graduates, which it has to carry out actions to improve academic quality.

## Keywords

Tracking of Graduates and Candidates for Graduates, Educational Quality, Comprehensive Model, Continuous Improvement

## 1. Introduction

Implementing a solid model for tracking graduates and candidates for graduates in higher education is essential to assess the impact of the educational institution on its students' professional and personal lives. The model aims to establish a continuous connection with graduates, allowing for the collection of valuable information on their job placement, professional development, and contribution to society. Re-

searching university graduates' academic and professional progress is essential for strategic planning according to [1]. Following with [1], this provides indicators of the relevance of programs and study plans and the design and development of university curricula.

In another study [2, 3], it is stated that quality management in universities should pursue several objectives: a) efficiency

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in the university's key functions, such as teaching, research, and engagement with society; b) alignment with the needs and dynamics of society; and c) a positive impact on the comprehensive and quality education of students, interdisciplinary research, and priority research areas, as well as on the economic, social, and political development of society and the institution's personnel (administrative staff, managers, faculty, and students).

As mentioned in the study [2], it universities should analyze and reflect on their current situation and environment and define their role within it. To achieve this, it is essential to promote an open and transparent dialogue among the various stakeholders, such as faculty, administrative staff, management, alumni, and representatives of society. This way, the perceptions and expectations of each group can be understood, and challenges and action plans can be formulated to improve the quality of education.

In [2], the Graduate Tracking and Support Model (SAG) is introduced as a contribution to the management of educational quality. This model emphasizes the importance of communication, systematization, and analysis of graduates' perceptions regarding the quality of the education they received. It has been observed that this positively impacts their professional performance and the development of professional competencies. Furthermore, the model contextualizes the relevance of higher education and generates the need for continuous training to promote the professional development of graduates in the economic, social, cultural, and technological spheres.

In this regard, it can be asserted that for the American University (UAM), continuous improvement is of great importance, as it is conceived as a curricular activity that provides valuable data to identify areas for enhancement in educational programs, adapting them to the changing demands of the labor market.

Employment placement serves as an indicator to understand the time and effectiveness with which graduates integrate into the job market, identifying potential obstacles and areas for support; an essential aspect for professional development, it gives insight into the professional growth of graduates throughout their careers, identifying success patterns and areas where UAM can continue to contribute to ongoing education.

Another aspect is the building of professional networks, which facilitates the creation and expansion of contacts between graduates and current students, offering opportunities for mentorship and collaboration; institutional feedback, promoting valuable information on the quality of the education received—helping the institution maintain high standards and adapt to the changing needs of society—and, most importantly, the contribution to the country, allowing graduates to give back to their community, strengthening the institution's reputation and its positive impact on the lives of Nicaraguans.

Based on the above, the question guiding this article is: How would the implementation of a monitoring model for graduates and candidates for graduates impact the continuous

improvement of the American University? In this regard, the general objective of this research is to establish a model for implementing the tracking of graduates and candidates for graduates of the American University up to 2023, in Managua, Nicaragua. To achieve this, the aim is to identify the theoretical basis for the graduate and candidates for graduates tracking model, thereby facilitating the description of the model for the establishment of tracking, and subsequently, to assess the importance of implementing such a model at the American University.

## 2. Material and Method

This research study was designed using the methodological approach of qualitative research, as it best fits the characteristics and needs of the study. Data collection was carried out using both closed and open-ended questions, and the survey was used as the instrument to describe the perception of graduates regarding the relevance of their professional education in the labor market insertion per the author [4].

The following steps were carried out:

### 2.1. Literature Review

An exhaustive review of academic literature related to the tracking of graduates in higher education institutions was conducted to identify theories, models, and methodological approaches previously developed for graduate tracking.

#### 2.1.1. Design of the Tracking Model

Based on the literature review, a theoretical framework was developed to support the graduate tracking model to be implemented at the American University. This framework considered key indicators to be used in evaluating the performance of graduates. One month period was allocated to define the regulations and model for tracking graduates.

#### 2.1.2. Validation of the Model

After adopting the UAM graduate tracking model, consultations with five experts in higher education and quality management were conducted to validate the proposed model. Adjustments were made according to the suggestions and feedback received during the validation process.

#### 2.1.3. Pilot Implementation of the Model

In this phase, a representative sample of graduates from the American University was selected to implement the tracking model. One week was spent defining the purpose of the survey and research question, another week to obtain the database of graduates, and two weeks to implement the instrument, which was executed between July and December 2023.

