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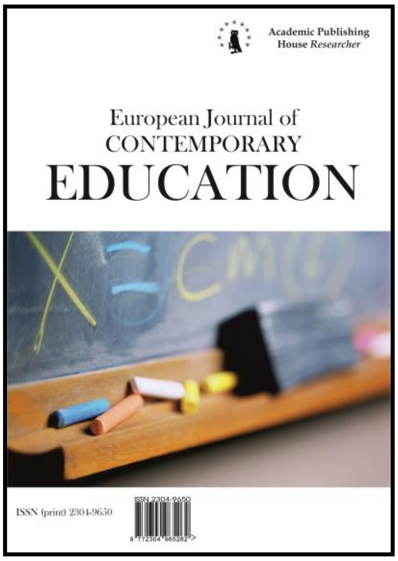

Financial Literacy Level on College Students: A Comparative Descriptive Analysis between Mexico and Colombia

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Abstract

This main objective of this study is the measurement of financial literacy in college students from Mexico and Colombia, using an instrument that was designed based on the available literature review and which was applied to a sample of 224 students. It was possible to find slight differences between the two countries, but the results as a whole were concerning as they showed a low level of financial literacy in the analyzed population, specifically in the topics of retirement planning, inflation, credit (credit card usage), savings and investment and risk diversification. This paper also proposes a questionnaire considering seven financial topics which measures the level of financial literacy and can be replicated in other study populations.

It is important to point out that college students are an important opportunity to focus the efforts on financial literacy, since they are in a crucial stage of their lives when they are beginning to get into the work force or will do so soon, which is why this information can be used in a near future and by having it they can use financial instruments in a proper manner and for their benefit, helping them to achieve their financial goals and avoid financial problems during their life, contributing to their future wellbeing and society in general.

Keywords: financial literacy, college students, retirement planning, numeracy, saving and investment.

1. Introduction

Currently, financial literacy has gained more relevance than before due to the accelerated growth of capitalist financial markets and an increase of the number and complexity of financial products and services. Because of the former, people require the knowledge that allows them to

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have an adequate level of financial literacy, which can in turn help them to better use financial products and services, as well as made good financial choices.

Financial literacy can be taught and promoted in college institutions, since students are at an age when they are already in the work force or will soon be getting a job and besides, they are old enough to purchase different financial products and services in the market, such as bank accounts, credit cards or insurance, among others.

Worldwide, it is possible to find economic recessions, inflation, unemployment and decrease of purchasing power (Taft et al., 2013), which is why people need a knowledge and a set of skills that allows them to manage their finances properly. Furthermore, they need to take a larger responsibility regarding their financial wellbeing, specially because of the increase of financial products that are increasingly more complex, such as credit card conditions, mortgages, loans and credit lines (Lusardi, Mitchell, 2014), since even though they provide better opportunities for consumers, they present bigger risks for those people lacking the necessary financial knowledge too (Mandell, Schmid-Klein, 2009).

The work by Chen & Volpe (Chen, Volpe, 1998), explains that the ability to manage personal finances is becoming more important in today's context. Moreover, they state that people must plan their investments in a long-term for retirement and the education costs of their children. Another issue they must make decisions about is their short-term savings and loans, a house credit, a car loan and other costly expenses, besides handling their own medical needs and life insurance.

For the reasons stated above, the subject of financial literacy emerges with the aim of measuring the level of understanding about the information required by a person to make responsible financial decisions, although it must be taken into account that people introduce values, wrong perceptions, fears and shared goals to the decision making of financial matters (Holden, 2010).

College students have been a common population of study because of the importance of financial literacy in young people (Danes, Hira, 1987; Armstrong, Craven, 1993; Chen, Volpe, 1998, 2002; Hayhoe et al., 2000; Staten, Barron, 2002; Lawrence et al., 2003; Lyons, Hunt, 2003; Johnson, 2005; Murphy, 2005; Cude et al., 2007; Borden et al., 2008; Sabri, MacDonald, 2010; Robb, 2011; Lusardi, Wallace 2013; Moreno-García et al., 2013), since higher education is a moment in people's lives when they must or at least, begin to enter the financial system as citizens with enough age to access financial products and services available in the market and so, the decisions they make will cause repercussions in their economical wellbeing.

Lusardi & Wallace (Lusardi, Wallace, 2013) state that young people usually have a low level of financial literacy and are commonly the group with the lowest level of financial literacy in the United States and in other countries, as well as having poor financial behavior. As such, young people are one of the most vulnerable populations and thus, financial literacy most emphasize a quantitative practical component.

College students have been the subjects of study in financial literacy research, being one of the first studies on the matter the one by Danes & Hira (Danes, Hira, 1987), who analyzed the college students' knowledge about credit cards, insurance, personal loans, record keeping and financial management in general, finding that men know more than women in several topics, married students know more than those who are single and students of senior years know more than those in junior years, but their most important finding was that college students have a low level of financial knowledge.

The seminal study by El Chen & Volpe (El Chen, Volpe, 1998) analyzed financial literacy of college students and found that the level of financial literacy of young people is very low, limiting their ability to make informed financial decisions. Additionally, it was found that college students enrolled in management related careers have a higher financial literacy level than the ones in other programs.

Avard, Manton, English & Walker (Avard et al., 2005) applied a multiple-choice test to determine the financial literacy level of junior college students, proving that this population has no knowledge about financial topics of daily life and so, they propose the possibility of including the subject of financial literacy in the general curriculum due to its high importance

Another example of financial literacy research in college students is the study by Cude et al. (Cude et al., 2006), where the aim is to investigate how college students acquire their financial literacy and the behaviors and factors related to higher risk for students. Furhtermore, the studies by Sabri in Malaysia have been analyzing other elements relation to the financial literacy of this population, such as the variables related to the financial wellbeing of college students, including their childhood experiences, financial socialization and financial literacy (Sabri et al., 2012), as well as the relation between saving behavior, financial problems and financial literacy of college students (Sabri, McDonald, 2010).

Again in Malaysia, Ibrahim, Harun & Isa (Ibrahim et al., 2010) emphasize the importance of financial literacy for college students, focusing on the context, financial attitude, financial knowledge and family. By analyzing the obtained data using the software SPSS 12, they found that most students do not put into practice the necessary skills for financial management, which is why the authors expect measures will be taken to solve this issue.

De Bassa Scheresberg (De Bassa Scheresberg, 2013) examined financial literacy and behavior of young adults, finding that most of them lack basic financial knowledge and even though some demographic groups like women, minorities and people with low income and low schooling level have a particularly low financial literacy level, a high schooling level is not a guarantee of having good financial literacy. The surveyed population with higher financial literacy or higher confidence in their mathematics and personal finance knowledge obtained better financial results: they have a lesser probability of using high-cost loans and are more likely to save for retirement and save money for emergencies.

