Financial Education Of Young Mexicans: An Approach From The Perspective Of Complex Thinking

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Abstract
This study analyses young people's knowledge and attitudes related to investment and how complex thinking determines their investment strategies. Mixed methods and statistical analysis were used to explore the sociodemographic variables, financial literacy, and reasoning for complexity. 225 young people between 17 and 24 years of age were interviewed at high school and university levels with focal groups in five Mexican cities. The results suggest that there is an opportunity to develop financial literacy programs and complex thinking that improve financial literacy training processes. This article can be valuable to encourage the decision-making of new generations confronting their financial lives.
Keywords: financial education, investment, financial risk, complex thinking, lifelong learning, educational innovation, higher education

INTRODUCTION

The situation of youth in Latin America is becoming more complex and disappointing every day due to a lack of educational and economic opportunities. According to the International Labor Organization (ILO) (2022), the number of unemployed young people in 2020 was about 73 million around the world. In Mexico, the political and social situation, and criminal violence are key to the youth employment situation (Cáceres, 2020; Juárez et al., 2022). The COVID-19 pandemic worsened the complex financial situation and revealed their lack of knowledge of personal finance, which prevents responsible and competent decision-making for personal management (Cáceres, 2021; Ghecham, 2022; Kaiser et al., 2022). Financial education is also a necessary process for improving people's situations under the special conditions of the post-pandemic period that we are currently experiencing as of the time of writing.
Financial education should be considered crucial by people at their academic training. In 2021, 20.9% of young people between 15 and 29 years of age in Mexico were not

connected to any education scheme, work training, and/or work relationships (Ispierto et al., 2021); this adds to the lack of acquisition of elementary concepts of personal finance (Hernández-Mejía et al., 2021). Other countries in the region, such as Chile (23.4%), Costa Rica (25.9%), and Colombia (27.1%), have even higher figures (Corporación Andina de Fomento, 2020; Organisation for Economic Co-operation and Development, 2015, 2022), leading to which is associated with the inadequate use of different types of credit, forms of investment and savings in this age group (Klapper & Lusardi, 2020). Financial education studies recurringly reveal financial literacy gaps in the youth population. (Morgan & Trinh, 2019; Ramos-Hernández et al., 2020). Therefore, we are facing a great challenge not only for governments and public policy makers but also for societies in general.

Given the disappointing situation of young Latin Americans, alternatives for designing policies and programs that seek to generate new and better job opportunities have arisen. According to the ILO (2020), entrepreneurship and labor formalization contribute to post-pandemic recovery. However, some authors (Cucinelli et al., 2019; Dewi, 2022; Salas-Velasco et al., 2021) pointed out that different determinants of the financial situation are evident according to population groups and social contexts. The acquisition of the skills needed to confront crises caused by a lack of opportunities increases the need to become educated in a constant and adaptive way (Engels et al., 2020; Gang and Singh, 2018). This study aims to analyze the attitudes, behaviors, and knowledge of young Mexicans in relation to the use of money for investment and economic stability from the perspective of complex thinking.

Financial Education

With the development and evolution of the consumer markets, citizens require skills for personal development. Literature has shown a link between lifelong learning and the development of soft skills (Bohorquez, 2020). International organizations, such as the Organisation for Economic Co-operation and Development (OECD) (Ferrada et al., 2020), have highlighted the need to acquire knowledge to improve attitudes and apply these understandings to different financial contexts effectively given people's search for individual and social economic well-being. Different studies have highlighted that from a more academic perspective, the lack of a conceptual definition of the financial education construct is the main barrier in developing a standardized approach to the measurement of financial education (Aprea et al., 2016; Salas-Velasco et al., 2021; Thomas & Subhashree, 2020). Recent reports have used related terms such as "money management knowledge" or "financial knowledge" (García Mata et al., 2021; Kaiser et al., 2022). Thus, it is understood that research about measuring aspects such as credit card knowledge, insurance, personal loans, and financial management in general is necessary.

