



FINANCIAL LITERACY OF “TELEBACHILLERATO” STUDENTS: A STUDY OF PERCEPTION, USEFULNESS AND APPLICATION OF FINANCIAL TOOLS

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ABSTRACT

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The aim of this empirical study is to explain how students of a *Telebachillerato* in Veracruz, Mexico perceive financial variables like income, money management, savings, investment, spending and credit. *Telebachilleratos* are high schools for rural communities in Mexico assisted by educational audiovisual support and two or three teachers to explain material to students. Hence, the hypothesis raises the existence of a factorial structure that underlies and that allows to explain the perception and knowledge of students towards these financial topics. For this empirical study, the Financial Education Test by Contreras-Rodríguez *et al.* (2017) was used, which presented an internal consistency of $\alpha = 0.859$, and was applied upon 368 students enrolled in different semesters of a school year. The data were analyzed by exploratory factor analysis with the criterion of extraction of main components. The findings show a favorable perception towards the variables that were analyzed. There is significant evidence in the “income” variable, for instance, about the clear conviction of students that study and training constitute a bridge that will help them earn a good income when they enter into a job. In addition, it was also perceived that extracurricular courses were another potential source to improve their income.

Contribution/Originality: This research is one of the few that have explored the *Telebachillerato* students, who belong to a vulnerable socioeconomic sector of Mexico. This study analyzes the perception of this population segment towards financial tools to ascertain allows to appreciate that educate in financial topics to these young people can not only improve their economic condition but motivate them to keep studying.

1. INTRODUCTION

The issue of education and financial inclusion has currently gained importance in academic debates and in design of public policies of different countries. A need is felt to find alternative solutions to the limitations faced by a significant percentage of the world's population for having not been included in the financial system of a nation. Such a limitation may be due to ignorance or for having not had the opportunity to join the formal economy. Whatever the reason, it has proved a great obstacle in the path of their economic development.

Prasad (2008) commented that financial inclusion is the key to financial and socioeconomic stability in marginalized areas and that it provides greater opportunities for those who are economically less privileged. However, in the current study, it is maintained that the process of financial inclusion is linked to educating people on financial topics. A person having knowledge of financial matters is more likely to be included in the financial

system. Organization for Economic Cooperation and Development (OECD) also suggests that the processes of financial inclusion can be improved through financial education. OECD also indicates that there is a need for permanent improvement in relation to quality and efficiency in learning processes so that learners can absorb more knowledge. It also points out that there is a strong association between lack of income and people's distrust of financial institutions (Garcia *et al.*, 2013).

That people need to have greater knowledge on financial issues has been derived from findings such as the *Global Partnership for Financial Inclusion (2010)* which noted that with greater access to financial tools such as: savings, payment services and insurance, people with less economic resources acquire the ability to stabilize their savings and increase their income capacity, as well as create assets and endure economic crises.

Between these two variables, financial access and income, the *OECD (2017)* presents data that show their strong relationship. The data reveals that 21% people in the lowest income quintile have a formal account in at least one financial institution, while it is 61% in the highest quintile. A gender disparity is identified in Latin America, where 35% of women have a bank account as compared to 44% men. Worldwide, the benchmark is 47% of women compared to 55% of men who have a bank account. Similarly, financial assets are more used by men in the higher income groups and young men with a higher level of education; in contrast, women tend to be better at short-term money management.

In 2014, the World Bank presented a report which shows an evolution of financial service agents to manage personal finances. The data also indicate an increase in the use of technological services for financial management. The increase in financial inclusion in terms of savings and payments having made efficiently is appreciated. It is expected that this trend will contribute to reducing the number of people in extreme poverty and making an impact on the quality of people's life.

The World Bank also argues that the first step for greater financial inclusion is access to a savings account and ability to make other types of transactions, however, it points out that currently approximately 2.5 billion people worldwide still do not have a bank account and the most affected are women, low-income people in rural areas, and micro and small informal enterprises.

Center for Latin American Monetary Studies (CEMLA, 2014), after the financial crisis of 2008, carried out a study and revealed that central banks have incorporated into their main functions the dissemination of data and documents for training purposes. This step would contribute to increase knowledge about financial issues among the population, with the intention of improving their financial decision-making. Simultaneously, other banks also developed educational programs for different financial instruments to be used by general public and especially targeted were primary and secondary students. This initiative of improving financial education was taken by central banks due to the lack of superintendence and with a view to include financial education in the school curriculum.

OECD (2017), on the subject of financial education, has also reiterated to make it a priority in the global policy agenda. It emphasizes that financial education is a central component of financial empowerment of people since it also promotes the stability of the financial system being a pillar of financial inclusion.

In accordance with the need to create a healthy financial environment, therefore, in 2017 the European Banking Authority -based in London- was entrusted the task of analyzing the programs being implemented by each of the national authorities of the European Union. The purpose of the analysis was to verify whether the financial educational programs really favored or provided the necessary conditions to broaden the scope of financial activity reaching a larger audience and expanding the activities of the financial sector.

The result of this analysis showed a gap existing in the implementation of the strategies proposed by the authorities of each participating country. There was also evidence of discrepancy in the distribution and availability of financial services for people in the same territory which was creating a gap between urban and rural areas, with rural areas suffering the most in financial sectors and having the least improvement.