Specifically in the Latin American context, the work by García, Grifoni, López & Mejía (García et al., 2013) is a relevant effort to analyze the current situation and perspectives of financial literacy in Latin America and the Caribbean, using data gathered by evaluation exercises worldwide and surveys applied by the INFE (Intenational Network of Financial Education)/OECD, Bank of the republic, Fogafin (Financial Institutions Guarantees Fund) and CAF (Andine Cooperation of Promotion), the latter one carried out in 16 countries of Latin America, including Mexico.

The results of the former study are concerning, since they show a "generalized ignorance among the population" regarding basic financial concepts, such as inflation, interest rates, relation between risk and profitability or the operation of the capital market; also, women have, in average, a lower level of financial knowledge than men and in Colombia and Peru, those with higher income have more knowledge on financial matters (García et al., 2013).

Likewise, Raccanello & Herrera (Raccanello, Herrera, 2014) discuss the particular case of Mexico, highlighting that in said country, the process of financial inclusion is ongoing and mention that despite the initiatives regarding financial literacy, the financial knowledge of the population is insufficient, which can harm the wellbeing of Mexican people and their families.

Also in Mexico, Arceo-Gómez & Villagómez (Arceo-Gómez, Villagómez, 2016) made a research about the financial literacy level of high-school students aged 15 to 18 years old, using for this purpose an instrument designed by themselves, based in the methodology by the OECD and Lusardi & Mitchell. The results of this study showed low levels of financial literacy in the country; however, 57 % of the surveyed population got a high score in financial behavior, while 70 % showed positive financial attitudes. Other relevant findings include the fact that gender differences were not found and it was the same case for public and private schools or by household income.

Considering high-school students as the population too, Zamora-Lobato, García-Santillán, Moreno-García, López-Morales & Ramos-Hernández (Zamora-Lobato et al., 2017) analyzed the perception of 401 Mexican students on variables related to financial literacy: saving, investment, pensions, credits, debts and expenses and budgets, finding that mostly, the students have a positive perception of financial institutions and the products they offer.

In the Mexican context it is possible to find studies about the financial literacy level of college students, such as the research by Moreno-García, García-Santillán & Gutiérrez-Delgado (Moreno-García et al., 2017), which targeted a population of college students enrolled in economic-management careers, assessing their knowledge on topics like interest rate, inflation, savings, credit card use and budgeting; the results showed that this young people have the knowledge and habit of making a budget about their expenses, although their financial literacy level is very low with regard to the other variables.

Another example is the work by Moreno-García, García-Santillán & Munguía Tiburcio (Moreno-García et al., 2013), who measured the financial literacy level of college students enrolled in the Accounting program of a public institution, also taking into account the variables of age, gender, socio-economic status, personal preferences and learning styles.

Using factorial analysis methods with component extraction, Pearson lineal correlation, T test and Z test, these authors found that there was a poor financial literacy level among the studied population, which was contrary to expectations taking into consideration the career they were studying and so, the authors consider that this is due to a lack of proximity to the formal financial system since an early age or the lack of information received by the people around them, which is caused by a general ignorance of the population regarding financial instruments.

On the other side, there are few empirical studies in Colombia about financial literacy, although there is information from international surveys, such as the PISA tests of 2012, where the country obtained the last place of financial literacy among the selected countries.

Recently, the Center of Research for Development (Centro de Investigaciones para el Desarrollo, 2016) researched the students of the Economy Faculty of the National University in Colombia, as well as the Faculty of Finances, Government and International Relations of the Externado University in Colombia, considering three elements: financial knowledge, attitudes and behavior, finding that college students have average level of financial capability.

Among the most important findings of this study, it is possible to find the fact that young people have serious deficiencies in the knowledge of basic saving and credit products, interest rates and value of money over time; regarding attitudes, they are interest in saving but in the short-term to buy recreation products, clothes or home appliances even though they need better skills for future planning, have more proximity to the financial system and be more informed about the economic conditions of their environment.

The research of Carvajal, Arrubla & Caicedo (Carvajal et al., 2016) is another of the few examples in Colombia about financial literacy level in college students and their results show that most students are not making a financial planning due to the lack of knowledge they have about finances and the lack of information on the subject, which lead them to excessive indebtedness and no retirement planning or savings for the future.

In this study, the aim is to determine the level of financial literacy of college students and thus, the research question is: what is the financial literacy level of college students?

According to the former, the work hypotheses are the following:

H_{01}: The financial literacy level of college students is not low.

H_{i1}: The financial literacy level of college students is low.

2. Design and method

The present study is non-experimental because it was carried out without manipulating or modifying in any way the independent variables (X) in the attempt to alter the effects (variables Y). Furthermore, it is a transversal study since the instrument was applied in a determined period (during the months of September to November 2017).

The subjects of this study are college students, who have been the population used by a number of financial literacy studies, due to the fact that this young people have already reached adulthood legally and are therefore capable of buying financial products and services, starting to insert themselves in the economical market. The sample was made up by 224 college students from Mexico and Colombia, enrolled in higher education institutions, both public and private.

It is important to mention that financial literacy studies have used different variables for measure, usually basic financial topics like cash-flow management, savings, credit, investment, insurance, interest rates, inflation or numeracy, to mention the ones that are more common (Chen, Volpe, 1998; Hilgert, Hogarth, 2003, Lusardi, Mitchell, 2008, 2011; Huston, 2010; Lusardi, 2013).

In the particular case of this research and considering the empiric information on the subject, the following financial topics were chosen to determine the financial literacy level of college students:

- **Retirement planning** (Lusardi, Mitchell, 2011)
- **Inflation** (Lusardi, 2013)
- **Numeracy** (Lusardi, Mitchell, 2007; Lusardi, 2012)
- **Insurance** (Huston, 2010)
- **Credit** (Huston, 2010, 2012)
- **Saving and investment** (Volpe et al., 1996; Chen, Volpe, 1998)
- **Risk diversification** (Lusardi, 2011, 2013)

Taking into account these financial topics, mini-cases were established with four possible answers, one correct and three incorrect, which is measured quantitatively by setting the value 1 for wrong answers and 2 for the right answer. Therefore, the maximum score that can be obtained from the mini-cases about financial literacy is 18 points, while the lowest score is 9 points. The following measurement ranges were set for the financial literacy level of college students:

Excellent: 18 points, Good: 17 points, Average: 16 points, Poor: between 14 and 15 points, Bad: from 10 to 13 points, Zero: 9 points.

Considering all the information stated before, the results obtained in this study are presented below.

3. Results

It was possible to measure the level of financial literacy of college students by considering the results on the mini-cases about financial topics included in the designed instrument and so, it was possible to observe that college students do not have a high level of financial literacy.

Firstly, in the next figure presents the level of financial literacy of the entire population considered in this research, which includes college students from the countries of Mexico and Colombia.