Financial knowledge, individual behavior in the face of economic changes, and attitudes toward savings and investment are related to socio-economic well-being in the medium and long term. Technically, investments can be considered as the way to save current resources for the future by using means such as savings accounts, stocks, bonds, and investment funds (Abeles & Pérez Caldentey, 2022; Deuflhard et al., 2019). Despite this panorama, it continues to be observed that financial education is deficient in young people (Grifoni et al., 2020) and that personal investment decisions are therefore deemed inappropriate, which has a direct impact on people's quality of life (Ispierto et al., 2021).

The reported experiences show that the greatest impacts are achieved by creating spaces that motivate reflection on developing financial skills to overcome small investment actions and to foster a culture of savings and investment (Rodríguez Magaña et al., 2020). The strategies that stimulate the interaction of young people with banks are efficient for advancing the field of financial education, a situation that is still distant for Mexico (Mungaray et al., 2021); thus, people should be motivated to generate interaction with financial entities (Larraz et al., 2019), and public policies according to the recommendations of organisms such as the OECD and the Development Bank of Latin America (CAF) should be established. Bad decisions about personal economics can generate a high risk of capital loss, excessive indebtedness, and, in the most extreme cases, financial exclusion.

Although age is a vital factor in improving financial education indexes, as has been recently shown, other factors should be evaluated to kimprove different indicators. Venkataraman & Venkatesan (2022) have warned that economic income is key when determining savings attitudes toward financial planning, and that can also limit the tools that young people count on to assume their finances with relative responsibility. Guzmán-Fernández (2022) and Hernández Rivera (2019) found that, more than age, training, and knowledge levels significantly determine financial behavior. Décaro-Santiago et al. (2020) argued that didactic strategies should be the starting point for improving financial education indexes, a notion that had already been highlighted a decade ago (Atkinson & Messy, 2012). In this sense, financial education is considered more important, beginning with notions more appropriate to the pedagogical field.

Complex Thought

The citizen competences of the 21st century is developed and facilitated by the ability to perform complex thought processes for personal and professional wholesomeness. The reasoning paradigm for complexity and the proposal of complex thought coined by Morin (2010) have caused the epistemic notion of the postulates of knowledge and learning to be questioned. Complex thought as a basis for financial education allows the rethinking of the epistemic bases of young people (Delgado Díaz, 2019). Ramírez Montoya et al. (2021) and Vázquez-Parra et al. (2023) proposed that citizens be educated based on critical, scientific, systemic, and entrepreneurial thinking, a task that can be assumed clearly and effectively through complex thinking. Therefore, financial decisions are achieved as a process that involves overcoming the instincts, intuitions, or experiences of others (Shefrin, 2000). This takes in the rational and analytical categories of observation, reflection, and reasoning (Patiño et al., 2023). Reforming thought includes transforming institutions and multilateral organizations in order to promote education that is in line with the needs of contemporary society (Delgado Díaz, 2019; Ramírez-Montoya et al., 2022; Suárez-Brito et al., 2022). Complex thought can articulate fragmented knowledge in different disciplines or fields of knowledge, which makes it possible to deepen specific aspects of knowledge of reality (Morin 2010). Under the concept of financial education, the proposal of complex thought makes one question oneself about their concept of specific knowledge in the distribution, control, and accumulation of money.

The Mexican Case in Financial Education

National governments have prioritized the task of evaluating and monitoring the situation of the different populations; Mexico has been no exception to this trend toward

financial education. In 2021, the National Banking and Securities Commission (CNBV) and the National Institute of Statistics and Geography (INEGI) carried out the National Financial Inclusion Survey (ENIF). The findings of García Mata et al. (2021) similarly showed that for young people between the ages of 18 and 23, only 52.8% mentioned taking attitudes oriented toward savings and calculating before spending. A possible cause of the proximity or remoteness of young people to financial education processes may be related to their dependence on the constant modernization of the financial sector and the barriers to accessing it (Mungaray et al., 2021). Studies have shown that without the right knowledge and incentives, there is no optimal and responsible way to use financial services (Bolaños et al., 2021; Cruz León et al., 2019). This allows not only a characterization of the situation of young Mexicans in the face of this phenomenon, but also provides a clear and relevant framework of the advances and challenges that must be addressed by the different institutions of Mexican society in education and financial literacy.

