Prevalence and probability between “attending and availability” in university business clinics

Diego Alejandro López Ordoñez
Doctorando en Administración de Empresas-Universidad de la Salle
Magister en Docencia.
Docente ocasional de tiempo completo de la Universidad Colegio Mayor de Cundinamarca. Bogotá, Colombia.
diegoalejandrolopez@unicolmayor.edu.co; https://orcid.org/0000-0003-2149-3492

Jairo Jamith Palacios Rozo
Magíster en Educación
Doctorando en Socioformación y Sociedad del Conocimiento – CIFE.
Docente de Planta de la Universidad Colegio Mayor de Cundinamarca. Bogotá, Colombia.
jjpalacios@unicolmayor.edu.co; https://orcid.org/0000-0002-1437-9838

Lugo Manuel Barbosa Guerrero
Magíster en informática Educativa.
Docente de planta de la Universidad Colegio Mayor de Cundinamarca. Bogotá, Colombia.
lmbarbosa@unicolmayor.edu.co; https://orcid.org/0000-0002-0871-8637

Abstract

There are studies regarding university business consultancies, but in this case there is a need to know the prevalence of the question or the lack of knowledge regarding the probability of a difference and an informative factor. The purpose of the present study was to determine the prevalence of the question and the probability of a difference or informative factor. This data is from the “Business Consultancy - UNICOLMAYOR” which provides information on the questions: Bayesian contingency table for the relationship of the questions. Are you available to receive the advice on Saturdays at the established time? against the question: Is this the first time you have attended the UCMC Business Consultancy? by the business consultancy of the Universidad Colegio Mayor de Cundinamarca - Unicolmayor”, from the clinic's advisees to questions posed by two constructed identities [i.e., First time attending the clinic (Yes, No) x Availability to receive advice (Yes, No)]. 570 potential advisors participated, completing an online survey divided into sections such as characterization, business sector, geographic and financial. The Log Odds Ratio plots analyze the effect that the relationship of qualitative variables has on others that are dichotomous, used for retrospective experimental designs, that is, for those in which what happened is already known and which usually have a cross-section. The prevalence of the question: Is this the first time you have attended the UCMC Business Clinic? versus the question: Are you available to receive advice
on Saturdays at the established time? The Odd ratio with a confidence interval, which concludes that it is ten times more likely that there is a difference than there is not, and a smaller Bayes factor that is also informative.

**Keywords:** Prevalence, probability, university business clinic

### Introduction

In the dynamic and increasingly competitive globalized market, university business consultancies take a leading role, where they advise entrepreneurs and microentrepreneurs, often on innovative and circular economy projects. The breakthrough of the circular economy has been achieved through innovations, digital solutions, smart regulation, and responsible investors, businesses and consumers. (Lazarevic et al., 2022). So these factors are driving the development of the circular economy, thus promoting efficiency in companies.

The business clinics aim to provide advice and comprehensive attention aimed at the business area, and at the same time allow strengthening the educational skills of the students and teachers in charge through an academic training space. (Alvear - Pájaro, 2022). Business clinics at universities are a great comprehensive benefit that ranges from enriching students education to supporting entrepreneurs and business owners, supporting economic development and strengthening business activity.

University Entrepreneurship today is a term used in the business field; Universities are the seedbeds where ideas are created and developed, where students acquire knowledge and entrepreneurial training that will allow them to be the main actors in this discipline that contributes to the construction of a better future, generating Socioeconomic Impact through the management of entrepreneurial initiatives. (Lechuga - Nevárez, et al., 2022)

The restructuring of students practice scenarios in order to operationalize the Entrepreneurship Unit, as an initiative to strengthen the institutional model of social projection. UNICOLMAYOR (2020). It is clear that, in this context, entrepreneurs and businessperson have found a valuable source of support in university business clinics, where they are offered specialized consulting, which is why they should think about restructuring the services they provide.

