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Artículos científicos

Educación financiera basada en el bitcoin y la inclusión en planes de estudio

Bitcoin-based Financial Education and Inclusion in Curricula

Educação financeira baseada em Bitcoin e inclusão nos currículos

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Resumen

El desarrollo de tecnologías ha impactado en varios sectores de la vida humana. Por supuesto, el educativo no es la excepción. Desde el año 2009 a la fecha, el concepto de *criptomoneda* ha causado furor a nivel mundial, específicamente la *bitcoin*, que utiliza tecnología *blockchain*, un código abierto para operar sin una autoridad central o banco. Esta investigación tuvo por objetivo determinar el rezago que existe en los planes de estudio en las áreas de educación financiera, administrativa, contable y fiscal a nivel superior respecto a este tema. Bajo un método deductivo, se encuestó a una muestra de estudiantes de la Facultad de Contaduría Pública de la Benemérita Universidad Autónoma de Puebla con la finalidad de obtener datos que determinen el interés y las necesidades de los usuarios de *bitcoin.* Los resultados obtenidos demuestran un área de oportunidad contundente para atender este rezago, debido a que existen operaciones realizadas con esta criptomoneda sin la pedagogía básica de su funcionamiento. Como parte de las conclusiones se insta a la reestructuración de los programas de estudio tomando en cuenta la incorporación de

conceptos relacionados con las criptomonedas, y así cumplir con la formación de profesionistas preparados para las exigencias del mercado actual.

Palabras clave: bitcoin, educación financiera, planes de estudio.

Abstract

The development of technologies has impacted various sectors of human life. Of course, education is no exception. Since 2009 to date, the concept of *cryptocurrency* has been all the rage worldwide, specifically bitcoin, which uses blockchain technology, an open source code to operate without a central authority or bank. The purpose of this research was to determine the lag that exists in the curricula in the areas of financial, administrative, accounting and tax education at the higher education level with respect to this topic. Under a deductive method, a sample of students from the School of Public Accounting of the Benemérita Universidad Autónoma de Puebla were surveyed in order to obtain data to determine the interest and needs of bitcoin users. As part of the conclusions, the restructuring of study programs is urged, taking into account the incorporation of concepts related to cryptocurrencies, in order to comply with the training of professionals prepared for the demands of today's market.

Keywords: bitcoin, financial education, curricula.

Resumo

O desenvolvimento de tecnologias tem impactado diversos setores da vida humana. Claro, a educação não é exceção. De 2009 até hoje, o conceito de criptomoeda causou sensação mundial, especificamente o bitcoin, que usa a tecnologia blockchain, um código aberto para operar sem uma autoridade central ou banco. O objetivo desta pesquisa foi determinar a defasagem que existe nos planos de estudos nas áreas de educação financeira, administrativa, contábil e tributária de nível superior em relação ao tema. Sob o método dedutivo, uma amostra de alunos da Faculdade de Contabilidade Pública da Universidade Autônoma Benemérita de Puebla foi pesquisada a fim de obter dados que determinassem o interesse e as necessidades dos usuários de bitcoins. Os resultados obtidos demonstram uma área de esmagadora oportunidade de abordar esta defasagem, devido ao facto de existirem operações

realizadas com esta criptomoeda sem a pedagogia básica do seu funcionamento. Como parte das conclusões, preconiza-se a reestruturação dos programas de estudos tendo em conta a incorporação de conceitos relacionados com criptomoedas, e assim cumprir a formação de profissionais preparados para as exigências do mercado atual.

Palavras-chave: bitcoin, educação financeira, planos de estudo.

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Introduction

The history of money is as old as civilization itself. In the past, following someone's debt was an easy task, and it was done mentally: you owed a piece of meat for a few fruits. Credits and debits were recognized in the memory of each person. Basically a mental ledger. "Coins are a language that allows us to express transactional heat between people, it is a technology older than the wheel, as old as fire" (Antonopoulos, 2020). Through time, barter was established and then currencies as an exchange of goods.

In practically all cultures, coins meet the following five conditions: they must be relatively scarce (scarce), easily identifiable (recognizable), divisible into smaller parts (divisible), that one can be replaced by another of equal value (fungible) and that it can be carried everywhere without too many problems (portable). People use different types of currency as an exchange. And in this era digitized currencies, called cryptocurrencies, have emerged.