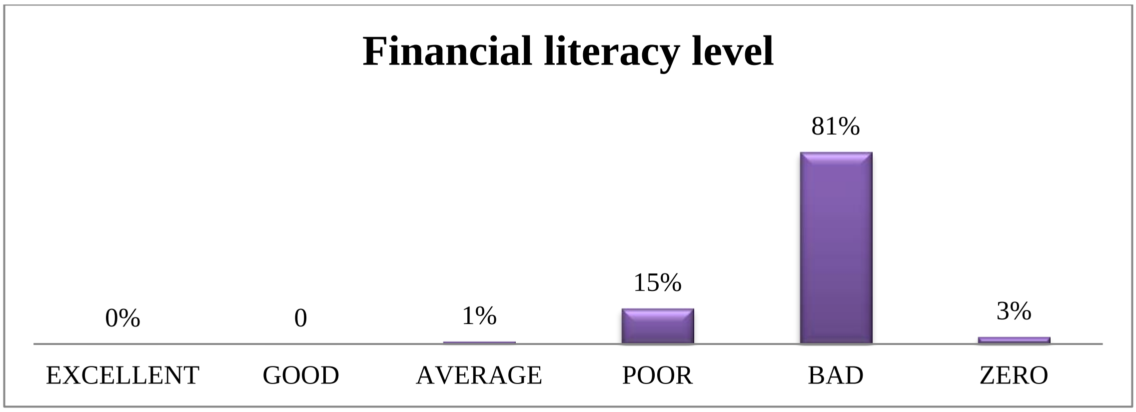

Fig. 1. Financial literacy level

In this first figure it is shown that most of the population (81 %) have little notion about the financial topics considered in the 9 mini-cases presented in the instrument, answering correctly between one and four cases (bad), while 15 % knows something (poor) about these financial topics with 3 or 4 correct answers and 3 % did not manage to provide a single right answer (zero). It is important to point out that none of the surveyed students were able to correctly solve all the mini-cases and only 1 % got an average score (7 right answers) in financial literacy.

Next, there are the figures of the financial literacy level of college students in Mexico and Colombia considering each of the countries separately so it is possible to observe the differences between both countries.

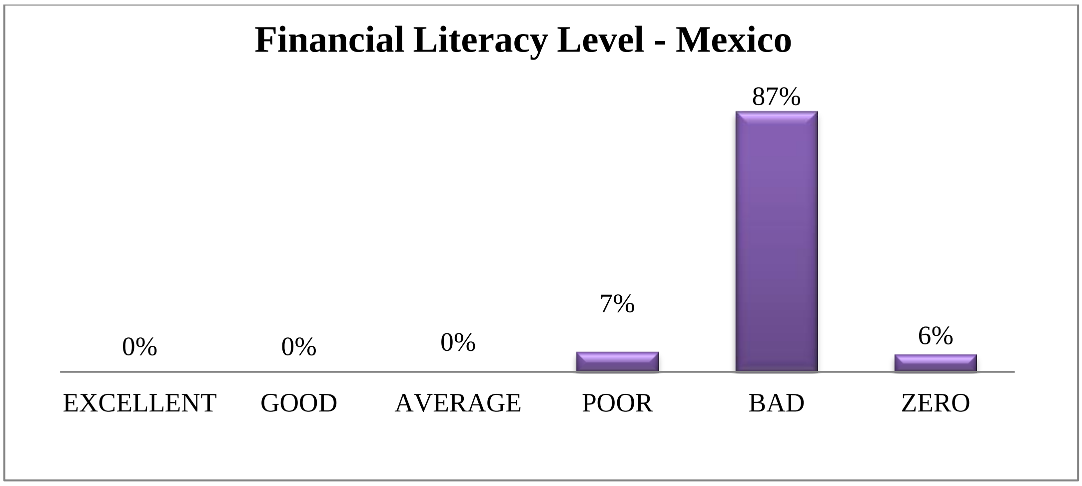

Fig. 1.1. Financial literacy level in Mexico

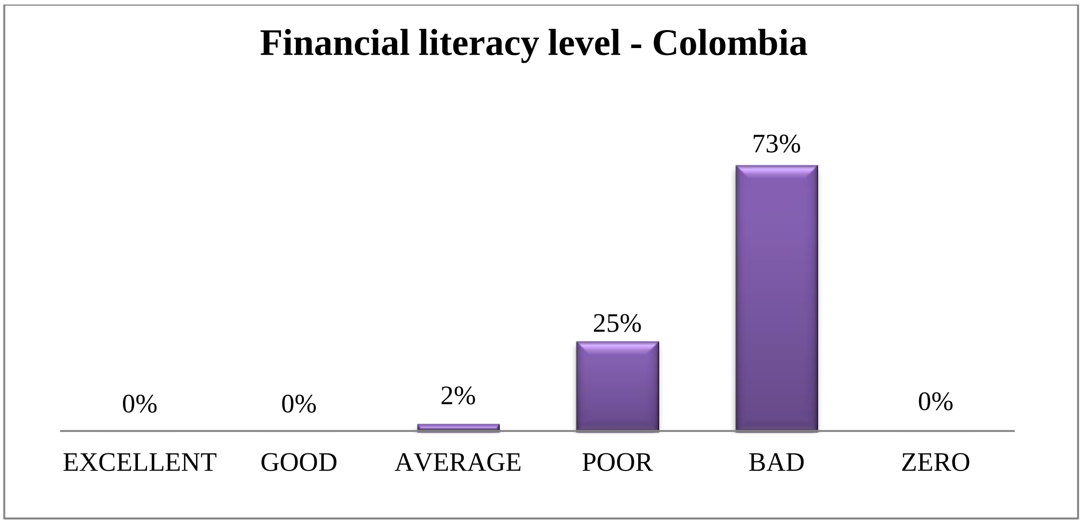

Fig. 1.2. Financial literacy level in Colombia

Generally, it is possible to observe that college students from Colombia obtained better results on their financial literacy level, in comparison with Mexican students, since there is a larger number of Colombian students with average (2 %) and poor (25 %) levels; furthermore, none of them failed all the answers while none of Mexican students attained an average level and on the contrary, a small percentage (6 %) failed all the mini-cases.

The research also allows to know the financial literacy level considering each of the topics in particular, by measuring each of the cases and next the results of each of the financial topics used in the instrument will be discussed.