One of the fundamental factors for the success of any business support program is the active attendance of businessperson and entrepreneurs at these clinics. However, assistance can be influenced by a number of factors and one of the most notable is the availability of resources and services offered by these business practices. Advice and consulting are currently emerging as first-rate tools in the business world, the complexity of markets and the urgent need to increase their levels of competitiveness make these services a timely package to add value to businesses. (Álvarez Contreras & Jiménez Lyons, 2020).

It is important to carry out research on the connection between the attendance of entrepreneurs and microentrepreneurs at university business clinics and the availability of resources in these centers. The reason is that this relationship can have highly relevant consequences for both business development and economic growth in general. There are many universities not only in Colombia but throughout the world that have been betting on training not only their students but also microentrepreneurs, as a way to strengthen the entrepreneurial spirit. (Romero Garibello et al., 2022)

Consulting not only provides external knowledge, but also collaborates in the development of internal capabilities, which provides significant value to universities in their search for effective knowledge management. The knowledge evolution cycle has allowed us to value consulting as a source of value to manage knowledge in organizations; As a gradual process of knowledge, until the transfer of its contributions and skills, it constitutes a recursive cycle. (Argota Pérez et al., 2022)
Organizational transformation processes require, from the perspective of university research projects, differentiated levels of commitment, impact and results. (Morales et al., 2015). The above shows that there is a concern to critically evaluate the value and impact of consulting interventions in the transformation of organizations. This drives organizations to more rigorously consider how consulting firms contribute to their change and development objectives.

We postulate that consulting can be motivated by income considerations, the desire to commercialize inventions or the intention to generate research opportunities. (Perkmann & Walsh, 2008), likewise, individuals or entities may engage in consulting for various reasons, ranging from the search for additional income to the desire to take advantage of inventions or foster research opportunities.

Relationships are strengthened between universities and companies through business consultancies, having a significant impact on education, innovation and the economy. Therefore, they must always be an object of study. In recent years, university–industry relationships have been extensively studied by academic researchers and have often been debated by policymakers. (Bodas et al., 2013)

In the relationship between competitive funding for research and academic consulting, there seem to be two conflicting logics at work. (D’Este et al., 2013), there could be a contradiction here because universities can expect professors to obtain funding for research projects but at the same time provide consulting services generating a tension between these two logics in the academic and research field.

Within consultancies, projects are sometimes generated to support some entrepreneurship, what is known as business incubators, this is how university business consultancies end up promoting innovation and business development. Business incubators seek to develop innovative ideas that in turn will contribute to finding new projects or developing and expanding upon existing projects. (Muslim Saraireh, 2021).

University business clinics play an integral role in supporting entrepreneurs or microentrepreneurs, that is why it is good that they are not limited only to technical advice, they must strengthen support for the incubators so that the projects can be implemented.

Business consultancies can also collaborate in the generation of innovative ideas, in the development of prototypes and in the validation of business models, always seeking to promote creativity and entrepreneurship. (U de Colombia, 2022)

Finally, the dynamics of university business consultancies have a great implication for business development, the formulation of policies and programs that tend to promote entrepreneurship and business development.

Methodology

The objective of the research is to compare important management factors that entrepreneurs or microentrepreneurs may have, who take training in university business clinics, carrying out a comparison between 323 entrepreneurs and businessperson, they completed the questionnaire that was applied to them through convenience sampling, which is a representative sample, the questionnaire was divided into sections as a characterization.

This topic was part of an extensive investigation about the prevalence and probability between “attendance and availability” that is included in the relationship between microentrepreneurs and university business clinics, using a random selection method to finally obtain the total sample.

For the next phase, the entrepreneurs and microentrepreneurs were contacted by email, where they were instructed to completely fill out the questionnaire shared online. The questionnaire covered questions, which included: basic characteristics of the respondents such as their general information about each other and the person’s gender.
Managing to compile a total of 323 completed questionnaires (100%), answering the questions of: Is the first time you have attended the UCMC Business Clinic?

Are you available to receive advice on Saturdays during the established hours?