Now we carry out more complex financial practices; financial agents practice securitization, always use other people's money, sell debt, use risk transfer or any other type of financial manipulation. This is what they call innovation. And when it comes to financial innovation, the cryptocurrency bitcoin, without a doubt, is one of the cases that is revolutionizing the global economy.

History says that the most revolutionary and disruptive innovation almost always comes from the peripheries, not from what has already been established. True innovators see the world differently, their perspective is bigger, they create new products and entire systems that produce new industries. Steve Jobs mentioned that innovators are capable of finding “the square of the circle” (Pozzi, 2011).

By the end of 2017, the cryptocurrency had an exponential development: it reached over $ 19,000 (Bit2Me Academy, 2017). This obviously sparked interest in the international and national economic environment. Now it has become a means of payment and investment used by new generations to purchase and sell services and products. And it is at this point where the educational field lagged behind, as it did not have the preparation of future professionals in the field of business, which is why it seeks to contemplate these topics based on cryptocurrency within the study plans at a higher level.

Bitcoin It is a virtual currency or cryptocurrency that is used to buy and sell goods or services from person to person regardless of nationality or distance anywhere in the world. A currency with which there are no bank intermediaries. A currency designed based on digital signatures, whose security is backed by a verification network directed by nodes. Despite sharing the main characteristic of cash, which is to carry out transactions, it is a virtual currency, it is intangible. Without a doubt, every day it is having greater acceptance in the different economies of different countries.

On October 31, 2008, Satoshi Nakamoto (pseudonym of the person or group of people who created this cryptocurrency) released a post on the metzdown.com crypto list where he describes the bitcoin protocol. There he mentions that Internet commerce has come to depend almost exclusively on financial institutions, which act as trusted third parties to process electronic payments. The objective of Nakamoto (2008) and the protocol in question was to dispense with this mediator. Bitcoin is presented as a virtual currency used by users in the world and that, unlike existing currencies, uses a peer-to-peer (peer-to-peer) version that allows online payments to be sent directly without having to go through a financial institution. Through digital signatures and through a mining system based on the solution of mathematical algorithms, the problem of double spending is solved. Here the CPUs appear as the main part in the processing of the generation and control of nodes. Bitcoin, therefore, does not have the backing of any world or national bank or has an issuer, as is the case with any traditional currency. In this way, the exchange depends on the value that you buy and that you sell give to that value.

To carry out operations with bitcoin it is necessary to technically generate this currency and solve the mathematical problems described in Satoshi's document. An easier way is to buy this currency through legal coins. That is, there are websites that are dedicated

to trading the currency at a price that, for obvious reasons, is constantly changing (LocalBitcoins.com, 2018).

Currently there are countless applications and software for the control and operation of bitcoin. In all of them we find the same objective: an accounting control of the balance in our virtual account, which is affected by transactions duly signed and authorized by the same network.

Problem Statement

With the rapid evolution of ICT, future professionals in the business area face a globalized challenge: the crypto economy. The way to operate and use cryptocurrencies has become an empirical learning within their education, based on trial and error.

The main characteristic that a graduate must offer his clients is a quality service, and to achieve this concept an adequate preparation and study of the "new financial terms" is necessary. Cryptocurrencies and related, despite having appeared at least since 2009, are concepts that are not addressed in the study topics in different careers related to business and, consequently, in the educational field.

The work of modifying study plans in universities is a complex activity that involves the design of materials, content and advanced programming platforms to offer users a friendly and accessible environment from applications within their smartphones.

Discussing concepts such as bitcoin, which in other countries already operate normally, and not knowing the reasons or repercussions of the use of this virtual currency, has led us to question the level of technological innovation that Mexico has been able to adopt, not only in the area of health or systems, also in the educational environment.

To what extent are Mexican companies and local businesses informed about bitcoin? Is the use and acceptance of this currency as a means of payment legal? Who regulates and how is the emission distributed? How is the current value of bitcoin exceeding the price of the euro? Do the universities of Mexico contemplate the topic of cryptocurrencies within their study plans? Are future professionals prepared for handling cryptocurrencies in the financial environment? Is it necessary to implement themes and platforms in the study programs of the universities of Mexico to determine what are the reasons for using bitcoin as a currency and technological tool in the transactions of Mexican financial entities?

