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Correlation of subjective and objective factors that affect the academic performance in the Banking and Finance major

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ABSTRACT

To correlate the subjective and objective factors that affect the academic performance of students in the Banking and Finance major at the Facultad Regional Multidiciplinaria de Carazo (FAREM-Carazo) UNAN-Managua, in the 2011-2015 period, an observational, correlational and analytical study is presented. A study which is traditionally analyzed only as a descriptive study. By applying the nonparametric statistical tests V of Cramer, Tau – Kendall´s C and Phi, the evolution of the study is facilitated. Considering as a primordial factor, the nature of the variables to possess a well-defined statistical structure; in addition to have clear premises to construct the correlation or association among the variables, these premises must be written in the form of hypotheses, which guide the purpose of the study.

1. INTRODUCTION

The various theorists who have studied academic performance from different perspectives, approaches, states (social, economic, cultural, political, and educational) of the direct actors have agreed that their significance is multicausal or multifactorial, covering all dimensions studied. Therefore, to evaluate it, you need to examine all the factors that affect it.

For analytical purposes, this study describes some conceptions of researchers who have studied the factors that incurring academic performance and that is also taken up into the study.

Olaz (2003, cited by Baquero et al, 2006) says that:

> Vocational interests are defined as patterns of likes, aversions, and indifferences regarding activities and occupations related to a major. Likewise, the process of vocational development includes a reciprocal model in which self-efficacy and expectations of results influence interests. People are likely to have enduring benefits in activities in which they consider themselves competent and in which they anticipate positive results. The interests determine in turn the intentions and goals to be set by the subject, which in turn decide the choice of specific activities and their subsequent practice (p.42).

It is necessary to stand out, that to form these habits it is evident that the exercise to be every day, considering a regular hour. In the formation of patterns, training is necessary; but practice does not lead to learning. Knowing if what you do is right or wrong, encourages the individual to modify their behavior to be more efficient in their study. To get to form study habits, is necessary to have psychological, environmental and instrumental main factors.

In Robledo and García (2009) it is described that "the economic and social disadvantages have adverse effects on the cognitive, socio-emotional, and school development of children" (p.118). They also add, "that family income can indirectly influence in the low performance of the students due to the scarce opportunities of interaction with stimulating environments that they have, to the limitation of resources or the conflicts derived from this economic scarcity" (pp.118-119).

Zabalza (2011) mentions that methods contain four basic dimensions such as the organization of spaces and times, the mode of information supply, the orientation and management of learning activities and interpersonal relationships.

Speaking of didactic methodology, in addition to methods, is also dealing with educational strategies. In the Modelo Educativo Normativa y Metodología para la Planificación Curricular of the Universidad Nacional Autonoma de Nicaragua (UNAN-Managua) are some teaching strategies that help teachers in their methodological practice, under the paradigm that they are focused on the student. Contextual Location, questioning guides on what is learned, Self-reflective observation, Collaborative learning, Case studies, Learning by projects, problem-solving Learning, Analytical-reflective written report, Fieldwork, Conferences masterly (pp. 38-40)

2. MATERIALS AND METHODS

By the research method, the present study is **observational**, according to the purpose of the methodological design, the type of study is **descriptive** (Piura, 2006). According

to Hernández, Fernández, and Baptista´s (2006) classification, the kind of education is **correlational**. According to the scope of the results, the study is **analytical** (Canales, Alvarado and Pineda, 1996).

Based on the data that was collected by applying a survey to all the fifth year of the active Banking and Finance major students within the 2011-2015 cohort, equivalent to 39 students, the corresponding database was designed, using the statistical software SPSS, v. 20 for Windows. Once the registered data quality control the has been carried out, the appropriate statistical analyses will be carried out.

For Pedroza et al (2006), the statistical methods used for the analyzes are:

Measures to Association for two dichotomous variables in contingency tables.

Phi coefficient: is a degree measurement of association between two dichotomous variables, based on the Ji statistical- Pearson´s square, which takes values between 0 and 1. Values close to 0, indicate **no** association between variables and values close to 1, will show a strong relationship. Similar to Chi-squared, it is constructed from the differences between the observed and expected frequencies, only that Phi takes values between 0 and 1, in 2x2 tables (page 46).