This suggests that knowledge of financial instruments is of great importance in any educational program in order to achieve the impact on the behavior of a specific population. This would also inculcate a greater interest in people and invite greater participation of key actors in the financial development of the region.

The current study has therefore been planned to ascertain the perception and level of knowledge about financial instruments of certain population segments which are otherwise not in the mainstream. The *Telebachillerato* community in the region of Veracruz was chosen for this study which has also been earmarked by the Mexican Government to conduct academic experiments in order to extend educational services to its rural communities. This study aimed at examining how students of this community perceive financial topics like income, money management, savings, investment, spending and credit and what are the latent variables that can verify their financial inclusion.

2. LITERATURE REVIEW

On the subject of financial inclusion and financial education, different studies have been carried out. These studies have focused on the explanation of such issues that are important in the acquisition and development of knowledge of financial topics and the way in which they can be exploited. In this section, therefore, we analyze and discuss those significant findings that will provide a basis for the current investigation.

On financial education, specifically on the issue of money management and people's knowledge and perception about money based on their work and professional profile, [Wernimont and Fitzpatrick \(1972\)](#) carried out a study to determine reasons for possible differences between segments of the population. For this purpose, a scale was created to measure the value that people gave to money.

In this study, the population was segmented into different groups so that they could have access to the survey. The study focused on obtaining the perception of different population sectors about money, and on highlighting the type of economic activity in which they were engaged. The results revealed the existence of two different types of people following distinct opinions: first, one section considered money as a success factor that helped development of any activity; second, there was another section, smaller in comparison, that considered money as a negative factor obtaining for which people may enter into unethical acts.. This suggests that besides its social value, money is also a factor of anxiety and worry when it is scarce.

A study on academic growth of higher level students was carried out by [Danes and Hira \(1987\)](#) The findings of this study reveal the state of financial knowledge of students very low. In spite of having acquired financial education throughout their study period, they are still ignorant about financial topics and concepts. As a result, they fail to weave a broad financial landscape in order to execute the management of their personal finances. This study however observed a positive relationship between knowledge about financial administration and the age of students, but found a difference between the knowledge levels of genders. For instance, men had more knowledge than women about specific issues like insurance and loans, but on the subject of financial management, women knew more than men.

When analyzing the strategies that were taken into account for the improvement of money management, the study found out that the education and financial inclusion program did have some impact on the financial decisions of both men and women. Hence, while these programs were underway, there was some improvement in the management of money by students as well.

Similarly, [Volpe et al. \(1996\)](#) examined the level of knowledge that university students have on financial issues such as personal investments and possible relationships between literacy and gender, their area of expertise and experience. The results suggest that university students have a low level of knowledge regarding personal investments. This fact extends to other disciplines that are not strictly business or finance oriented. In relation to gender, the results have shown that female students have less knowledge about investments than male students.

They also possess less knowledge about the disciplines that do not belong to business or finance areas. The findings also suggest that illiteracy in the subject of personal investment existing in general among students.

Douglas and Garrett (1996) carried out a study in which they sought to determine whether the financial behavior and financial decisions of workers could be influenced by the education they had been given about financial programs. In particular, they sought to know if the workers knew about savings for retirement or what they should do when their retirement process would start.

The results showed that the financial education earned by workers does have a positive influence on their knowledge about financial matters and instruments. In this way, they have a greater probability of success when structuring the plans for their retirement. Therefore, it was concluded that financial knowledge made a positive impact on inclusion and financial literacy, enabling them to effectively plan money management for a dignified retirement. Some of the programs that were analyzed were found influencing their financial decision-making and increasing their family savings. However, such knowledge about financial matters was obtained only when a plan was offered to workers prior to their retirement and not in a regular, continuous manner.

Some organizations in the international context have also articulated their voices about the issue of financial inclusion. Rajan and Zingales (1998) report that organizations such as the OECD, G20, the World Bank, IMF and ECLAC have expressed worldwide concern about financial inclusion forcing most governments to develop such mechanisms that could help the inclusion of all people in financial management. In addition, it was also recognized that access to financial services is important for the population as it increases opportunities for improvement and investment; it also promotes democracy and improves technological progress in a market economy.

In another study Sinclair (2001) pronounces financial inclusion as a method to access financial services and products of a formal financial system in each nation. Along the same lines, Claessens (2006) too explains his idea by pointing out that financial tools are important for economic development since there is a relationship between financial development and the growth of a country. A country with a developed financial system greatly reduces poverty and inequality.

Hogarth and Hilgert (2002) carried out an investigation to identify the level of basic financial knowledge of consumers in the United States. They borrowed a Federal Reserve survey called Monthly Consumer Surveys developed by the Survey Research Center of the University of Michigan. This survey was applied to people from 18 to 97 years of age. The results of the study showed that Americans were more familiar with mortgages, followed by savings, credit cards and general financial management instruments and services. Another important finding of the research was that people with less financial knowledge were more likely to be single, relatively uneducated, with a relatively low income, very young or very old.

Similarly Lusardi and Mitchell (2006) carried out a study whose purpose was focused on finding the possible relationship between adequate planning for retirement and the financial knowledge of people. The results of this study showed that there were differences between the generational groups.