It is important to know the answers to each of these basic questions. At the moment of recognizing the lag in these issues, the areas of opportunity that must be covered immediately should be identified in order to be at the same level and in equity with the professionals of other countries and thus train individuals capable of dealing with the challenges of the present and the future.

Objectives

General objective

- Know, analyze and evaluate the handling of the cryptocurrency bitcoin in the educational and financial environment to determine the advantages and disadvantages of using this concept as a means of payment in the transactions of Mexican companies, and thus establish a proposal of topics to join the study programs of the Faculty of Public Accounting of the Meritorious Autonomous University of Puebla.

Specific objectives

- Know and analyze the basic concepts of the bitcoin cryptocurrency to determine the advantages and disadvantages of its operation.
- Evaluate the important factors, according to expert users on the subject, to establish the areas of opportunity in the educational field.
- Establish a proposal of study topics that revolve around the cryptocurrency bitcoin to be included in the study programs at the Faculty of Public Accounting of the Benemérita Universidad Autónoma de Puebla.

Hypothesis

- The incorporation of cryptocurrency-based topics into the study plans will strengthen the professional development of the students of the Faculty of Public Accounting of the Benemérita Universidad Autónoma de Puebla.

Developing

Andreas Adriano and Hunter Monroe (2016) They mention that the best thing about cash is the simplicity of operations. You give money and you get something. No one asks for name, address, phone number, date of birth, social security number, salary, and length of current job ... Cash builds instant trust between buyer and seller (Adriano & Monroe, 2016). That trust has been replicated, in its own way, by bitcoin.

Palacios, Vela and Tarazona (2015) conclude that bitcoin is considered an experimental currency and that it lacks recognition within the global economy, however, it is used as an alternative to expensive traditional systems. It is therefore a paradox. Although it lacks recognition, it is used in real time as a means of shipping, payment and investment in different countries.

In England, Germany and China, banks are using blockchains as registries with the idea of simplifying transactions and information storage, taking into account the characteristics of higher speed, lower costs, high security and elimination of errors. Don Tapscott and Alex Tapscott (2017) mention that bitcoin or any other digital currency is not stored in files that are in a specific place; It is represented by transactions that are recorded on a blockchain, which is a kind of spreadsheet or record that uses the resources of a wide peer-to-peer network to verify and approve each and every transaction.

Ramos (2014) points out that bitcoin is the subject of strong criticism because it grants anonymity to each user, that is, regulatory entities and central banks find it difficult to track transactions between users and impossible to decipher their real identities and location. physical, so it is defined as a potential instrument to commit criminal and illegal acts, for example, money laundering or fraud.

Being an innovative topic, in Mexico there are few sources of consultation, however, there is already a legal law that is trying to regulate operations based on this cryptocurrency, published on March 9, 2018 and called the Law to Regulate the Financial Technology Institutions (Presidency of the Republic, 2018).

From the publication of this law, a new stage emerged for the use and regularization of the institutions that handle cryptocurrencies. According to El Financiero de México (2018), this law aims to regulate the financial services provided by financial technology institutions, as well as their organization, operation and functioning, particularly those of the

private sector. Of the 145 articles divided into seven titles that make up the Law to Regulate ..., this media wrote the following points as a summary:

- It arises from an initiative sent on October 10, 2017, which was approved in the Upper House on December 5 of that same year.
- Financial technology institutions are understood as those platforms through which the execution of financial operations and services related to access to financing and investment, issuance services, administration, redemption and transmission of electronic payment funds is facilitated, in addition of the use of virtual assets in such operations.
- These institutions, in the private sector, are electronic payments, collective financing, virtual assets and electronic financial advisory, among others.
- The new law, among other aspects, proposes to consider the use of virtual assets, such as cryptocurrencies, with prior authorization from the Bank of Mexico (Banxico).
- It seeks to prevent and mitigate the risk of money laundering and terrorist financing, establishing an internationally accepted and approved regulatory framework, with minimum standards for customer identification, which allows preventing this type of conduct.
- The law in question provides a risk disclosure regime by virtue of which financial technology institutions are obliged to disclose the information necessary for their clients to identify the risks they will assume when entering into transactions with or through them.
- It aims to establish the corporate governance of financial technology institutions by having a board of directors, general director and audit committee based on the number of operations or clients, business models, intermediated assets or level of net capital held by said institutions.
- It also considers a regulatory framework in which administrative and criminal sanctions are contemplated for cases in which the provisions of the law or provisions emanating from it are not complied with. (El Financiero, 2018).