Measures to Association for two variables in nominal scale

V de Cramer is another extension of the Phi Coefficient, adjusted to the case that at least one of the two present variables in more than two categories, which differ from the Contingency Coefficient, takes values between 0 and 1, not depending on a higher bound. However, Cramer's V tends to underestimate the association degree between the variables. Values of Cramer's V, close to 0, will indicate **no** relationship between the variables, and values close to 1 will show a strong association (p 48).

Measures to Association for two variables in ordinal scale

Kendall's Tau-b test and Kendall's Tau -c: *Kendall's Tau -b* is an extension of the Gamma test, in the sense that both the low situation to which it can be applied and its interpretation, is the same. Although, it there is a disadvantage that these values can only be reached when the contingency table is squared (2x2, 3x3, 4x4, etc.).

Tau -c Kendall is a correction of Kendall's Tau -b, in the case of contingency tables that contain variables with a different number of categories. Compared to Tau -b, the Tau -c test has the advantage of being able to reach the values of -1 and 1 when the number of categories of the two variables is different. However, it has the disadvantage of underestimating the right degree

of association between the variables. This test is essential for analyzing "Likert" variables (page 51).

3. RESULTS

The following data are the results of the different statistical tests applied to various subjective and objective variables found in the study population. With these tests, the correlation or association between them was determined. In each of the correlations or associations between variables, we proceed to propose a null hypothesis to contrast their relationship.

The contingency analysis was done for the variables **which is your method of independent study (I visit the library)** and **the students' origin**. The Cramer analysis performed provided the evidence of ***p = 0.324***, indicating a **non-significant statistical response**. This result shows that the factors under study do not show an association with each other, in this case, it means that the method of independent study of the students is not associated with the origin of them.

		Value	Approx. Sig
Nominal by nominal	V de Cramer	.240	.324

The contingency analysis was carried out for the variables **which is your method of independent study (Internet use)** and the **students' origin**. The Cramer´s analysis, provided the evidence of ***p = 0.173***, indicating a **non-significant statistical response**. This result shows that the factors under study do not show an association with each other, in this case, it means that the method of independent study of the students is not associated with the origin of them.

		Value	Approx. Sig
Nominal by nominal	V de Cramer	.300	.173

The contingency analysis was carried out for the variables **which is your method of independent study (Internet use**) and the **student´s average family income**. The Cramer´s analysis, provided the evidence of ***p = 0,744***, indicating a **non-significant statistical response**. This finding shows that the factors under study do not show an association with each other, in this case, it means that the method of independent study of the students is not associated with their average family income.

		Value	Approx. Sig
Nominal by nominal	V de Cramer	.194	.744

The contingency analysis was performed for the variables **where you access the Internet for independent study (in a cyber)** with **average family income**. The Cramer´s analysis carried out, provided the evidence of ***p = 0,843***, which indicates a **non-significant statistical response**. This result shows that the factors under study do not have an association with each other, in this case, it means that the place where the Internet is accessed for independent study is not associated with the family average.

		Value	Approx. Sig
Nominal by nominal	V de Cramer	.158	.843

The contingency analysis was carried out for the variables **study frequency in a group manner** and **the students' origin**. Kendal 's Tau-C analysis provided the evidence of ***p = 0.889***, which indicates a **non-significant statistical response**. This result shows that the factors under study do not correlate with each other, in this case, it means that the study frequency in a group is not correlated with the origin of the students.

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig
Ordinal by ordinal	Tau-c de Kendall	.016	.113	.140	.889

The contingency analysis was performed for the **frequency of class attendance** and **average family income**. Kendal 's Tau - C analysis provided the evidence of ***p = 0,300***, which indicates a **non-significant statistical response**. This result shows that the factors under study do not correlate with each other, in this case, it means that the frequency of class attendance is not correlated with average family income.

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig
Ordinal by ordinal	Tau-c de Kendall	-.081	.078	-1.036	.300

The contingency analysis was performed for the variables **assignment handed in a timely fashion** and **average family income**. Kendal 's Tau - C analysis provided the evidence of ***p = 0.401***, which indicates a **non-significant statistical response**. This shows that the factors under study do not correlate with each other, in this case it means that the delivery of tasks in time and form is not correlated with the average family income.