DESIGN AND METHODS

This study is descriptive-explorative and uses a mixed approach. Open group interviews were carried out with focal groups located in Mexico City, Monterrey, Querétaro, Hidalgo, and Guadalajara. The sample was obtained by convenience sampling. The interviews carried out with each focal group featured questions aimed at exploring the specific categories: knowledge, attitudes, and behavior, all of which make up complex thinking. The questions are aimed at exploring their ability to analyze financial subjects based on their previous knowledge, and how such an analysis leads the interviewees expressing themselves about their investments, risk control, and the returns from different financial options. Figure 1 shows the structural design of this study and the questions analyzed during its development.

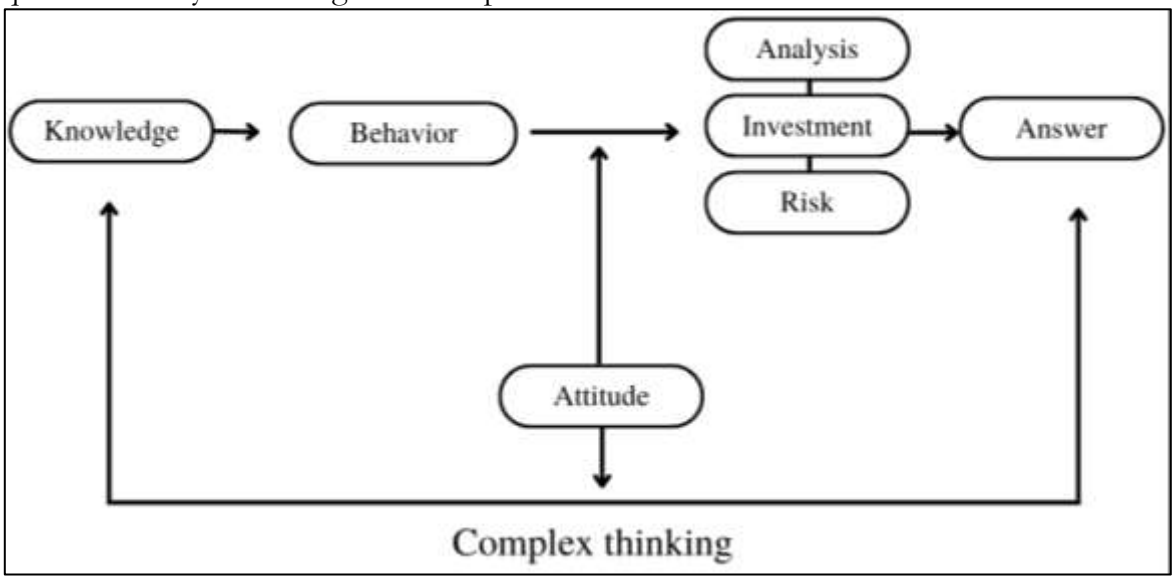

Figure 1. Dependent variables within the investment framework.

Since one of the main objectives of higher education is to develop complex thinking as a fundamental competence for the 21st century (Patiño et al., 2023), we have designed this study based on the conditions represented in Figure 1. The questions were designed

to identify the students' level of complex thought development by assessing their knowledge and how they integrate their knowledge holistically into investment behaviors. This lets us evaluate the situation of young people and their attitude toward the different options that students have with their current economic means from three perspectives (analysis, knowledge about investments, and the rating they give to financial risks) and in hypothetical scenarios.

This information was systematized and codified from two analysis variables: **I) Independent variables** that contain sociodemographic data, such as educational level, age, whether the institution was public or private, and city; and **II) dependent variables** with financial literacy criteria (knowledge, financial attitudes, and behavior) and complex thinking (dialogue, recursiveness, and the application of the principle of the part in the whole and the whole in the part).