Now, the portal elbitcoin.org predicts that the total number of bitcoins will tend to 21 million over time. Your supply grows in a geometric series (with a constant ratio). As the

number of bitcoins approaches the 21 million limit, the economy of this type is expected to go into deflation.

Bitcoins, meanwhile, are divisible to eight decimal places (giving us 2.1 x 10 raised to the fifteenth power —2.1 trillion — of total units), and potentially even more, which removes practical limitations on price adjustments at a time. deflationary context (elbitcoin.org, 2013).

The same site mentions some of the advantages of using the cryptocurrency bitcoin:

- Greater privacy, by eliminating third-party interference in transactions.
- Decreasing and predictable increase in the money supply, which helps to preserve (and probably improve) the purchasing power of users.
- Lower (and even zero) transaction costs on the Web, whose current levels (for example, through PayPal) hinder free exchange.
- Simplify and accelerate person-to-person payment, dispensing with unwanted intermediaries.
- A bitcoin address can be anonymous, if the user so wishes.
- Allows transfers to anywhere, ignoring geographical and political barriers.
- It is transparent: although no one is forced to reveal their identity, all transactions are recorded in a freely accessible register.
- Supports complex transactions (escrow; deposit insurance; guarantees; mediation, etc.) with strong cryptographic support for all kinds of rules and conditions freely agreed by the parties.
- Never Stops: There are no holidays or weekends for bitcoin trading.
- Makes large-scale micropayments feasible.
- Prevents the freezing and confiscation of funds.
- Prevents the involuntary reversal of payments.
- Prevents the arbitrary restriction of goods and services that can be purchased.
- Allows the accumulation of huge fortunes in a tiny space.
- It can be hidden easily and free of charge, without having to appeal to third parties for its protection and transfer.
- Can be saved simultaneously in multiple locations.

- It does not require trust in a third party or in a specific legal system to preserve its value.
- Provides protection against theft in all its forms: the technology on which the bitcoin protocol is based is several times more secure than that used by banks and credit cards.
- It cannot be removed by legal / computer attacks, given its decentralized nature.
- It cannot be falsified.
- It is easy and instantly recognizable.
- It is, for practical purposes, infinitely divisible.

The number of people who break the medium of carrying out virtual operations is increasing and enjoy free commercialization in electronic commerce, enjoying speed and security in their collections and payments.

More and more businesses and commercial electronic sites open the doors to bitcoin. There have even been some cases of people and even groups of people who survive in the current economy only with the use of this currency (Jiménez, 2020).

In Mexico, some small entrepreneurs are already clear about where the future of payments is going by accepting cryptocurrencies in their stores (Huffpost México, 2017). Companies like Mobla (a furniture manufacturer) bet on the handling of bitcoin, however, they have only received one payment in this cryptocurrency, and they mention that the market in Mexico is not prepared and more information is needed from consumers (Huffpost Mexico, 2017).

David Noriega, owner of the Fantástico Cómics store, believes that bitcoin is going to revolutionize the way of making payments in a similar way to how the Internet had its impact on society. His confidence in cryptocurrency led him to install a bitcoin ATM in 2014. However, he points out that people still do not use bitcoins for their purchases, since it is mainly used as a form of savings or speculative investment (Huffpost Mexico, 2017).

Of course, Mexico is capable of handling a currency like bitcoin, especially considering that the acceptance of this country in the global market in recent years has increased thanks to the electronic market. Sites like Mercadolibre and Amazon de México have been windows to carry out multiple transactions with different countries and regions of the world. Buyer's confidence is reflected in the number of daily transactions carried out,

mainly by a majority sector belonging to the middle and upper-middle social classes. Today, with a computer and internet connection, it is possible to buy a tablet in China and receive the product in a matter of days.

In the field of education, the handling of bitcoin has become one of the main topics, especially in administrative and financial careers. The cryptocurrency issue was reinforced once countries such as Mexico regulated the use, otherwise Russia and some countries in Asia, where making transactions with bitcoin is prohibited.