In particular, they found significant differences due to sociodemographic factors, both ethnic and racial. They made a comparison between the Baby Boom generation and subsequent generations and observed that sociodemographic differences do not change with time, despite that, the Baby Boom generation showed a greater interest in the accumulation of heritage but their level of knowledge for an assertive financial planning was much smaller than that of their previous generation.

Concerning the issue of financial inclusion and knowledge about financial topics, it was also important that formal financial systems provide a suitable environment to access these products. In this regard, some theoretical positions have not been concordant in terms of access of their use and application. For example Claessens (2006) points out that the access and use of financial services cannot be the same, since access ensures the availability of a supply of financial services of reasonable quality at reasonable costs, and the use refers to the actual consumption of financial services.

In contrast, Wydick *et al.* (2011) report that in developing countries only a few households have access to formal sources of credit, while most of them acquire loans through informal sources such as lenders, friends and family. The reason is that people consider the formal financial system as a financing alternative with high costs, unlike the informal sources that they perceive as having a lower cost. Robinson (2001) also expressed this phenomenon pointing out that people are forced to use informal mechanisms to cope with their needs.

From the above, the following question arises: how does a *Telebachillerato* student perceive financial topics such as income, money management, savings, investment, spending and credit, in terms of knowledge, use and application? In addition to identifying the student's perception, this study aims to identify the latent variables that can explain the level of knowledge in relation to financial education of the *Telebachillerato* students. Hence, the main objective of the study is to explain the perception and level of knowledge that a *Telebachillerato* student possesses about the financial education.

A priori a directional hypothesis for this research is established: H_1 : there is a latent structure of variables that measure the perception and knowledge of the student in financial topics. On the contrary, H_0 : there is no latent structure of variables that measure the perception and knowledge of the student in financial topics. The decision criterion reject H_0 if $\chi^2_c > \chi^2_i$ if not, it does not reject.

There are also studies which, according to existing theories, highlight the need of inclusion and financial education from the dimensions of income, money management, savings, investment, spending and credit. For instance, in the subject of financial inclusion is a seminal study by Leyshon and Thrift (1995) who defines financial inclusion and introduced those processes that facilitated the entry of people into a formal financial system. In fact, financial education has been rightly accepted essential having access to financial services, in the same manner as having access to basic services such as water, education and health (Peachey and Roe, 2004).

A study carried out by Cude *et al.* (2006) exposed the lack of adequate financial management decisions and demonstrated that nurturing students in a family nucleus brought them closer to an effective management of money. The study stated that students who had a credit card often had problems with its use which made a negative effect on their financial stability. In order to improve financial management of students it was necessary to make a list of responsibilities that could be adapted to their financing needs in a fundamental way. This would also help to implement such programs of basic education that would develop the aptitude and financial behavior of the young people.

Along the same lines, Lusardi (2008) pointed out that economists are currently investigating the causes and consequences of financial illiteracy in order to solve the lack of planning that people have with retirement. The results of their study provided evidence that most households were not familiar with the most basic and necessary concepts to make savings and investment decisions. In the same investigation, the Jump Start Coalition for Personal Financial Literacy was cited, which focused on high schools in the United States and found that students had bad results in terms of credit management and personal finance.

On similar lines, Hanning and Jansen (2010) pointed out that financial inclusion contributed to economic development and reduced poverty. Their study reflected the evolution of policies in the financial sector and the creation of institutions that aimed to balance market and government failures. They also pointed out that this was reflected on people's lives that to a greater extent had scarce resources.

In this regard, Bucher-Koenen and Ziegelmeyer (2011) report that a period of financial crises is used as a natural experiment to study the extent to which households are affected and react to crises.

The results of these studies indicate that people with low levels of financial knowledge are less likely to invest in the stock market and therefore are less likely to report losses. Likewise, people with lower levels of financial experience are likely to sell assets that have lost value, which means that not only do they lose the asset, but also accept the implicit loss in the sale, so that the reaction has potential consequences in the distribution of wealth. This is a further impact of the lack of education and financial knowledge.

In the context of Latin America, there are studies like Roa (2013) that have shown financial inclusion low in terms of access, use and quality, unlike developed countries. However, it is at the same level common to emerging economies, where there are high commissions for loans, deposits and, above all, geographical barriers that impede access to a formal financial system. Likewise, Contreras-Rodríguez *et al.* (2016) refers that financial education is desirable for financial inclusion, but it is not the only factor that influences it. The study asserts that inclusion is a universal access of people to the products offered by a given financial system; consequently appropriate conditions must also be provided by financial institutions so that the population has a greater possibility of accessing their services and products.

On the other hand, a study conducted by the National Council for Financial Inclusion argues that in Mexico there were no indicators measuring the level of financial education; but in 2010 the National Commission for the Protection and Defense of Users of Financial Services (CONDUSEF) and the National Banking and Securities Commission (CNBV) participated in a project together with other countries to measure financial capabilities and found that 70% of the surveyed population plan their expenses and the remaining 30% do not plan their expenses. This is evident in having a lower and disproportionate financial education.