Development

Meetings with each focal group were conducted in an assertive manner, seeking to generate a friendly atmosphere in which the questions were asked in a conversational rather than interrogatory manner to achieve the greatest possible truthfulness in the answers. Because of the above, the questions recorded in the transcripts may vary in form, but the content refers to a series of seven questions: I. What kind of relationship do you have with banks? II. What ways of investing money are you familiar with? III. What strategy do you use when investing? IV. What types of investments do you think are risky? V. What do you know about bank credit services and credit records regarding investment possibilities? VI. What would you do with 1 million MXN pesos; what would you invest it in? and VII. What would you invest your money on?

The students' responses were evaluated on a scale from 1 to 5 based on the following criteria according to the above categories: response coherence, resourcefulness, and the use of honest and accurate elements in their responses. Each response received a rating for each corresponding category, and the average is assigned to the corresponding focal group. From these data, statistical analyses were carried out to explore possible associations between the dependent and the independent variables.

Findings

There were 225 participants in 22 focal groups in 5 Mexican cities and/or states, aged 17 to 24. Table 1 shows the place, type of institution, level of study, age range, and gender.

Table 1. Characterization of the population.

Place	Kind of institution	Sex (%)			Level of study	Sex (%)			Age range	Sex (%)		Total Population
		Male	Female	Total		Male	Female	Total		Male	Female	
Mexico City	Private	24 %	21%	34	University	38 %	29%	34	17–20 years	29 %	24%	15%
	Public	32 %	24%		High School	18 %	15%		21–24	26 %	21%	

									years			
Guadalajara	Private	27 %	31%	49	University	55 %	45%	49	17–20 years	0%	0%	22%
	Public	29 %	14%		High School	0%	0%		21–24 years	55 %	45%	
Hidalgo	Private	14 %	14%	29	University	10 %	21%	29	17–20 years	31 %	38%	13%
	Public	28 %	45%		High School	31 %	38%		21–24 years	10 %	21%	
Monterrey	Private	62 %	21%	73	University	47 %	18%	73	17–20 years	40 %	33%	32%
	Public	5%	12%		High School	21 %	15%		21–24 years	27 %	0%	
Querétaro	Private	53 %	48%	40	University	10 %	8%	40	17–20 years	43 %	40%	18%
	Public	0%	0%		High School	43 %	40%		21–24 years	10 %	8%	
Total				225				225				100%

Table 1 shows that in Guadalajara, the participant population was concentrated between the ages of 21 and 24; 32.4% in Monterrey, which had the most participants; in Hidalgo and Mexico City, most were from public institutions; and the Querétaro and Hidalgo groups participants were mostly at the preparatory level. Table 2 shows the totals that describe the study population.

Table 2. Description of the population.

Place	**Kind of institution**	**Sex**	**Level of study**	**Age range**

	Private	**Public**	**Male**	**Female**	**University**	**High School**	**17–20 years**	**21–24 years**
Frequency	14	8	128	97	14	8	113	112
Total	22		225		22		225	
Average	Private ≈ (11)		Men ≈ (112)		University ≈ (11)		20–21 years	
Means	Private		Men		University		17–18 years	

As shown in the previous Table, of all focal groups (22), 63.7% correspond to private institutions. There were 97 female participants, 56,89% were men; similarly, most of the young people interviewed were studying at university (63.7% of the focal groups). The questions asked were designed to allow students to respond in a comprehensive, exhaustive, and explanatory manner; however, most gave very short phrases and sometimes a "yes" or "no." Some of the answers obtained are recorded textually in Table 3; specifically, those representatives of the general thinking of the different focal groups.

Table 3. Answers given by the young people interviewed.