The primary sources were graduates from the databases of the Business Administration and Industrial Engineering programs. Inclusion criteria required that the graduates studied

between 1992 and 2022, specifically in the Business Administration and Industrial Engineering programs, which have been established for 30 years and have a high number of cohorts. The target population consisted of graduates from the first cohort up to the year 2022 in the aforementioned programs. The sample population included Business Administration and Industrial Engineering program graduates between 1992 and 2022.

## 2.2. Equations

The sample size to be obtained is the one developed in [5].

$$n = \frac{Z^2 \sigma^2 N}{e^2 (N-1) + Z^2 \sigma^2} \quad (1)$$

## 2.3. Tables

**Table 1.** Terms and Definitions of Graduate and Candidates for graduates Tracking Model.

Terms	Definitions
Mechanism for Tracking Graduates and Candidates for graduates for graduate	It is the process through which analysis and evolution are carried out after the completion of their studies and the beginning of their professional life [6].
Tracking Model	It is part of the mechanism for tracking graduates and candidates for graduates, defined as the form of the study that seeks to collect their perceptions regarding the education received, the importance of professional development, and the perception of employers regarding their education and performance [7].
Tracking Graduates and Candidates for graduates for graduate	A set of activities that the institution develops to promote curricular feedback, measure the performance of its graduates, job placement, and design postgraduate and specialization courses, including the existence of communication mechanisms between the institution and its graduates [8].
Graduate/Candidates for graduates for graduate	A person who has completed and passed all the subjects of the corresponding study plan fulfilled the requirement of preparing and defending a monograph or thesis, taken a final exam, or met another degree completion requirement defined by the respective higher education institution. [8]
Employer	In the context of this research, the employer is defined as an individual entity or organization that can offer job positions to graduates and candidates for graduates based on a set of cognitive and attitudinal requirements [9].
Labor Market	It is the conjunction of the supply and demand for employment for graduates and candidates for graduates of American University [9].

Descriptive table of terms.

## 3. Theoretical Foundation

The tracking of graduates from the American University aligns with the National Higher Education Plan 2023-2026, the Strategic Framework for Higher Education, and the Verification Manual for Obligations as outlined in Article 10 of Law 704, which establishes the National System for Quality Assurance of Education and regulates the National Council for

Where:

$n$  = the sample size to be obtained

$N$  = the total population size

$\sigma$  = the population standard deviation. If this data is unknown, it is common to use a constant value equivalent to 0.5

$Z$  = the value obtained through confidence levels. Its value is a constant, typically two values are used depending on the desired confidence level, with 99% being the highest value (equivalent to 2.58) and 95% (1.96) being the minimum value accepted to consider the research reliable.

$e$  = the acceptable limit of sampling error, generally ranging from 1% (0.01) to 9% (0.09), with 5% (0.05) being the standard value used in research.

Evaluation and Accreditation [10-12, 8].

Continuous and systematic evaluation of university institutions is vital for fostering innovation, identifying new teaching methods, and optimizing resources. In this context, graduates tracking studies are crucial as they gather insights on professional performance, feedback on educational quality, and emerging labor market demands. These studies create a reciprocal relationship between institutions and graduates, benefiting all stakeholders, including institutions, the com-

munity, graduates, and current students. Their primary aim is to enhance educational quality and address relevant issues [13].

Regarding the challenges of the knowledge society, Gaspar Domingos, Capó Pérez, and Lombillo Rivero argue that universities' primary mission is to generate, preserve, and disseminate human, scientific, and technological knowledge to address societal demands. This must be accomplished sustainably and integrally, upholding ethical, moral, and cultural principles, as well as national values [14]. The purpose of tracking graduates and alumni is to promote -through the different academic units of the university- the integration relationships between alumni and the university. Constant and ongoing engagement with representatives of the alumni associations from the various academic and administrative bodies of the university is important for coordinating the diverse activities related to alumni. [15, 13, 6].

The literature highlights the importance of graduate tracking systems as a key tool for obtaining information on their performance in the workplace. Additionally, these mechanisms allow companies to provide valuable feedback on the relevance and effectiveness of the curriculum in preparing graduates for the demands of their respective industries [16-18].

Likewise, it is considered that tracking graduates and alumni serves a dual purpose: first, it provides self-awareness for the academic institution to make the necessary adjustments and changes to strengthen improvement actions; and second, it generates the essential elements for resource allocation for tracking programs, knowing that the institution with greater knowledge is the one that produces the most significant impacts on its students and society.