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig
Ordinal by ordinal	Tau-c de Kendall	.105	.125	.841	.401

The contingency analysis was performed for the frequency variables **with how often you use the Internet for independent study** and **average family income**. Kendal 's Tau-C analysis provided the evidence of ***p = 0,312***, which indicates a **non-significant statistical response**. This finding shows that the factors under study do not correlate with each other; in this case it means that the frequency in which students use the Internet for independent study is not correlated with the average family income.

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig
Ordinal by ordinal	Tau-c de Kendall	-.117	.116	-1.010	.312

The contingency analysis was carried out for the variables a **factor that demotivates a student in the major (teacher´s methodology and pedagogy)** and **the type of material that the teacher uses in the development of the subject´s content (handouts)**. The Phi analysis carried out provided the evidence of ***p = 0,632***, which indicates a **non-significant statistical response**. This result shows that the factors under study do not have an association with each other, in this case, it means that the factor that discourages the student in the major is not associated with the type of material used by the teacher in the development of the contents of their subject.

		Value	Approx. Sig
Nominal by nominal	Phi	.077	.632

The contingency analysis was carried out for the variables a **factor that demotivates a student in the major (teacher´s methodology and pedagogy)** and **the type of material that the teacher uses in the development of the subject´s content (textbooks)**. The analysis of Phi carried out provided the evidence of ***p = 0,330***, which indicates a **non-significant statistical response**. This finding shows that the factors under study do not have an association with each other, in this case, it means that the factor that discourages the student in the major is not associated with the type of material used by the teacher in the development of the contents of their subject.

		Value	Approx. Sig
Nominal by nominal	Phi	.156	.330

The contingency analysis was carried out for the variables **personal aspect that motivated you to study your major** and **do you know the curricula of your major**. The analysis of Phi carried out provided the evidence of ***p = 0,525***, which indicates a **non-significant statistical response**. This shows that the factors under study do not have an association with each other, in this case, it means that the personal aspect that motivated him to study the major is not associated with knowing the curricula of the major.

		Value	Approx. Sig
Nominal by nominal	Phi	-.102	.525

The contingency analysis was carried out for the **personal aspect variables that motivated you to study your major** and **do you know the professional profile of your major**. The analysis of Phi carried out provided the evidence of ***p = 0,525***, which indicates a **non-significant statistical response**. This result shows that the factors under study do not have an association with each other, in this case, it means that the personal aspect that motivated him to study the major is not associated with knowing the professional profile of his major.

		Value	Approx. Sig
Nominal by nominal	Phi	-.102	.525

The contingency analysis was carried out for the variable **factor that demotivated the student in the major** and **the way in which the Research Methodology class was developed.** The analysis of Cramer performed, provided the evidence of ***p = 0,504***, which indicates a **non-significant statistical response**. This result shows that the factors under study do not have an association with each other, in this case, it means that the factor that discourages the student in the major is not associated with the way in which the class of Research Methodology was developed.

		Value	Approx. Sig
Nominal by nominal	V de Cramer	.210	.504

The contingency analysis was performed for the variables **factor that demotivated the student in the major** and **the way in which the Applied Research class was developed**. The Cramer´s analysis performed, provided the evidence of ***p = 0.045***, which indicates a **significant statistical response**. This result shows that the factors under study are associated

with each other, in this case, it means that the factor that discourages the student in the major is associated with the way in which the Applied Research class was developed.

		Value	Approx. Sig
Nominal by nominal	V de Cramer	.409	.045

The contingency analysis was carried out for the variables **use of TIC for the development of the contents for the Research Methodology subject** and **the type of material that the teacher uses in the development of the contents**. The Cramer´s analysis performed, provided the evidence of ***p = 0,545***, which indicates a **non-significant statistical response**. This finding shows that the factors under study do not have an association with each other, in this case, it means that the use of TIC for the development of the contents of the Research Methodology subject is not associated with the type of material used by the teacher in the development of the contents.

		Value	Approx. Sig
Nominal by nominal	V de Cramer	.285	.545

The contingency analysis was carried out for the **use of TIC variables for the development of the contents of the Applied Research subject** and **the type of material used by the teacher in the development of the contents**. The Cramer´s analysis performed, provided the evidence of ***p = 0.190***, which indicates a **non-significant statistical response.** This result shows that the factors under study do not show an association with each other, in this case, it means that the use of TIC for the development of the content for the Applied Research subject is not associated with the type of material used by the teacher in the development of the contents.