In Mexico, the Development Bank has implemented innovative programs for micro, small and medium enterprises to enter the formal financial system, through guarantees in most cases, since otherwise they would not have institutional financing (Leucona, 2017). It is broadly accepted that the primary role of financial inclusion in developing countries must focus on serving a large part of its population. Companies that do not have access to formal financial services should expand their network of banks, improve the availability of ATMs, reduce high costs for services or bank loans as much as possible (Morgan and Pontines, 2014). Otherwise, the counterpart of financial inclusion is that it becomes more vulnerable to people and companies when they do not have access to formal financial systems (Demirguc-Kunt and Klapper, 2012).

3. METHODOLOGY DESIGN

This empirical study is of non-experimental design, since the independent variables are not manipulated. The cut is transversal, since the obtaining of the data is done in a single moment of the study. It is also descriptive and explanatory, since it identified the set of underlying variables that explained the knowledge, use and application of financial topics on *Telebachillerato* students.

3.1. Population and Sample

Our key informants were students who had completed their studies in a community *Telebachillerato* in the region of Veracruz. It was therefore important to explain financial inclusion as an academic option, and make students aware of its characteristics. The significance of this study precisely lies in the argument to find out whether the *Telebachillerato* population could provide valuable information required for this research study and could make suggestions or improvements in the curricula in the form of training of financial matters, instruments and services.

The *Telebachilleratos* Community was created by the Government of Mexico through its Public Education Office. It was constituted as an academic option of higher secondary education and whose purpose was to bring educational services to rural communities having less than 2,500 inhabitants. This option also focused on those geographically remote regions who do not have high schools and are located in remote rural areas. (Dirección General del Bachillerato DGB, 2018).

The main objective of such an academic initiative was to be able to contribute to national coverage in the subject of upper secondary education. Fortunately, its educational model was more inclusive having other benefits as well such as saving time and money in transporting of students from rural communities. In Figure 1 is exhibited the evolution of *Telebachilleratos* in Mexico:

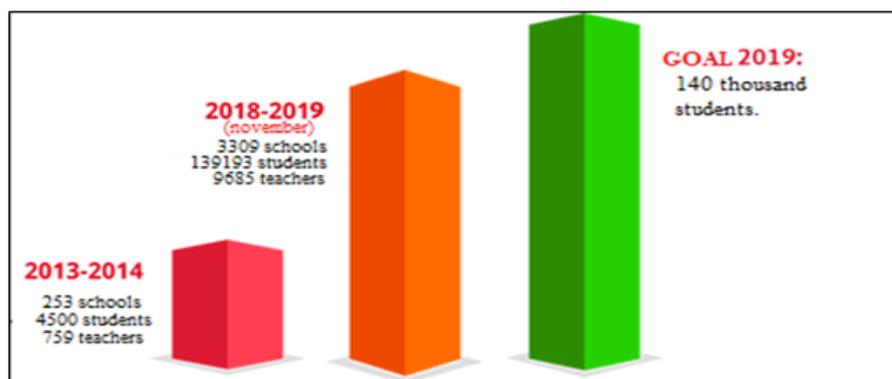


Figure-1. High school subsystem evolution (taken from community *Telebachilleratos*).
 Source: Subsecretaría de Educación Media Superior (Mexico Government Office)
<http://www.sems.gob.mx/Telebachilleratos#crecimiento>.

From this population, a non-probabilistic sample was conveniently selected, since it was possible to have direct contact with the educational authorities of the school who allowed all current students who were present at the time of application to respond to the instrument. The total number of students surveyed was 368 of different technical courses offered by the school. It should be noted that students surveyed were supervised by the teacher in turn and by the personnel who applied the test for correct responses.

3.2. Instrument

For this study a survey designed by Contreras-Rodríguez *et al.* (2017) called Test on Financial Education was used which showed an internal consistency Cronbach's alpha of 0.78. The survey consisted of 34 items in Likert-type scaling that goes from totally in agreement to totally in disagreement. The items were grouped into four large dimensions namely (i) income, (ii) money management, (iii) savings and investment, and (iv) expenditure and credit. Except the first dimension of income, all other three were subdivided into two sub-dimensions of knowledge and use and application (Table 1). There were also questions to collect the socio demographic profile of respondents.

Table-1. Variable, dimension and instrument indicators.

Variable	Dimension	Sub-dimension	Code	Indicators
Financial education and financial inclusion	Income		INCOME	Ítem 1 to 7
	Money management	Knowledge	MONMAKNOW	Ítem 8 to 11
		Use and application	MONMAUSE	Ítem 12 to 15
	Saving and investment	Knowledge	SAVINKNOW	Ítem 16 to 19
		Use and application	SAVINUSE	Ítem 20 to 23
	Expenditure and credit	Knowledge	EXPCREKNOW	Ítem 24 to 29
Use and application		EXPCREUSE	Ítem 30 to 31	

Source: Contreras-Rodríguez *et al.* (2017).

3.3. Validation of the Test by Cronbach's Alpha

To measure the internal consistency of the test we used the Cronbach's alpha coefficient, to check if the instrument collected reliable information that allowed stable and consistent measurements. Cronbach's alpha is a coefficient that measures the homogeneity of the questions by averaging all the correlations between all the items. As a theoretical criterion, it is sought to obtain those values closer to 1 for greater reliability, values being respectable from 0.80 although > 0.7 is accepted according to the criteria of Hair *et al.* (1998). Thus, Cronbach's alpha can be established as a function of the number of items and the average of the correlations between the items:

$$\alpha = \frac{N * \bar{r}}{1 + (N - 1) * \bar{r}}$$

N = number of items, \bar{r} = average correlation between items.