Finally, contingency tables were used in order to analyze the relationship between the categorical variables, and then apply Chi-Squared tests and thus be able to define if there are significant associations between these variables. The Vovk-Sellke Maximum p-Ratio measure was used to determine the strength of the variables and their relationship. In addition to being able to calculate the p value. The analysis of contingency tables and the Chi-Squared Tests. Y Vovk-Sellke Maximum p -Ratio: Based the p -value, the maximum possible odds in favor of H₁ over H₀ equals 1/(−e p log(p )) for p ≤ .37 (Sellke et al., 2001).

Results

Table 1 shows the summarized data, where the highest response rate observed was for the female gender with 911,000 advised, of which 68.93% (628,000) correspond to entrepreneurs and 31.06% (238,000) to businessmen. Following is the male gender with a total of 522,000 advised, of which 60.53 % (316,000) are entrepreneurs and 39.46% (206,000) are businesspeople.

Table 1 Type of advisor – Entrepreneur - Businessperson

<table>
<thead>
<tr>
<th>TYPE OF ADVISOR</th>
<th>ENTREPRENEUR</th>
<th>BUSINESSPERSON</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEMALE Count</td>
<td>628,000</td>
<td>283,000</td>
<td>911,000</td>
</tr>
<tr>
<td>Expected count</td>
<td>600.128</td>
<td>310.872</td>
<td>911,000</td>
</tr>
<tr>
<td>MALE Count</td>
<td>316,000</td>
<td>206,000</td>
<td>522,000</td>
</tr>
<tr>
<td>Expected count</td>
<td>343.872</td>
<td>178.128</td>
<td>522,000</td>
</tr>
<tr>
<td>Total Count</td>
<td>944,000</td>
<td>489,000</td>
<td>1433,000</td>
</tr>
<tr>
<td>Expected count</td>
<td>944.000</td>
<td>489.000</td>
<td>1433.000</td>
</tr>
</tbody>
</table>

Table 2 shows the data summarized in a contingency table. Finally, it can be observed regarding the variable studied, type of advisee, that 65.87% (944,000) correspond to Entrepreneurs and 34.12% (489,000) correspond to Entrepreneurs of the total sample of 1,433,000 advisees. Below is the data summarized in a gender frequency table. The highest response rate observed was that of the female gender with 72% corresponding to 408 frequencies, while the male gender has 28.42% with 162 frequencies for a total of 570 frequencies, adding up to 100% total. Below is the data summarized in a frequency table by stratum. The highest response rate observed is in stratum 2 with 279 frequencies corresponding to 48.9%, where it is almost half of the total data, followed by stratum 1 with 25.7% corresponding to 147 frequencies. In turn, stratum 3 has 120 frequencies with 21% of the total.

The data is shown summarized in a frequency table for the question: Is the first time you have attended the UCMC Business Clinic?

The highest response rate observed is YES with 386 frequencies corresponding to 67.7%, followed by NO with 32.3% corresponding to 184 frequencies, for a total of 570 frequencies corresponding to 100%. The highest
response rate observed is YES with 386 frequencies corresponding to 67.7%, followed by NO with 32.3% corresponding to 184 frequencies, for a total of 570 frequencies corresponding to 100%.

Table 2 Bayesian Contingency Tables

<table>
<thead>
<tr>
<th>Is the first time you have attended the UCMC Business Clinic?</th>
<th>No</th>
<th>Yes</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>10,000</td>
<td>174,000</td>
<td>184,000</td>
</tr>
<tr>
<td>% within row</td>
<td>5.435%</td>
<td>94.565%</td>
<td>100.000%</td>
</tr>
<tr>
<td>% within row</td>
<td>21.739%</td>
<td>32.206%</td>
<td>32.2810%</td>
</tr>
</tbody>
</table>

Table 3 shows the data summarized in a frequency table for the question: Are you available to receive advice on Saturdays at the established time? The highest response rate observed is YES with 534 frequencies corresponding to 91.9%, followed by NO with just 8.0% corresponding to 46 frequencies, for a total of 570 frequencies corresponding to 100%. The summarized data is shown in a Bayesian contingency table for the relationship of the questions. Are you available to receive the advice on Saturdays at the established time? against the question: Is this the first time you have attended the UCMC Business Clinic? The highest response rate observed is YES to the question: Are you available to receive advice on Saturdays at the established time? with 94.56% with a count of 174,000, while 5.4% expressed NO corresponding to 10,000 of 184,000 of the total. To the question: Is this the first time you have attended the UCMC Business Clinic? Summary data from the Bayesian contingency tables test are shown with the following results. The independent multinomial value gave 0.212 for a population of 570.