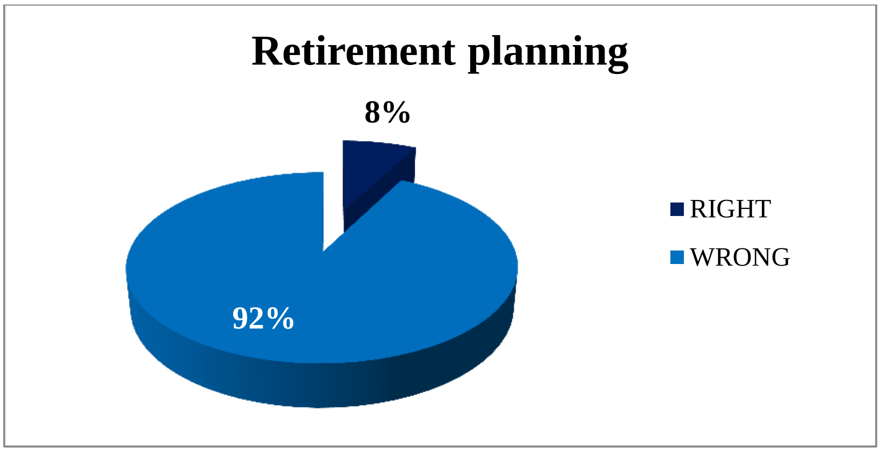

Fig. 2. Retirement planning

In retirement planning, most students provided the wrong answer (92 %), which indicates that they don't know about the actions they need to do to plan for the future, being this cause for concern since they are about to enter the work force and this lack of knowledge can cause economic problems during after retirement.

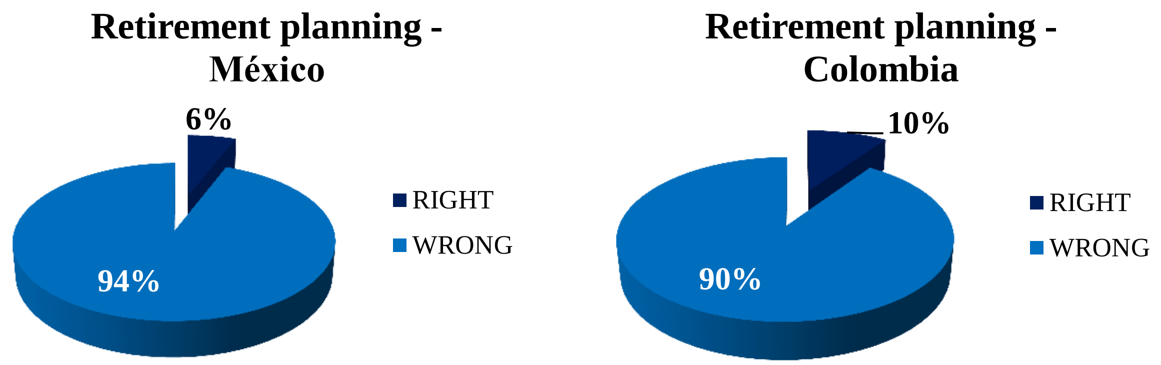

Fig. 2a. Retirement planning – Mexico – Colombia

Almost the entire population of both countries chose the wrong answer in this mini-case but it is important to point out that even if the results were similar, Mexico got lower results (94 % of wrong answers').

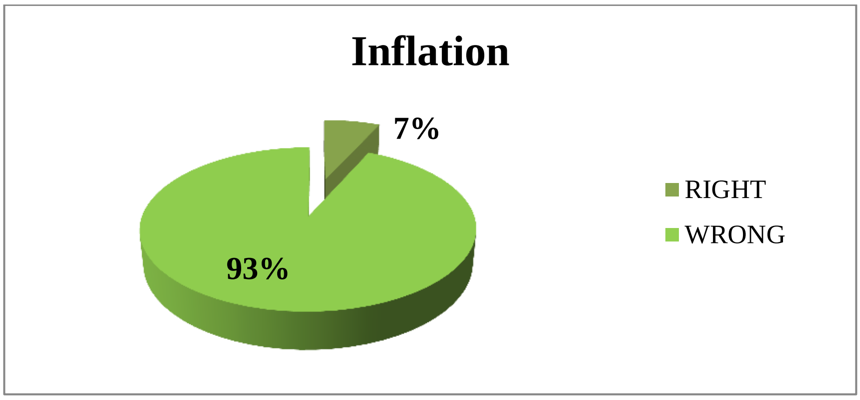

Fig. 3. Inflation

With regard to inflation, results shown in Figure 3 prove that almost all college students (93 %) don't understand the effects of inflation in their purchasing power, being from developing countries where the effects of inflation are visible.

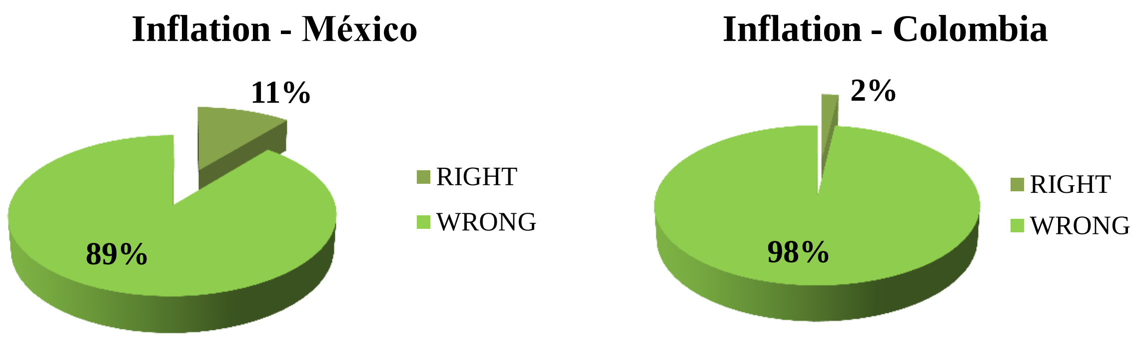

Fig. 3a. Inflation – Mexico – Colombia

A significant part of college students in Mexico (89 %) and almost all of the ones from Colombia (98 %) failed to provide the right answer about inflation, Mexico being the one with better results.

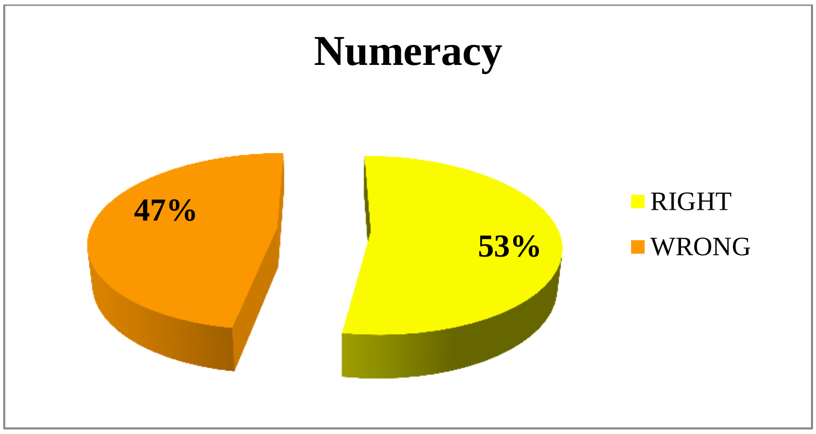

Fig. 4. Numeracy

Regarding this financial topic, more than half of Mexican and Colombian students Colombia (53 %) were unable to do a correct calculation of interest rate, while 47 % lacks the math ability needed to perform a simple calculation for a concept that should be understood in order to adequately use several financial instruments such as credit cards, investments or loans, to mention a few.