		Value	Approx. Sig
Nominal by nominal	V de Cramer	.407	.190

The contingency analysis was performed for the variables **do you now the professional profile of your major** and **a factor that determined you to choose your major**. The Cramer´s analysis carried out, provided the evidence of ***p = 0.000***, which indicates a **highly significant statistical response**. This shows that the factors under study are associated with each other, in this case, it means that knowing the professional profile of their major is associated with the factor, determined to choose their major.

		Value	Approx. Sig
Nominal by nominal	V de Cramer	1.000	.000

4. DISCUSSION OF RESULTS

In his book "System of Statistical Analysis with SPSS," Pedroza et al. (2006), provides an indicator for determining if there is an association, relationship or correlation between the analyzed factors. Pedroza states that by comparing the results of the statistical tests with the level of significance established (for the study $\alpha = 0.05$), the hypothesis raised by the researcher will be answered. The statistical results section shows the data obtained from the application of the statistical tests in which it is verified that the study does not give rise to association, relationship or correlation of some analyzed factors.

The hypotheses about the association, relationship or correlation of the factors are presented:

Ho: *The factor that discourages the student in the major (the methodology and pedagogy of the teachers) is not associated with the type of material that the teacher uses during the development of the contents (brochures).*

Ho: *The factor that discourages the student in the major (the methodology and pedagogy of the teachers) is not associated with the type of material that the teacher uses during the development of the contents (textbooks).*

The literature emphasizes that the methodology and pedagogy, used by teachers in class meetings, is an element that directly influences the motivation that students will have towards that subject that is being taught. The study compared the existence of an association between the methodology and pedagogy that teachers have when making use of the type of didactic material to grant their academic disciplines and the motivation of students in learning that subject. The statistical data of the tests reveal that in the study this association is not fulfilled (***p=0.632*** and ***p=0.330*** respectively greater than $\alpha = 0.05$. That is, for the students, the material used by the teacher is not the factor that is causing demotivation in them when studying the major.

Ho: *The way in which the class of the Subject Research Methodology was developed will not be the factor that discourages the student in the major (the methodology and pedagogy of the teachers).*

Ho: *The way in which the Applied Research class of the Course was developed will not be the factor that discourages the student in the major (the methodology and pedagogy of the teachers).*

Another element that is presented in the motivation of the student in the teaching-learning process is the environment that the teacher creates in the development of the face - to - face class; it is believed that this element has a direct influence. In the study, we proceeded to analyze the degree of association between these factors. Using as a parameter, the Methodology, and Applied Research subjects. The results of the statistical tests show that: in

Research Methodology, the result ***p = 0.504*** (greater than α = 0.05) determines that there is no association, which indicates the presence of other factors that cause demotivation, such as those mentioned in the theoretical section on pedagogy and teaching methodology.

In Applied Research, the scenario has another meaning. The data obtained by the test ***p=0.045*** (lower than α = 0.05) indicates that the way in which the face-to-face class was developed did influence the demotivation of the student body. It should be noted that the student taking this course has experience on how to evaluate the methodological and pedagogical performance of the teacher since he has completed eight semesters.

Ho: *The use of ICT for the development of the contents of the Subject Research Methodology will not influence the type of material used by the teacher in the development of the contents (brochure).*

Ho: *The use of ICT for the development of the contents of the Applied Research Subject will not influence the type of material used by the teacher in the development of the contents (textbooks).*

Regarding the technological tools used by the teacher in his academic management, both in the subject Research Methodology and Applied Research, it is shown that there is no association with the type of material he uses (***p = 0.545*** and ***p = 0.190***, respectively greater than α = 0.05). This result is because the teachers of these subjects use traditionalist approaches in their teaching, indicating that the methods and strategies are traditional "booklets or textbooks". One of the manifestations of the use of technological tools in teachers is simply to obtain information and make a replica of the digital material, even knowing the great knowledge coverage that can be exploited and then shared with their students.