#### *Integral Model*

The review of relevant literature indicates that an integrated approach to tracking graduates is essential, as it enables the university to positively influence both the academic and professional community. The American University, committed to the holistic development of its students and their professional trajectories, has adopted such an integrated model. This approach recognizes the complexity of social processes and the necessity to address them from multiple perspectives.

According to the Inter-agency Network for Education in Emergencies, "an integrated approach allows two or more sectors to work together to achieve one or more common program outcomes, based on capacities and the joint identification and analysis of needs" [19]. This perspective aims to leverage the strengths and capabilities of various sectors to effectively address identified needs.

An integral model should be inclusive and comprehensive, incorporating multiple perspectives to provide a holistic view. "Being an integral approach, it will include the maximum number of styles and methodologies possible in a coherent vision of reality" [20]. This suggests that the nature of such an approach transcends a single methodology, striving to integrate diverse perspectives for a complete understanding of the

context.

## 4. Results and Discussion

Based on the theoretical framework, the following terms have been identified to aid in understanding the mechanisms for tracking graduates and candidates for graduates of the American University. (Table 1)

As part of the mechanisms, the Regulations and Tracking Model for UAM Graduates has been developed by the team from the Department of Research and University Extension in collaboration with the Academic Directorate of the American University. The procedure was studied, evaluated, and agreed upon.

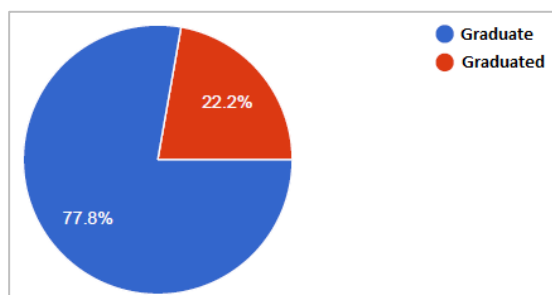
### 4.1. Sample for Validation

The instrument was formulated with the following aspects to understand: demographic data, current job, relationship between the field of study and current job, and application of studies and training, within the national and international context. For a better analysis, only the most relevant results will be considered. In this sense, the universe to work with as a test to validate the model of tracking graduates and candidates for graduates for graduates are the professionals who graduated and candidates for graduates in the period 1992-2022 from the careers of business administration and industrial engineering. These are N=832 graduates and candidates for graduates from business administration N=380, and engineering N=452. Since the standard deviation is unknown, 0.5 is assumed for a confidence level of 95%, with  $Z=1.96$  according to the statistics table; with a 5% standard error sample value. The sample to be tested for each career is N=191 business administration graduates and N=208 industrial engineering graduates. For the validation of the instrument applied in the tracking of graduates and candidates for graduate from the American University, a total of N=399 graduates and candidates for graduate were surveyed, of which only 45% responded: N=86 business administration graduates and candidates for graduates and N=94 industrial engineering graduates and candidates for graduates.

#### *The following results were obtained:*

In the survey, N=130 (72.2%) of respondents are women and N=50 (27.8%) are men. The majority, N=150 (83.3%), are between 21 and 30 years old, while N=30 (16.7%) are between 31 and 40 years old. Ethnically, N=120 (66.7%) identify as mestizo, and N=20 (11.1%) as Chorotega-Nahuas-Managua, with N=40 (22.2%) not reported. Geographically, N=140 (77.8%) are from Managua, N=20 (11.1%) from Carazo, and N=40 (22.2%) from other departments. Regarding education, N=140 (77.8%) are graduates, and N=20 (22.2%) are graduation candidates, with specific percentages for various graduation years. There is no available data for graduates or candidates before 2006.