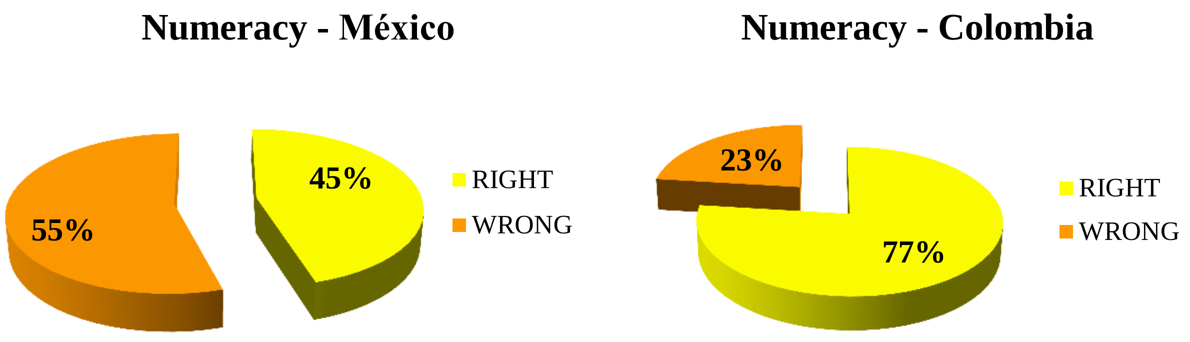

Fig. 4a. Numeracy – Mexico – Colombia

Even though the results are similar in both countries, since Mexico and Colombia got 55 % and 61 % of right answers respectively, there is a larger number of correct answers in Colombia.

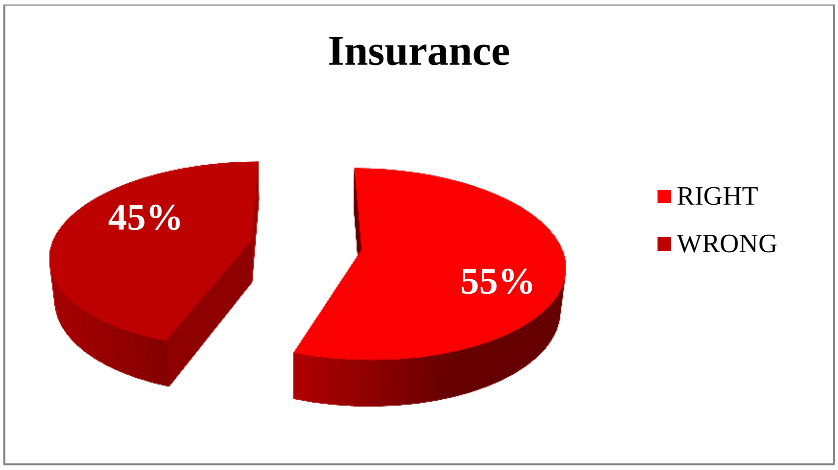

Fig. 5. Insurance

More than half of students (55 %) responded correctly in the mini-case about insurance, meaning that they do know their function, regardless of having hired insurance or not. However, 45 % is a significant percentage of students who don't know what insurance is used for and thus, in case of a loss or a situation that requires an important amount of money to confront, they will not be ready to face it, affecting their financial wellbeing.

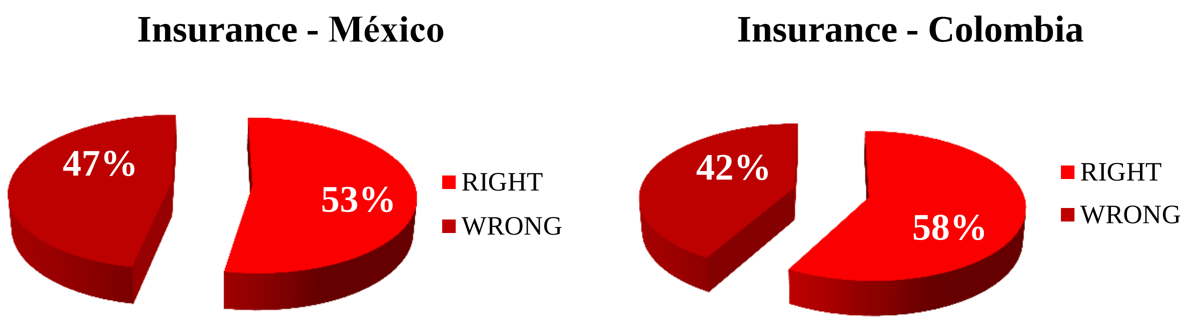

Fig. 5a. Insurance – Mexico – Colombia

There is a slight difference regarding the topic of insurance, being Colombia the one with better results that Mexico with 58 % against 53 % of correct answers.

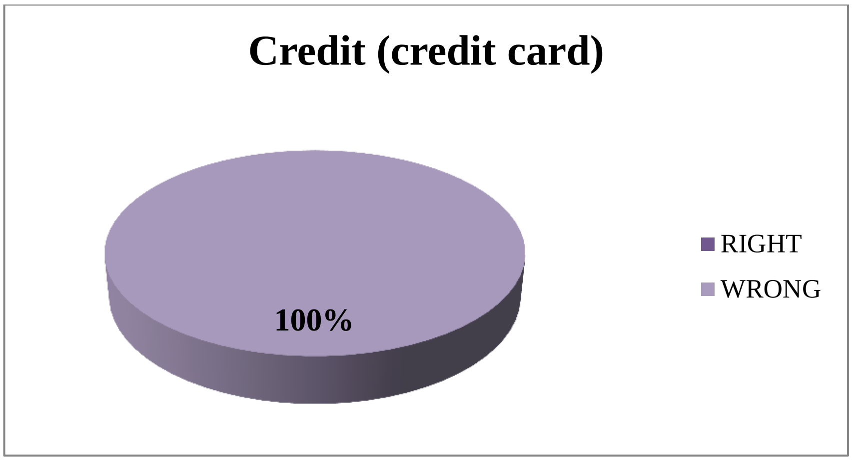

Fig. 6. Credit (case 1)

Regarding the topic of credit, there were mixed results according to the two different kinds of credit instruments considered in this research; in the first case, it can be seen in Figure 6 the case about credit cards and all the college students (100 %) do not know how they work, even when they already have the necessary age to have a credit card, which could cause a poor use of these financial products and cause indebtedness.