The results of the processed cases are shown in Table 2:

Table-2. Global reliability statistics by elements and dimensions.

Cronbach's alpha		Number of cases	%	Alpha
Valid cases	Excluded(a)	368	100%	.859 with 42 elements
		0		8 sociodemographic profile
	Total	368		34 Likert items

an Elimination based on all the procedure variables.

Source: based on the findings of this research.

The value of 0.8588 normal and 0.8515 standardized is very acceptable considering the theoretical criterion $AC > 0.8$ (Hair *et al.*, 1998) hence we can say that the instrument meets the characteristics of internal consistency and reliability required for this case, so its validity is confirmed.

3.4. Validation of the Assumption of Normality

To test the assumption of data normality, the results of the Kolmogorov-Smirnov test for 1 sample are shown in Table 3:

Table-3. Normality Test K-S for one sample.

Variables		1	2	3	4	5	6	7
N		368	368	368	368	368	368	368
Normal Parameters ^{a,b}	Mean	27.809	15.413	16.364	15.203	13.744	21.638	16.701
	Standard Deviation	4.736	3.210	3.004	2.873	3.505	4.602	4.298
Maximum Extreme Differences	Absolute	.105	.143	.134	.135	.087	.105	.062
	Positive	.065	.077	.113	.070	.051	.052	.055
	Negative	-.105	-.143	-.134	-.135	-.087	-.105	-.062
Statistical test		.105	.143	.134	.135	.087	.105	.062
Asymptotic. sig. (bilateral)		.000 ^c	.002 ^c					

INCOME (1), MONMANKNOW (2), MONMANUSE (3), SAVINKNOW(4), SAVINUSE (5), EXPCREKNOW(6), EXPCREUSE (7)

a) The contrast distribution is Normal. b) They have been calculated from the data. c. Lilliefors significance correction.

Table 3 exhibits that the asymptotic significance has values lower than 0.05 in all seven variables, so we can say that the variables that explain the level of financial education in *Telebachillerato* students do not follow a normal distribution.

Table 4 presents the result of the randomness test shown by the test of runs using the average as the test value and the Z value with the asymptotic significance by variable.

Table-4. Normality test with the mean test.

Streaks test	1	2	3	4	5	6	7
Test value ^a	27.809	15.413	16.364	15.203	13.744	21.638	16.701
Cases < test value	156	158	167	184	166	157	173
Cases >= test value	212	210	201	184	202	211	195
Total cases	368	368	368	368	368	368	368
Number of streaks	164	175	198	183	160	167	163
Z	-1.789	-.674	1.534	-.209	-2.450	-1.498	-2.236
Asymptotic. sig. (bilateral)	.074	.500	.125	.835	.014	.134	.025

a. mean.

INCOME (1), MONMANKNOW (2), MONMANUSE (3), SAVINKNOW(4), SAVINUSE (5), EXPCREKNOW(6), EXPCREUSE (7)

To test the normality of the data, the streaks test was performed with the mean, where the result shown in Table 4 was obtained, which indicates that in 5 of the 7 variables the data were normal, that is, the variables INCOME (1), MOMANKNOW (money management knowledge) (2), MONMANUSE (money management use

and application) (3), SAVINKNOW (save and investment knowledge) (4) and EXPCREKNOW (expenditure and credit knowledge) (6) come from data with a normal distribution (> 0.05), not so SAVINUSE (save and investment use and application) (5) and EXPCREUSE (expenditure and credit use and application) (7) whose values are < 0.05

4. DATA ANALYSIS

From the analysis made to the data matrix, the frequencies obtained were first described in relation to the variables of the sociodemographic profile of the students surveyed, such as gender, level of study, school grade, age, location, type and use of computer networks (applications) and the time of use, which are shown in Table 5.

Table-5. Sociodemographic profile of the population.

Variable	%	Variable	%	Variable	%
Gender		Study level		Grade	
Male	60	JHS*		1° JHS	0
Female	40	HS**	100	2° JHS	0
∑	100%	∑	100%	3° JHS	0
				1° HS**	25
Age		City		3° HS	18
From 12 to 15	0	Veracruz	100	5° HS	57
>15 <to 20	70	Jamapa		1° University	0
>20 <to 23	29	∑	100%	3° University	0
> 23 <to 30	1			5° University	0
> 30	0			7° University	0
∑	100%			∑	100%
Social networks	%	Use of social networks		Frequency	
Facebook	5	Yes	99	daily	89.7
Twitter	0	No	1	+3 times a week	6.3
Instagram	0	∑	100%	-3 times a week	3.3
Youtube	2			Never	.5
Internet in general	24			Lost data	.2
More than 3	40			∑	100%
3 or less	29				
∑	100%				
				*Junior high school	
				**High school	

The characteristics that describe the sociodemographic profile of the surveyed population can be seen in Table 5, where the following is detailed: the surveyed population of 368 students corresponds to high school students in the region of the Port of Veracruz, of which 60 % are men and 40% women, whose ages range from >15 to 20 years in 70% of cases, followed by >20 to 23 years 29% and only 1% are in the age range of >at 23 to 30.