Perceptions of participating youth			
Training level (Independent variable)	Investment knowledge (dependent variable)		
	Forms of investment actions		Ways to take investment actions
University	"Real estate." "I, for example, have some money set aside in an investment fund in which you can leave a certain amount and afterwards you obtain a certain benefit from the money." "I think that, governmentally, there is also a fund in which you lend money to the government, and they give it back to you with interest; according to me, what they give you back is the minimum." "Oh, well. The market is also in that area of commercial agreement alongside that of stores; it's different, maybe because of companies that are getting ahead and Bancomer, which has also been investing there."		"I would look at the experience that other people have had, and how they have done with that, well, because it's the same basing yourself on experience or what has happened to other people. Well, there is a higher probability that it'd go well for me than it going badly." "Well, I think that I'd also buy a product, maybe wholesale, and then I'd sell it for a higher price." "Buying stock of certain companies on the internet, and all those things, but in reality is that my knowledge and experience on this subject is like that of a virgin. I desisted and, well, I have a savings account, that's all. It's one of those that only gives you a little bit, they give you, I think, like it's 7% each month." "For example, one kind of investment that banks make is lending money, but they charge a commission, an interest, it's that physically that they make it in the form of investments, it's that what banks do, that is already to be credits. They give them to people, but they give an annual interest".

High School	"Buy a product and make double on it." "For example, in anything, like it's an idea or a project that you know about—well, if there is that kind of investment forums and, well, anything in this life, whether it's new clothes or even food, is considered an investment because, well, it is considered an investment because, well, it's something that you are giving your money for, to have it like a car or almost everything." "I know a couple. There is the classic one in that you put it in a bank as the bank is makes movements to turn a profit, such as 2% annually, which isn't much, but it is something and accordingly it's safe. Also, there is the other that I've heard about where the people buy houses, they wait for the moment that the price of the house goes up, and this last one which is plainly the riskiest: the stock market, it's like that. There, they keep exchanging shares to see if their money grows. It's riskier, I think."		"In real estate, houses." "Local businesses, a food stand". "Stocks, as shareholders of companies." "Well, you invest in the stock market." "When you invest in one business or another that somebody is going to start or somebody invests by giving money in support, and you know that, well, that is going to give you capital to the business for it to start up. It will give it back to you at some point." "Cryptocurrency is similar to the stock market." "Well, I've put money in a company, and the truth is that it's giving me good earnings." "I was going to say, buy company stock. That makes you an owner of part of the company, and they give you royalties." "In a business."

Table 3 shows how students responded to questions related to the subject of the forms or types of investments they knew about and the actions they considered to have some value when deciding to make an investment. Attention, attention is drawn to the fact that as forms of investment, they mentioned real estate, but they do not mention any strategies related to real estate. In the case of business, they recognized bank products and investment funds as basic investment actions.

The key question that allowed the evaluation of each of the components of complex thought within the established categories was that hypothetical situation of having a million Mexican pesos (about 50,000 US dollars) available to invest. While most students responded that they would pay their debts, their families' debts, spend the money on luxuries, or distribute the money among their families, Figure 2 shows the distribution of the responses of those who did mention investment options.