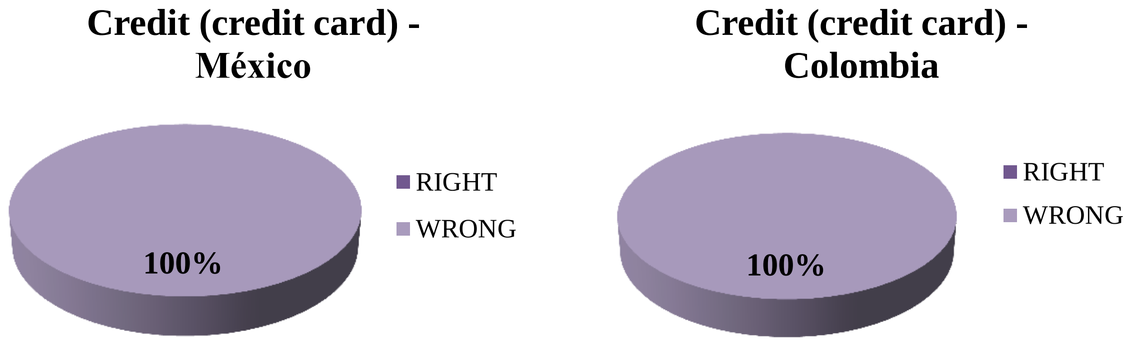

Fig. 6a. Credit – Mexico – Colombia

It is possible to see that the results in both countries were exactly the same because all of the students from Mexico and Colombia were incapable of answered the mini-case on credit cards correctly.

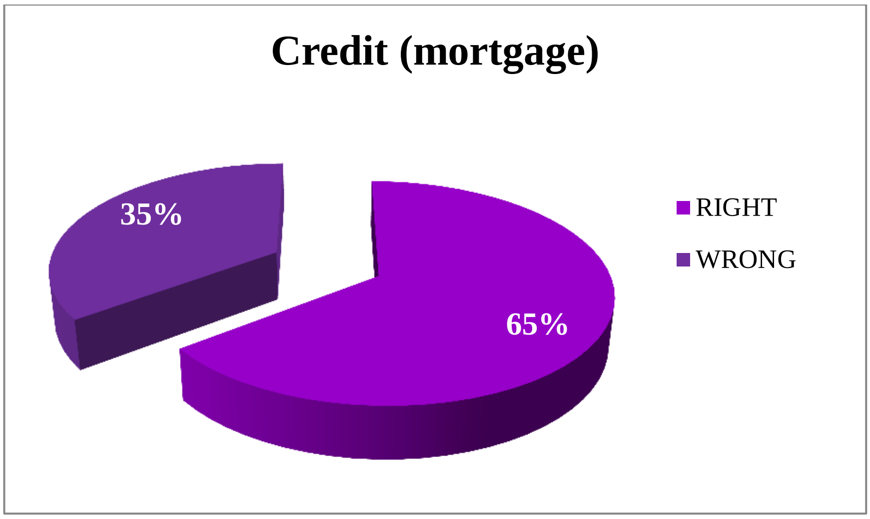

Fig. 7. Credit (case 2)

On the contrary, in the mini-case about a mortgage credit (Figure 7), there was a larger number of correct answers since almost two thirds of the surveyed (65 %) understand what the most convenient option for a mortgage credit, which in a near future will be useful for them when they have to buy a property.

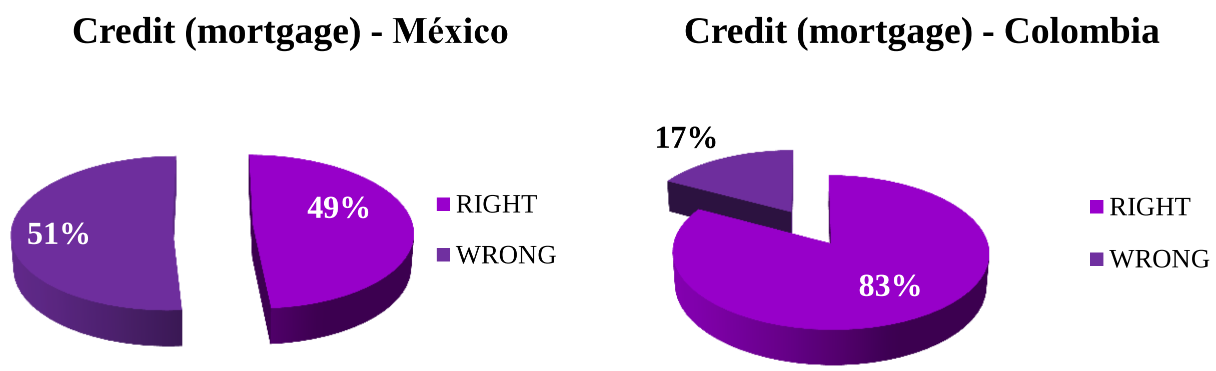

Fig. 7a. Credit – Mexico – Colombia

With regard to mortgage credit, the differences are significant between both countries, as Mexico obtained almost half (49 %) of correct answers while most of Colombian students (83 %), provided the right answer.

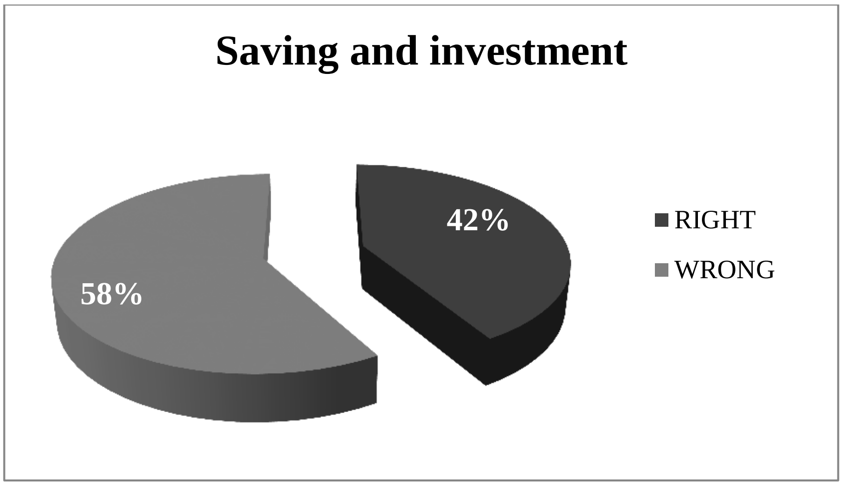

Fig. 8. Saving and investment

Less than half of the surveyed students (46 %) answered correctly the question about saving and investment, even though these are financial products that hold a significant importance for the creation of a patrimony, as well as facing unforeseen circumstances or greater expenses. The resources held in saving and investment can be used to acquire assets, pay bills in case of need, solvent an emergency or set up a business, to mention some relevant examples, and despite this, students lack knowledge about this issue.