Other important data refers to the type of computer networks or applications at their use and the time that students dedicate to, since *Telebachilleratos* use technology for this purpose only. In relation to the use of social networks, 99% of the cases said they had the network, 40% said they had more than three types of networks, followed by 29% who said that they had the same or less than three and 24% only referred to the internet network in general and finally, almost 90% use the network daily.

However, considering that the data matrix showed an internal consistency ($\alpha > 0.8$) and of the 7 analyzed variables 5 of them showed asymptotic significance > 0.5 Table 4 is justified to perform the exploratory factorial analysis to corroborate whether the matrix of data offers an acceptable factorial solution. Table 6 presents the result of Bartlett's Sphericity test with Kaiser and the Chi square test. Table 7 shows the values of the correlation matrix and the value of the determinant, with the measure of sample adequacy by variable (MSA).

Table-6. Bartlett's sphericity test with KMO, X2 and next.

Kaiser-Meyer-Olkin sampling adequacy		.849
Bartlett sphericity test	Approx. Chi-square	716.280
	df	21
	Sig.	.000

Table-7. Correlation matrix and sample adequacy measure (MSA).

Correlation	1	2	3	4	5	6	7	MSA
INCOME (1)	1.000							.826 ^a
MONMANKNOW(2)	.475	1.000						.853 ^a
MONMANUSE (3)	.568	.404	1.000					.844 ^a
SAVINKNOW (4)	.539	.389	.472	1.000				.870 ^a
SAVINUSE (5)	.324	.182	.290	.381	1.000			.848 ^a
EXPCREKNOW (6)	.392	.295	.370	.392	.393	1.000		.886 ^a
EXPCREUSE (7)	.383	.177	.260	.430	.420	.376	1.000	.823 ^a

^a Determinant = .140.

INCOME (1), MONMANKNOW (2), MONMANUSE (3), SAVINKNOW(4), SAVINUSE (5), EXPCREKNOW(6), EXPCREUSE (7)

The result of Bartlett's spherical test with Kaiser (.849) is acceptable in theoretical terms (Hair *et al.*, 1998) in addition to the value of Chi square of 716.280 with 21 degrees of freedom exceeding the value of tables of 11,591 with significance .05 and 10.283 with $\alpha / 2$ (.05 / 2), so the null hypothesis is rejected. Table 6 also presents the value of the determinant (d) gives evidence of positive correlations in all cases.

The sample adequacy measures by variable (MSA) shown in Table 7 run in a range of 0.823 to 0.886a which in theoretical terms (> .5) is very acceptable and gives evidence for the rejection of the null hypothesis. .

Derived from the extraction method used, Table 8 and 9 present the conformation of two components with the corresponding factorial weights and communalities for each variable, which reflects the eigenvalue of each component that in sum represents the total value of the variance that explains the phenomenon that is studied.

Of the components extracted by the criterion of eigenvalues > 1, two components with eigenvalues 3.290 and 1.026 are obtained, representing 46.99% and 14.65% respectively, whose sum is 61.65% of the assimilated variance. In the first component, the most significant factorial weight on the income variable (.788) is observed, followed by SAVINKNOW (.768), which obviously contributes with greater weight to the variance, but in general 7 variables contribute with an eigenvalue of 3,290 that represents almost 47% of the total of 61.65% of the variance that throws the data matrix studied.

In the same manner, the components extracted by the factor criterion were analyzed, using the loads >.40 for the purpose of identifying those indicators that contribute the most in each component (Table 10). The particularities of each item or indicator allowed identifying the conformation in the specific dimensions of knowledge as well as the use and application of the variables associated with money management, savings and investment and finally spending and credit.

Table-8. Component matrix a^{*}.

Variables	Component		Communalities (Ψ)		
	1	2	1	2	Σ
INCOME	.788	-.253	0.621	0.064	0.685
MONMANKNOW	.603	-.534	0.363	0.285	0.649
MONMANUSE	.716	-.329	0.512	0.108	0.620
SAVINKNOW	.768	-.022	0.590	0.000	0.591
SAVINUSE	.607	.518	0.369	0.268	0.637
EXPCREKNOW	.666	.217	0.444	0.047	0.491
EXPCREUSE	.625	.503	0.390	0.253	0.643
Eigenvalues			3.290	1.026	4.315
Variance			46.994	14.652	61.646

Extraction method: Main components analysis. ^a 2 extracted components.

Table-9. Total variance explained.

Component	Initial eigenvalues		
	Total	% de variance	% accumulated
1	3.290	46.994	46.994
2	1.026	14.652	61.646
3	.646	9.226	70.872
4	.593	8.469	79.342
5	.576	8.229	87.570
6	.475	6.786	94.356
7	.395	5.644	100.000
Square load extraction			
Total	% de variance		% accumulated
3.290	46.994		46.994
1.026	14.652		61.646

Extraction method: Main components analysis.

Table-10. Component matrix^(a) by items.