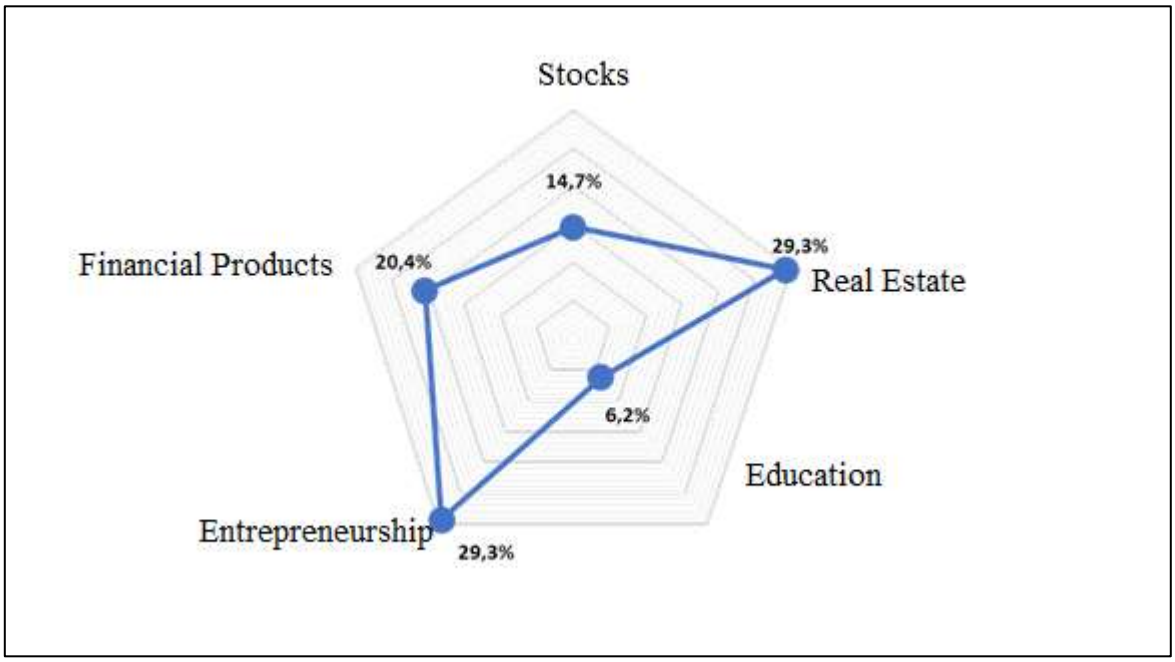

Figure 2. Answers to predictive questioning.

Figure 2 shows that the forms of investment that the young people knew best, or that gave them greater confidence, were those related to entrepreneurship and acquiring real estate at 29.3%, while education had the lowest percentage at 6.2%. As to the corresponding ratings, the general average was 1.98 (DE 0.47). The average of each of the categories was therefore also low: attitude = 1.88 (DE 0.49), behaviors = 2.12 (DE 0.56), knowledge = 1.95 (DE 0.48), and complex thinking = 1.99 (DE 0.41).

When comparing the results by the variable *type of institution,* we found that there were no substantial differences between young people studying in public institutions cand those in private institutions (Figure 3). Statistical tests (mean difference for independent samples by student's t-test) do not reflect statistically significant differences, either.

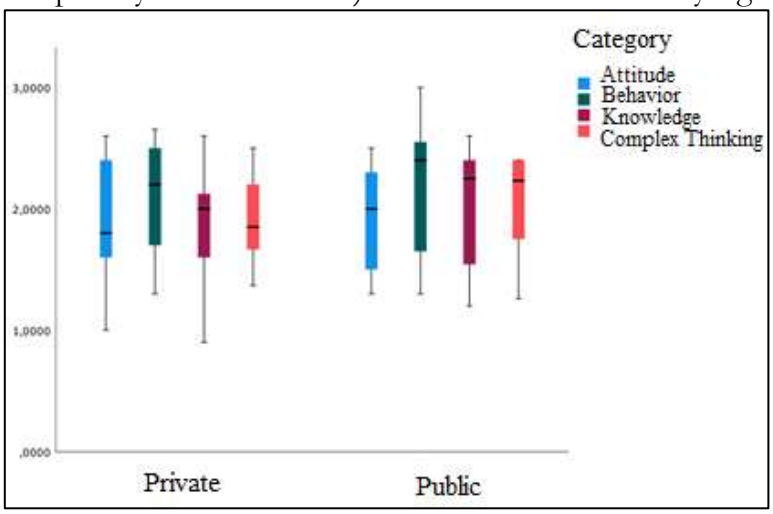

Figure 3. Average grading of each category in private institutions compared to public ones.

Figure 3 shows how the averages varied slightly in all categories for students from public institutions and showed intervals with higher values than in private institutions and with

a low tendency to show low average ratings. It is important to note that only the behavior category had a distribution that crossed the approval rating cut-off point (3.0).
Figure 4 shows the grades grouped by city where the students of each of the focal groups were located.