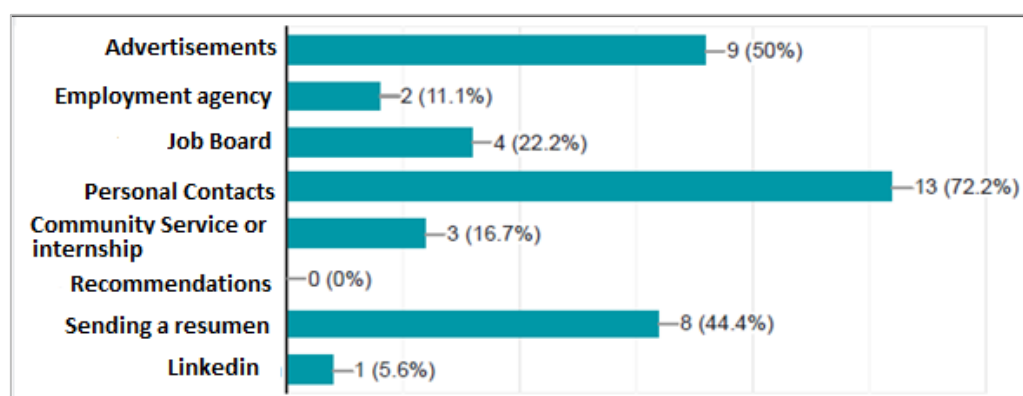
#### *Item: Demographic Data*



**Figure 1.** Percentage of graduates and candidates for graduates.

In the survey regarding current employment, N=102 (56.6%) of respondents reported having regular jobs. Meanwhile, N=68 (37.8%) have sporadic jobs, multiple positions, or roles in service and management, while N=10 (5.6%) are unemployed due to low salaries, lack of experience, or limited opportunities. To seek employment, N=90 (50%) used advertisements, N=20 (11.1%) relied on employment agencies, N=40 (22.2%) utilized the UAM job board, and N=30 (16.7%) sought opportunities through social service or internships.

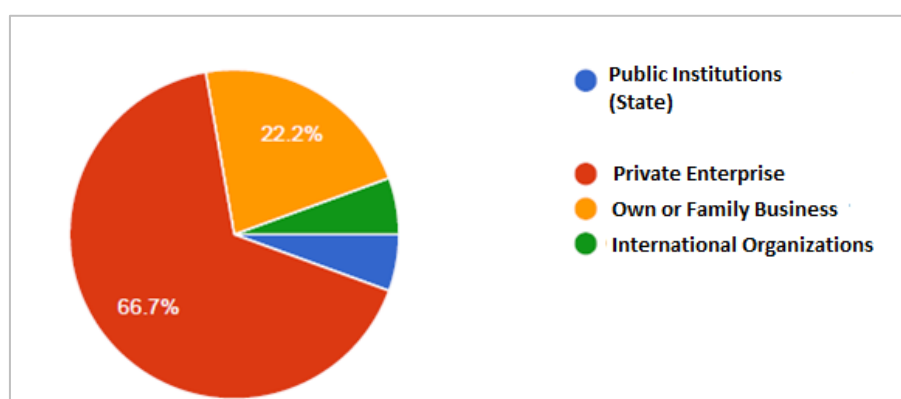
*Item: Current Job*



**Figure 2.** What methods did you use to seek employment?

In the study, N=102 (56.6%) of employed respondents found jobs within 3 to 8 months after graduating, while the rest found employment after more than 8 months. Half of the participants reported having worked after completing their studies, while the other half had not. Regarding employers,

N=120 (66.7%) indicated they were employed by private companies, N=40 (22.2%) by their own or family businesses, and the remainder by government or international organizations.

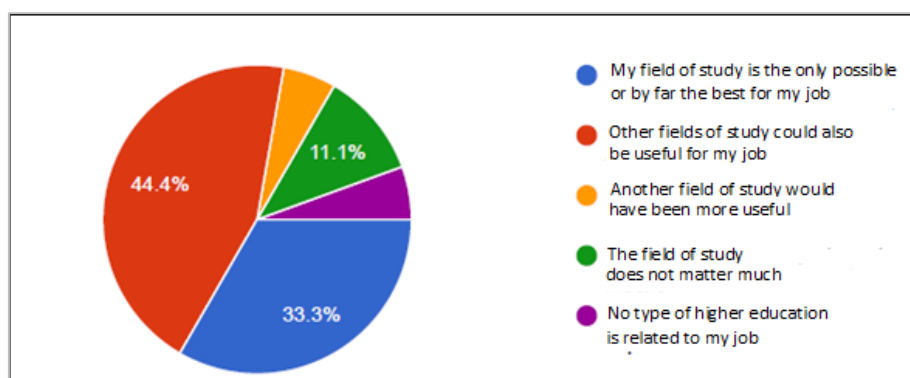


**Figure 3.** Specify the type of current main employer/institution.

Regarding the relationship between field of study and current job, N=80 (44.4%) of respondents noted that other fields could also be applicable for work. Meanwhile, N=60 (33.3%) believed their field of study is the only suitable option, and