Table 3 Bayesian Contingency Tables Tests

<table>
<thead>
<tr>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BF10 Independent multinomial</td>
</tr>
<tr>
<td>Value</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>N</td>
</tr>
<tr>
<td>570</td>
</tr>
</tbody>
</table>

Note. For all tests, the alternative hypothesis specifies that group No is not equal to Si.

For example, a Bayes factor of 0.1 (1/10) indicates that it is ten times more likely that there is no difference than there is a difference. In this study the BF01 gave 4.724

Log Odds Ratio Plots: Is your first time attending the UCMC Business Clinic? - Are you available to receive advice on Saturdays during the established hours?

![Log Odds Ratio Plots](image)

Log Odds Ratio plots allows us to analyze the effect that the relationship between qualitative variables has on others that are dichotomous. This is used for retrospective experimental designs, that is, for those in which what happened is already known and which are usually cross-sectional. In this case, the aim is to know the prevalence of the question: Is this the first time you attend the UCMC Business Clinic? versus the question a) you are available to receive advice on Saturdays during the established hours? with the following results obtained. The Odd ratio gave -0.549 with a 95% confidence interval between -1.263 and 0.165. The BF10 gave 0.212 which means it is ten times more likely that there is a difference than there is not. A Bayes factor less than one (1) is also informative.

**Conclusions**

The study determines that the “Business Consultancy - UNICOLMAYOR” which provides information on the questions: Bayesian contingency table for the relationship of the questions: Are you available to receive advice on Saturdays during the established hours? against the question Is this your first time attending the UCMC Business Clinic? by the business clinic of the Universidad Colegio Mayor de Cundinamarca - Unicolmayor”, from the clinic’s advisees to questions posed by two constructed identities [i.e., First time attending the clinic (Yes, No)]
Availability to receive advice (Yes , No)]. In the contingency table, the highest response rate observed is of the female gender with advisees of whom correspond to entrepreneurs and businessmen, followed by the male gender with advisees of which are entrepreneurs and businessmen.

The variable studied type of advisee with the highest percentage corresponds to entrepreneurs, followed by businessmen for the total sample of advisees, in a gender frequency table the highest response rate observed was that of the female gender followed by the male gender. for the question: Is this the first time you have attended the UCMC Business Clinic?

The highest response rate observed is YES, followed by NO, for a total frequency corresponding to one hundred percent. The data from the frequency table for the question: Are you available to receive advice on Saturdays at the established time? The highest response rate observed is YES, followed by NO for a corresponding total of frequencies. The data in the Bayesian contingency table for the relationship of the questions: Are you available to receive advice on Saturdays during the established hours? against the question: Is this the first time you have attended the UCMC Business Clinic? The highest response rate observed is YES to the question, are you available to receive advice on Saturdays during the established hours? with a higher count, while those who expressed NO corresponding to the question: Is this the first time you attend the UCMC Business Clinic? the data from the Bayesian contingency tables test where it returns the independent multinomial value for a population.

The Log Odds Ratio plots analyzed the effect that the relationship of qualitative variables has on others that are dichotomous, used for retrospective experimental designs, that is, for those in which it is already known what will happen and which usually have a cross section. The prevalence of the question: Is this the first time you have attended the UCMC Business Clinic? versus the question: Are you available to receive advice on Saturdays at the established time? The Odd ratio with a confidence interval, which concludes that it is ten times more likely that there is a difference than there is not, and a smaller Bayes factor that is also informative.

References