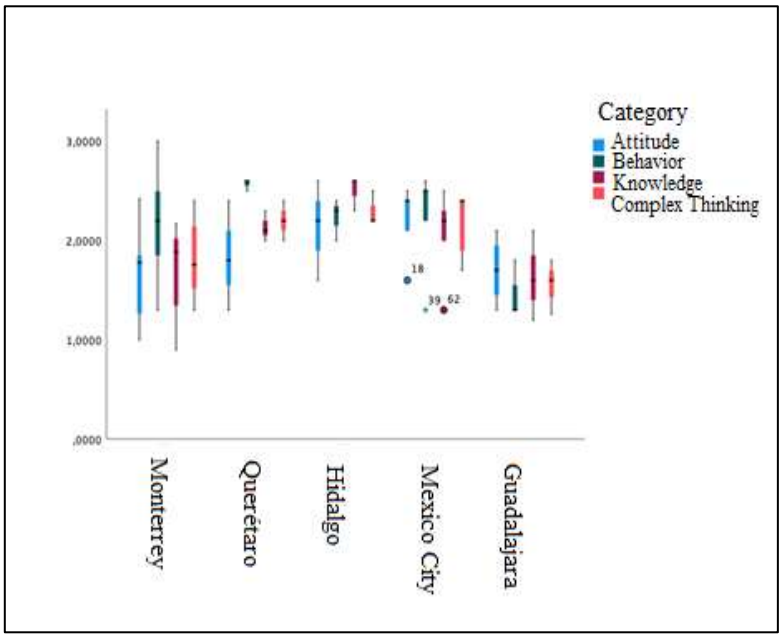

Figure 4. Average rating of each category for the interviewed young people's cities.
The ratings observed in Figure 4 are very close to each other (i.e., there are no visual or statistical differences) between the five cities; however, there is a tendency to have higher average ratings in Querétaro, Hidalgo, and Mexico City (CM). Figure 5 compares the ratings of each category by academic level.

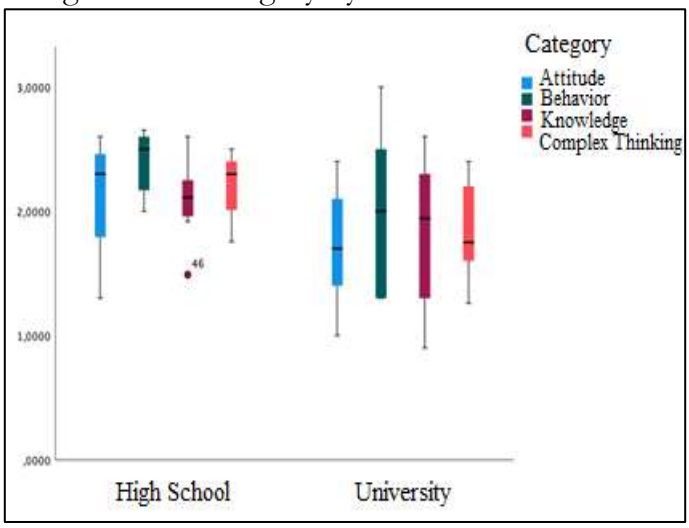

Figure 5. Average grades according to the academic level of the participants.
Figure 5 shows that high school students have better grades. Their average rates are all above 2.0, and the overall average was 2.2. For university students, the general average was 1.8; for all the categories, the average value was less than 2.0. The statistical tests showed that the difference observed for attitude was significant ($p = 0.26$) as well as for behavior ($p = 0.11$) and complex thought ($p = 0.08$); for knowledge, it was not significant ($p = 0.086$).