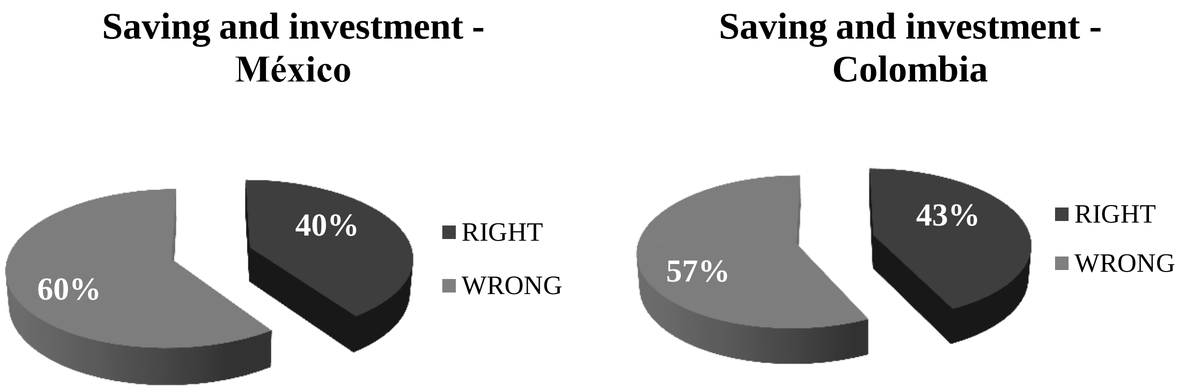

Fig. 8a. Saving and investment – Mexico – Colombia

Regarding the mini-case about saving and investment, results were similar in Mexico and Colombia, although more Colombian students answered correctly (43 %) compared to Mexican students (40 %).

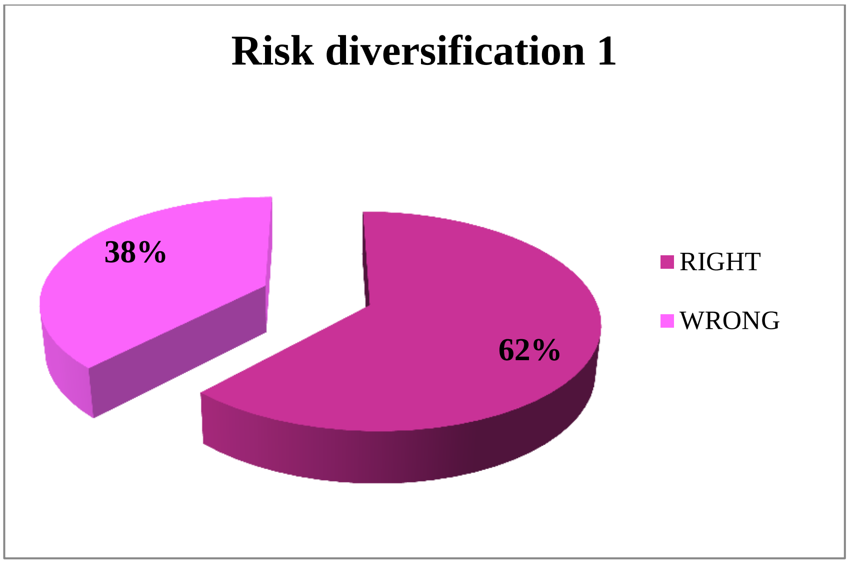

Fig. 9. Risk diversification (case 1)

Again there were differences in the results of the mini-cases about the subject of risk diversification and in the first case, a good portion of the surveyed students (62 %) do recognize the advantages of having a risk diversification strategy in order to reduce the possibility of losing money in the investments, as it is shown in the former Figure 9.

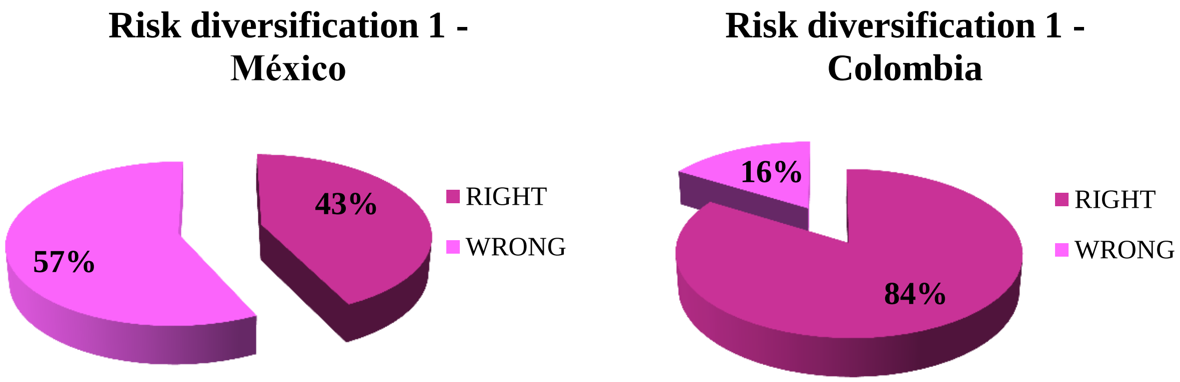

Fig. 9a. Risk diversification (case 1) – Mexico – Colombia

It is possible to see that in the topic of risk diversification, results were profoundly different in both countries; less than half of Mexican college students (43 %) provided correct answers for this mini-case while the majority of students from Colombia (84 %) were able to give the right answer.

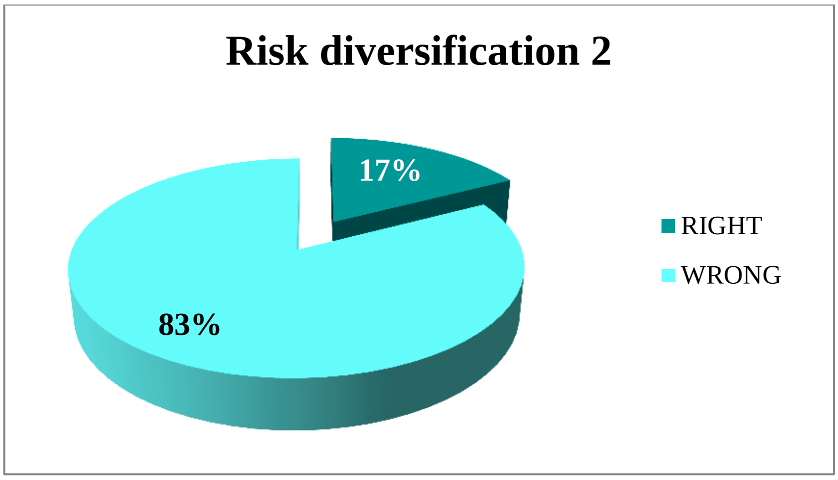

Fig. 10. Risk diversification (case 2)

Despite the previous results, most college students (83 %) do not know what to do in order to carry out a risk diversification strategy and so, in case they decide to make investments in high-risk financial instruments, they are incapable of making the pertinent decisions to reduce the risk.