Indicators	Component		
	1	2	3
INCOMAU02	0.643		
INCOMAU01	0.636		
MONMANUSE03	0.623		
INCOMAU07	0.570		
EXPCREKNOW04	0.553		
MONMANKNOW01	0.550		
SAVINKNOW02	0.531		
SAVINKNOW04	0.510		
SAVINKNOW01	0.499		
EXPCREUSE01	0.498		
MONMANUSE04	0.498		
INCOMAU03	0.496		
MONMANKNOW04	0.495		
INCOMAU04	0.477		
EXPCREKNOW03	0.476		
INCOMAU05	0.465		
SAVINUSE04	0.461		
MONMANUSE02	0.451		
SAVINKNOW03	0.427		
EXPCREUSE05	0.423		
MONMANUSE01	0.416		
SAVINUSE03	0.414		
EXPCREKNOW06	0.403		
EXPCREUSE03		0.578	
EXPCREUSE04		0.533	
EXPCREKNOW01		0.529	
SAVINUSE02		0.500	
SAVINUSE01		0.431	
EXPCREKNOW02			0.557

* Extraction method: Main components analysis. * 3 components extracted by loads > .4

**Excluded indicators by loads < .4 INCOMAU06, EXPCREKNOW05, MONMANKNOW02, MONMANUSE03, EXPCREUSE02.

5. DISCUSSION AND FINAL REFLECTIONS

Having obtained the results, the next step was to carry out a discussion on the findings: First, the big research question was to establish the central objective of the study about the explanation of how students perceive some financial topics. This main conjecture was about the existence of an underlying factorial structure that allows to measure perception and knowledge.

In this way the analysis yielded a value of (716,280 with 21 gl vs. 32.6706) which gave evidence for the rejection of the null hypothesis. This data and the value of the KMO justified the pertinence to carry out the factorization through the AFE. The normality of the data in the Kolmogorov-Smirnov test for a sample did not

present asymptotic significances greater than 0.5 that validated the assumption of normality, so it was necessary to calculate the assumption of randomness with the test of runs of the mean, finding normality in 5 of the 7 variables. In addition, positive correlations in all cases with a relatively low determinant and MSA greater than .8 supported the use of factorial technique.

In this order of ideas, when extracting the components by the criterion of eigenvalues > 1 , three factors were obtained, which are analyzed and discussed below:

For factor 1, indicators of the variables income, savings and investment, money management, spending and credit of the last three variables in the knowledge modality, as well as use and application, which leads us to think that the underlying structure to understand the phenomenon of financial education from the perception of use and application, can be explained by at least one factor. In addition, in the extraction of the components the criterion of factorial loads $> .4$ was followed; consequently the matrix of the extracted factors was determined to be robust and explained the greater percentage of the variance.

For factor two, the number of indicators was already reduced, that is, only the items of spending and credit, as well as savings and investment, had charges > 0.4 , both in the use and application modality. These variables were closely related to each other, considering that the savings and investment culture was subject to cash availability of subjects. One might think that in the absence of a surplus for savings and investment it is common to resort to credit to cover some expenses. In this regard, these findings are consistent with that of [Danes and Hira \(1987\)](#) who showed that regardless of the training of students, when you have a lack of knowledge on financial issues, they could hardly have an adequate management of their personal finances. However, the knowledge acquired throughout their lives is also very important, especially which they obtain within the family.

Finally, factor three integrated a single indicator on spending and credit; in this indicator the students surveyed reported having a plan to face a contingency when the expenses exceeded the income. This data was interesting, since the item EXPCREKNOW02 corresponded to the knowledge dimension, and factor two integrated two indicators that corresponded to the use and application of spending and credit, specifically in the use of services such as bank credit and transactions in department stores. This also has serious connotation with the work of [Wydick et al. \(2011\)](#) who report that in developing countries, there are few households that have access to formal sources of credit, speaking of institutions of the financial system, hence most people turn to credit or informal loan from friends, family or lenders.

From the results we can point out that there is a positive perception of the students towards the financial topics that are analyzed, for example in the matter of income, it shows a clear conviction that with a university degree they will improve their income. In addition, extracurricular courses were perceived as another potential source to improve their income. The findings of [Hanning and Jansen \(2010\)](#) are consistent with this finding, since it refers to the importance of financial inclusion as a development bridge that also seeks to reduce poverty, and on the other hand the student studies in classrooms with the full conviction that his future will be able to improve.

The results indicate that students are aware of the importance of managing money and that they consider that a percentage of income should be set aside to be used for savings, for instance, to pay for car insurance and to face possible medical expenses. In summary, it can be argued that students agree to carry an adequate administration of money, although it would be worth exploring in the future if they could do so as soon as they enter their jobs.

This is not consistent with what [Wernimont and Fitzpatrick \(1972\)](#) referred to as an issue of money management and the way in which the population perceived it. In their study they sought to determine the possible differences between sectors in which people grew up. The results revealed two major issues: first, a large number believed that money was a tool for success and required for the development of any activity; second, a lower percentage regarded money as a negative factor, since it is likely that people resort to unethical or moral acts to obtain the money. Finally, it was concluded that regardless of the social value that money may have, it is a factor of anxiety and worry when one does not have it.

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Annexures

Table-10.1. Components matrix^(a) excluded items.