DISCUSSION

Adequate financial education is a necessary tool for decision-making that allows us to seize opportunities and master and avoid risks when investing, just as the lack of educational training in the financial area is detrimental to the development of competence in people during their formal education. Table 1, together with the characterization information in Table 2, suggests that the population is widely representative of the population group under study; thus, it is important to highlight the low rating averages observed after evaluating the parameters of complex thought and specific knowledge and trends in determining the attitudes and the behaviors of the population against investing. This data matches the data obtained in Mexico in 2015 (CNBV & INEGI) that reported that more than half of the population had no contact with financial institutions, and about 45% did not consider any investment activities with their funds. One-fifth of the population did not save at all. The lack of a culture of savings and investment in the country is caused by a number of economic factors, and financial education and the development of complex thought from the early stages of training are two of the main factors involved.

The transcendence of complex thought is understood in the multiple dynamics of financial reality, since it allows us to identify and weigh different possibilities and risks, putting rational skills into play for successful performance when investing—it is certainly key to financial education. The need for such training is based on the results presented in Table 3, which shows that students respond in a poorly structured way and with a low level of complexity when they are questioned about the types of investment, they are familiar with. While it is true that they mentioned some investing actions, it is important to generate spaces for reflection and financial skill development that promote financial education and facilitate the generation of a culture of savings and investment (Rodríguez Magaña et al., 2020). According to the literature, didactic strategies that promote the development of complex thought should be included to generate better results when assessing the behavior and attitudes of young people within the framework of a culture that supports savings and investment (Décaro-Santiago et al., 2020). Financial education is fundamental to sustainable economic development and decision-making in the youth population.

Financial education is indispensable for managing and allocating money properly; therefore, Figure 2 highlights that students prefer to invest in real estate and generate entrepreneurship. These forms of investment can be classified as basic based on the level of knowledge needed. These low levels of knowledge among the youth population have been previously evaluated, and important similar relationships have been established in the region (Bohorquez, 2020), which can be considered the basis for wrong decision-making when investing (i.e., decision-making based on instincts or on external experiences and not on adequate rational processes that provide optimal results) (Shefrin, 2000). Over the last decade (Atkinson & Messy, 2012), we have emphasized the importance of improving financial education processes from the primary stages of formal education systems, making academic content more flexible to strengthen financial competences together with students' personal development, turning our eyes on the holistic vision of the problem, all of which are typical of complex thought (Patiño et al., 2023). Thus, the idea that financial training is specialized knowledge outside the real

needs of life is discarded; financial training should be integrated into life as indispensable and transdisciplinary learning.

The competence needed for people to develop their financial literacy and to have economic stability is currently acquired empirically, since it is not a specific and structured subject of secondary or higher education programs. The data obtained in Figures 3, 4, and 5 show that students from all cities and from both public and private institutions have low levels of financial knowledge; therefore, their financial attitudes and behaviors do not meet the minimum parameters. They have not achieved complex thought based on how they invest their money. While university students may have a slightly better score than those in high school, they are unable to apply these concepts to their daily lives based on what they report when questioned about their financial attitudes and behaviors. It should be highlighted that among the three dependent variables analyzed, knowledge had the lowest score, which can lead to the notion that the interviewed youth have acceptable behaviors and attitudes despite not having the right concepts or levels of complex thought development. This is because they define this knowledge being based on the experiences of others in decision-making.

CONCLUSION

According to the results obtained here, it is evident that there is a lack of financial education in the consulted population segment, despite financial education being linked to formal education processes. They also lack information about bank financial services, which are displaced by investment options based on empiricism or other well-aimed or well-founded strategies, with no relationship to complex thought.

A priority for the education sector and the productive sector should be the design and formulation of financial education programs that highlight the portfolio of financial services and investment of banks as a source of affirmation of the culture of savings and as a starting point for long-term personal finance projections. Regions like Latin America are faced with the challenge not only of improving financial education processes, but also of generating an economic culture in which financial concepts and complex thought are managed to favor the decision-making of new generations confronting their financial lives.

Conducting qualitative predominance studies with sample convenience presents an important limitation when extrapolating our findings. It is considered pertinent to recommend continuity of research processes on the development of complex thought in terms of investment and personal finance management after implementing training strategies focused on the needs and characteristics of young Mexicans.

Data availability statement

Data available on request.

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