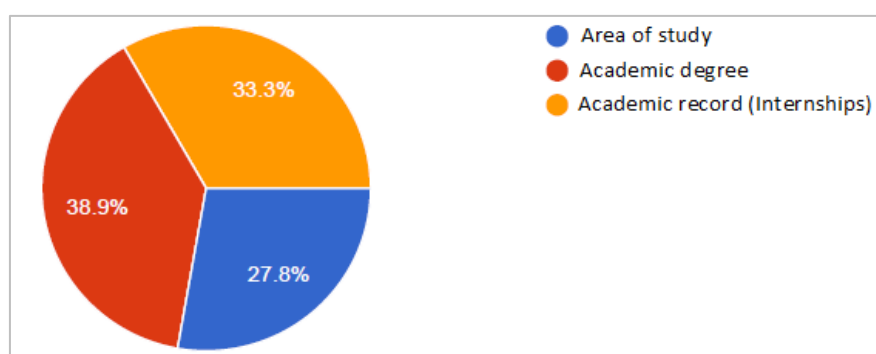
N=20 (11.1%) stated that their field does not influence their job search. The remaining N=20 (11.2%) felt that different fields might serve them better, as their profession does not align with their current work.



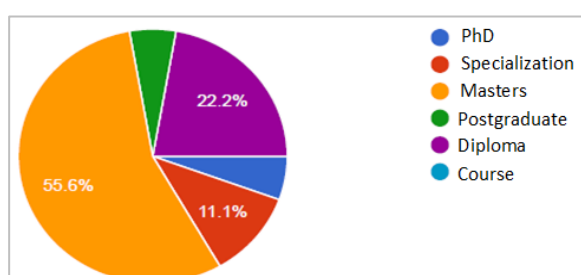


**Figure 4.** Characterization of the relationship between field of study and current area of work.

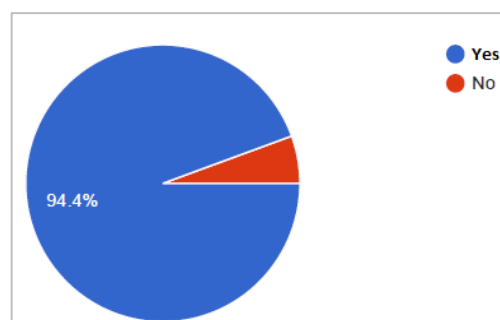
Regarding factors that aided in finding employment, N=70 (38.9%) of respondents cited their academic degree as favorable, N=60 (33.3%) pointed to their academic record, and N=50 (27.8%) highlighted the importance of internships.



**Figure 5.** Which aspect do you consider favored the most when obtaining employment?



**Figure 6.** Interest in Supplementary Studies.



**Figure 7.** Would you recommend studying at UAM?

In response to the question about interest in supplementary studies, N=130 (72.2%) of respondents expressed significant interest, while N=50 (27.8%) showed low interest. Regarding the types of supplementary studies, N=100 (55.6%) identified a master's degree as the most relevant, N=40 (22.2%) preferred diplomas, N=20 (11.1%) favored specializations, and the rest considered doctorates and free courses important. Additionally, N=170 (94.4%) of respondents would recommend studying at UAM as an educational institution.

## 4.2. Model for Tracking Graduates and Candidates for Graduates

The model for tracking graduates and candidates at Universidad Americana (UAM) is crucial for enhancing academic management and continuous improvement. It provides feedback on the relevance of education, supports the formulation

of policies and curricula, and ensures quality education for current and future professionals. Implementing this Graduate Tracking Model will help adapt curricula and improve job placement for UAM graduates, benefiting both the graduates and the university.

Additionally, UAM can use the graduate tracking model to evaluate its graduates' professional relevance and employability. This assessment helps graduates connect with the labor market, promoting their professional growth [17, 2].

## 5. Conclusions

The mechanisms for tracking graduates and candidates at Universidad Americana (UAM) align with the institution's quality policy and assurance model, serving as evaluation tools within self-assessment and program evaluation processes guided by improvement plans. This framework establishes a systematic approach to evaluate and track graduates, leading to defined improvement actions.

A survey conducted via Google Forms assessed the relevance of educational experiences among graduates of the Business Administration and Industrial Engineering programs. Some questions were found to need reorientation for better insight in future evaluations across different programs.

Key indicators emerged from the results, including that N=170 (94.4%) of respondents would recommend UAM, and N=130 (72.2%) expressed interest in supplementary studies, such as master's degrees and specializations. The implementation of this tracking model enhances UAM's self-awareness as a higher education institution, enabling authorities to improve academic quality and support initiatives that enhance professional training for graduates.

## Abbreviations

UAM American University

## Author Contributions

**Victor Rogelio Tirado Picado:** Conceptualization, Writing – original draft

**Erick Navarrete-Orozco:** Writing – original draft

**María Elieeneht Mejía-Ponce:** Writing – review & editing

**Roxana Guerrero-Guillén:** Conceptualization & review

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## Conflicts of Interest

The authors declare no conflicts of interest.

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