Indicators	Component		
	1	2	3
INCOMAU06	0.385	-0.025	-0.270
EXPCREKNOW05	0.384	-0.011	0.255
EXPCREUSE02	0.352	0.062	-0.218
MONMANKNOW03	0.257	-0.184	0.185
EXPCREUSE02	0.339	0.344	-0.108

Table-10.2. Correlation matrix.

Variables	Medidas	1	2	3	4	5	6	7
INCOME	Correlación de Pearson	1	.475(**)	.568(**)	.539(**)	.324(**)	.392(**)	.383(**)
	Sig. (bilateral)		0	0	0	0	0	0
	N		368	368	368	368	368	368
MONMANKNOW	Correlación de Pearson		1	.404(**)	.389(**)	.182(**)	.295(**)	.177(**)
	Sig. (bilateral)			0	0	0	0	0.001
	N			368	368	368	368	368
MONMANUSE	Correlación de Pearson			1	.472(**)	.290(**)	.370(**)	.260(**)
	Sig. (bilateral)				0	0	0	0
	N				368	368	368	368
SAVINKNOW	Correlación de Pearson				1	.381(**)	.392(**)	.430(**)
	Sig. (bilateral)					0	0	0
	N					368	368	368
SAVINUSE	Correlación de Pearson					1	.393(**)	.420(**)
	Sig. (bilateral)						0	0
	N						368	368
EXPCREKNOW	Correlación de Pearson						1	.376(**)
	Sig. (bilateral)							0
	N							368
EXPCREUSE	Correlación de Pearson							1
	Sig. (bilateral)							
	N							

** Correlation significance level 0,01 (bilateral)

INCOME (1), MONMANKNOW (2), MONMANUSE (3), AHOINCO SAVINKNOW(4), SAVINUSE (5), EXPCREKNOW(6), EXPCREUSE (7)

Table-10.3. Test indicators reliability.

Summary for scale: Mean=147.410 Std.Dv.=18.3528 Valid N:368 (Spreadsheet1-Ed Fin paper 2018)
Cronbach alpha: .858846 Standardized alpha: .851492 Average inter-item corr.: .122332.

	Mean if - deleted	Var. if - deleted	StDv. if - deleted	Itm-Totl - Correl.	Alpha if - deleted
GENDER	146.011	335.891	18.327	-0.012	0.860
AGE	145.095	334.097	18.278	0.078	0.859
STUDY LEVEL	144.889	332.523	18.235	0.170	0.858
GRADE	142.033	331.580	18.209	0.100	0.860
LOCATION	146.400	335.832	18.326	0.010	0.859
NETWORKS USE	146.405	336.056	18.332	-0.056	0.859
NETWORKS TIPE	141.663	331.669	18.212	0.047	0.863
TIME USE	146.253	334.808	18.298	0.033	0.860
INCOMAU01	142.924	316.478	17.790	0.523	0.852
INCOMAU02	143.212	316.042	17.778	0.552	0.852
INCOMAU03	143.408	318.258	17.840	0.407	0.854
INCOMAU04	143.321	320.289	17.897	0.399	0.855
INCOMAU05	143.652	319.509	17.875	0.401	0.854
INCOMAU06	143.780	318.895	17.858	0.330	0.856
INCOMAU07	143.766	314.272	17.728	0.494	0.852
MONMANKNOW01	142.981	318.785	17.855	0.441	0.854
MONMANKNOW02	143.946	321.187	17.922	0.315	0.856
MONMANKNOW 03	143.921	323.295	17.980	0.208	0.859
MONMANKNOW 04	143.380	316.899	17.802	0.396	0.854
MONMANUSE01	143.375	318.908	17.858	0.340	0.856
MONMANUSE 02	143.470	320.157	17.893	0.357	0.855
MONMANUSE 03	143.283	315.725	17.769	0.527	0.852
MONMANUSE 04	143.150	319.747	17.881	0.402	0.855
SAVINKNOW01	143.454	317.992	17.832	0.428	0.854
SAVINKNOW 02	143.204	318.391	17.844	0.431	0.854
SAVINKNOW 03	144.035	318.181	17.838	0.411	0.854
SAVINKNOW 04	143.745	317.609	17.822	0.457	0.853
SAVINKNOW 01	144.280	318.647	17.851	0.300	0.857
SAVINKNOW 02	144.484	319.315	17.869	0.274	0.858
SAVINUSE03	143.522	318.771	17.854	0.357	0.855
SAVINUSE04	143.611	315.928	17.774	0.433	0.854
EXPCREKNOW01	144.079	320.105	17.891	0.277	0.857
EXPCREKNOW 02	143.728	319.013	17.861	0.355	0.855
EXPCREKNOW 03	143.775	316.642	17.794	0.417	0.854
EXPCREKNOW 04	143.720	314.430	17.732	0.502	0.852
EXPCREKNOW 05	143.739	319.323	17.870	0.331	0.856
EXPCREKNOW 06	143.783	318.181	17.838	0.356	0.855
EXPCREUSE01	143.348	315.933	17.775	0.434	0.854
EXPCREUSE 02	144.264	318.667	17.851	0.317	0.856
EXPCREUSE 03	144.516	319.380	17.871	0.270	0.858
EXPCREUSE 04	144.541	317.227	17.811	0.298	0.857
EXPCREUSE 05	143.682	316.065	17.778	0.375	0.855

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