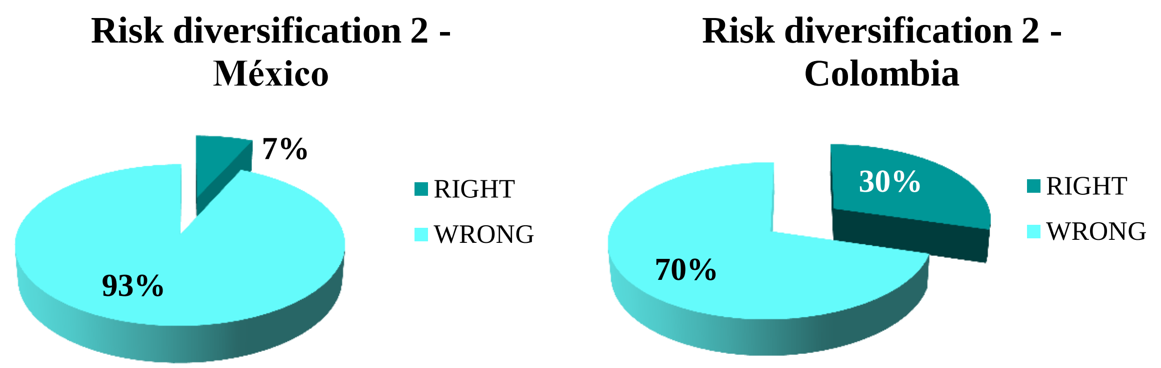

Fig. 10a. Risk diversification – Mexico – Colombia

The differences are evident in the second mini-case on risk diversification, since even though both countries provided the wrong answer, Colombia had a larger percentage of right answers (30 %) than México (7 %).

4. Conclusion

It is important to highlight that this research presented a new instrument to measure financial literacy, considering the following topics: retirement planning (Lusardi, Mitchell, 2011), inflation (Lusardi, 2013), numeracy (Lusardi, Mitchell, 2007a; Lusardi, 2012), insurance (Huston, 2010), credit (Huston, 2010, 2012), savings and investment (Volpe et al., 1996; Chen, Volpe, 1998) and risk diversification (Lusardi, 2011, 2013).

The results obtained from both of the countries considered in this study were similar but some differences were found in general and for each specific topic, being Colombian students the ones who mostly got a larger number of correct answers, proving that this population of college students had a higher financial literacy level than the Mexican students in this research. The financial topics of risk diversification (both mini-cases), credit (mortgage) and numeracy were the ones were the differences between Mexico and Colombia are evident, being the latest the country that got better results.

For both countries, the obtained results were concerning due to the low level of financial literacy shown by students and likewise, it was possible to observe each of the financial topics specifically, finding that the topics most students answered wrongly and therefore, do not know about, are: retirement planning, inflation, credit (credit card), savings and investment and risk diversification (case 2); on the other hand, the topics were they got the right answers were: numeracy, insurance, credit (mortgage) and risk diversification (case 1).

Thus, it was proven that in the seven financial topics considered in the nine mini-cases of the instrument, college students were capable of correctly solving an interest rate calculation, know the usefulness of insurance, know the best option for a mortgage credit and realize that making several investments allows for risk diversification.

These results coincide with a large amount of studies on this subject, where measurements of the financial literacy levels were made and low levels of financial literacy were found in college students (Danes, Hira, 1987; Chen, Volpe, 1998; Avard et al., 2005; Mandell, Schmid Klein, 2007; Lusardi et al., 2010; Lusardi, Wallace, 2013).

Additionally, research made in the countries of this study found a low level of financial literacy among the population too, especially in college students (Moreno-García et al., 2013, Moreno-García et al., 2017 in Mexico and Carvajal et al., 2016 in Colombia).

Considering the low levels of financial literacy shown by the students considered in this study, the findings match the ones by De Bassa Scheresberg, Lusardi, & Yakoboski (De Bassa Scheresberg et al., 2014), who found that even though *millenials* (the same generation of the population considered in this research), believe they have a great ability in the management of financial issues, these is a contrast with the financial literacy levels shown by them by answering a series of questions about financial topics where they showed a low performance.

It is important to point out that college students are an important opportunity to focus the efforts on financial literacy, since they are in a crucial stage of their lives when they are beginning to get into the work force or will do so soon, which is why this information can be used in a near future and by having it they can use financial instruments in a proper manner and for their benefit, helping them to achieve their financial goals and avoid financial problems during their life, contributing to their future wellbeing and society in general.

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Appendix

Financial Literacy Test

Gender: ( ) Male ( ) Female Marital status: ( ) Single ( ) Married ( ) Common law
Currently working: ( ) Yes ( ) No Career or major:
____
Country: __________________________ College:
____

1. Assuming you are already working, what actions would you take to plan for the future?

a) Get a loan to buy a house
b) Get a loan to buy a car
c) Save 10% of my salary for retirement
d) Make additional payments to my 401 (k) plan

2. Imagine that the interest rate on your savings account was 1 % per year and inflation was 2 % per year. After 1 year, how much would you be able to buy with the money in this account?

a) More than today
b) Exactly the same
c) Less than today
d) Do not know

3. Suppose you had $ 100 in a savings account and the interest rate was 2 % per year with monthly capitalization. After 5 years, how much do you think you would have in the account if you left the money to grow?

a) More than $110.00
b) Exactly $110.00
c) Less than $110.00
d) It is impossible to tell from the information given

4. The main reason to buy insurance is:

a) Protect you from a loss recently incurred.
b) Provide you with excellent investment returns.
c) Protecting you from sustaining a catastrophic loss.
d) Protect you from small incidental losses.

5. Suppose you owe $3,000 on your credit card. You pay a minimum payment of $ 30 each month. At an Annual Percentage Rate of 12 % (or 1 % per month), how many years would it take to eliminate your credit card debt if you made no additional new charges?

a) Less than 5 years
b) Between 5 y 10 years
c) Between 10 y 15 years
d) Never

6. Suppose you get a house credit in a financial institution, in which of the following options would you make a higher monthly payment but would pay the least amount of interest?

a) 10 years
b) 15 years
c) 30 years
d) Do not know

7. Considering a long time period (for example 10 or 20 years), which asset described below normally gives the highest return?

a) Savings account
b) Stocks
c) Bonds
d) Do not know

8. When an investor spreads his money among different assets, the risk of losing a lot of money:

a) Increases
b) Stays the same
c) Decreases
d) Do not know

9. What action would you take if you made a high risk investment?

a) Be attentive to the inflation change
b) Hire a medical expenses insurance
c) Exert a coverage or *swaps* coverage option.
d) None of the former and better to be aware to withdraw the investment when necessary.

Thank you.