Ho: *The personal aspect factor that motivated a student to study a major (I liked it) is not associated with knowing the major of his major.*

Ho: *The personal aspect factor that motivated a student to study a major (I liked it) is not associated with knowing the professional profile of his major.*

When you want to study a major in professionalization, a diversity of opinions converge on the fact that you should have a vocation for such a decision and many familiarize you with the tastes and preferences of the individual, a situation that motivates you to take action. When performing the statistical tests to verify the existence of an association between the factors expressed in the hypothesis, it revealed that the factors such as knowing the major profile and professional profile are not a cause to determine if students were motivated to study the Banking and Finance major. (Both with ***p = 0.525*** greater than α = 0.05) But, they chose this major considering other parameters.

Ho: *Knowing the professional profile of the major will not influence in determining the major choice.*

When the statistical test was performed to know the association between the factors mentioned in the hypothesis, the existence of such an association was obtained, demonstrating that the student knew what he was going to face in the labor field once he graduated.

Ho: *The origin of the students does not intervene in the selection of the independent study method (I visit the library).*

Ho: *The origin of the students does not intervene in the selection of the method of independent study (Internet use).*

Ho: *The frequency of study in a group manner is not associated with the origin of the student.*

In the empirical area, it is believed that the academic performance is influenced to a high degree over the geographical origin of the students. Emphasizing that those who come from the rural sector show challenges in the development of their student life since they do not have the necessary tools to face the academic demands; distance and economic resources prevent them from having constant encounters in study groups, among other hypotheses. The data obtained in the survey show that approximately 23% of the student population in the cohort of the Banca y Finanzas race comes from the rural area.

When applying the statistical tests to determine the degree of association and correlation between the factors cited in the hypotheses; as a result, we obtained that there is no association between the provenance with the independent study method. Internet use or visiting the library, situation that depended on the characteristics found in the study group, since there is an excellent influence in having more than half of the population coming from the urban area, when compared with the frequency of group study, in the same way, it is not evident the correlation.

This finding is complemented with other results of tests carried out in which it is evident that they have access to using the technological means and the sociability of sharing knowledge among peers for their independent study without many obstacles.

Ho: *The average family income in the homes of the students does not intervene in the selection of the independent study method (Internet use).*

Ho: *The average family income in the homes of the students will not be a factor that intervenes with the place where they access the Internet for their independent study (in a cyber).*

The various researchers have established in their articles, that academic performance is linked to the factor "economic income available to the individual," considered as one of the leading elements that favor or disadvantage the student. The study proceeded to perform the correlation to verify the degree of association between the factors described in the hypotheses.

The empirical data show a ***p = 0.744*** and ***p = 0.843*** respectively (greater than $\alpha = 0.05$) indicating that: the average income they have The students in the study cohort were not an obstacle for them to select the study method that will adjust to the satisfaction of their needs. In today's modern world, technology facilitates obtaining scientific knowledge of any area of science in an accessible manner and with a greater variety of sources.

Even when the student does not have enough economic resources to face the costs of studying under the technological path (the use of the Internet requires having a computer and the service contract) it does not prevent a student from accessing it. Since he makes use of the existing cybercafe services in the area where he lives or studies, but what impact does his average family income have on accessing it? The result of the statistical test affirms that it is not a factor that restricts the student because the access cost is favorable.

Ho: *The frequency of attendance at classes is not associated with the average income received by the students' homes.*

Ho: *The delivery of tasks promptly is not associated with the average income received by the students' homes.*

Ho: *The frequency that you use the Internet for independent study is not associated with the average income earned by the students' homes.*

In the same way, correlation tests were carried out for the factors described in the hypotheses to determine if the average income of the families influences them. In all three hypotheses, the result is that there is no correlation since their ***p-values*** were more significant than $\alpha = 0.05$, which continues to affirm that in the students of the 2011-2015 cohort it has not been an obstacle to have limited economic resources for getting an excellent academic preparation.

5. CONCLUSION

Through the application of the non-parametric statistical tests of Cramer, Tau - C of Kendall and Phi it was determined that 88% of the correlations do not present an association between the subjective and objective factors that affect the academic performance of the students of the Banking and Finance major. The FAREM-Carazo, UNAN-Managua, 2011-2015 cohort; verifying that the hypotheses posed by the authorities, the university community and society concerning such factors are not met in a generalized manner, but depend on the particular characteristics of the population to be studied.

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