In Spain, the University of Alicante has been teaching the open and massive online course (MOOC) "Bitcoin, the virtual currency" since 2015, which answers the most common questions on the subject (Fernández, 2017). And through Coursera, the course "Bitcoin and cryptocurrency technology" is taught, supported by Princeton, and whose success produced that it was adapted to an academic record book. Similarly, New York University and Stanford University focus their programs on the study of cryptocurrencies (Fernández, 2017).

While, in the informal facet of education, groups in virtual communities (Facebook, Meetup, blogs and wikis) that offer information on the matter stand out. However, precisely because of their informal nature, they do not usually have a structured agenda and many of the times the members focus more on attracting new cryptocurrency users and directing them to certain sites to earn a commission.

In addition to these virtual spaces, we can find a number of applications related to bitcoin: from electronic wallets to tools for real-time monitoring of the prices of different cryptocurrencies.

Endless conferences and research papers are placed on the Internet for consultation and especially to understand the operation and language of cryptocurrencies. Taking into account what has been mentioned so far, it is essential, and to do so urgently, a study program that focuses exclusively on definitions and concepts of the use of cryptocurrencies, as well as on the regulation of these as a means of payment and investment.

Methodology, techniques and materials used

The research was carried out under a deductive method. From the general to the particular, they analyzed the concepts of the themes.

It is an exploratory research because a qualitative approach was adopted, with an emphasis on the analysis of secondary sources (books, newspapers, magazines, and electronic pages).

The study methods were carried out by means of a survey-type instrument.

For the study, a sample of 500 students was considered from a group of 3,500 students from the Faculty of Public Accounting of the Benemérita Universidad Autónoma de Puebla; Students who showed interest in the topic of cryptocurrencies and in the particular case of bitcoin during the spring 2019 period.

For the construction of the instrument, the use and operation of cryptocurrencies was considered, as a means of payment and a means of investment, in order to collect the necessary data to develop an updated study plan specialized in financial education.

As it is a specialized topic, the results of people who are not related to the topic were omitted, and thus only the data of users with experience in the area were analyzed. After applying the instrument, the results obtained were discussed.

Participants

In the Faculty of Public Accounting of the Meritorious Autonomous University of Puebla, three degrees are offered: a degree in Public Accounting, a degree in Financial Management and a degree in Administration and Management of Small and Medium Enterprises. From the three degrees, students from the sixth semester onwards were selected. The questionnaire was applied in person and remotely. It is worth mentioning that the first question in the questionnaire refers to knowledge of cryptocurrencies: those who answered negatively to this question were immediately discarded.

In addition, 20 questionnaires were randomly applied to faculty teachers in order to compare the knowledge of cryptocurrencies and the context of operation and functioning of bitcoin.

Instruments

The data collection instrument corresponds to a questionnaire with 20 closed questions. This questionnaire was standardized in such a way that it was applied exclusively to students from the sixth semester onwards with experience in handling cryptocurrencies.

As a pilot test, questions and interviews with experts on the subject began, the result of an open forum between students and teachers, where the main argument was the acceptance of the Fintech Law, as well as the regulation of cryptocurrencies in Mexico. Subsequently, the questionnaire for application to the sample was refined.

Procedures

The theoretical framework was analyzed to know the origin and operation of the cryptocurrency bitcoin as a means of payment and as an investment instrument in Mexico. To obtain a conclusion and design an optimal proposal, surveys and interviews were used. Here are some details of each of the stages and instruments:

- Document analysis: different electronic information sources were consulted to establish concepts and definitions prior to interviews and surveys.
- Interviews and criteria of specialists: interviews were conducted with teachers of the accounting and finance area with experience in handling cryptocurrencies with the aim of gathering different perspectives and knowing their positions about bitcoin and the feasibility of including them in the study plans of Bachelor's degree topics related to cryptocurrencies.
- Surveys: aimed at a sample of 500 undergraduate students, who have had some approach to cryptocurrency issues and especially bitcoin, with the aim of knowing the academic interest on the subject and their level of knowledge about it.

Based on the three instruments, it is intended to conclude with the advantages and disadvantages of using the cryptocurrency bitcoin, as well as the implementation of these topics in the study plans of the degrees offered at the Faculty of Public Accounting of the Benemérita Universidad Autónoma de Puebla.

- Data analysis strategy: the data obtained were analyzed, coding the answers to the closed questions with a value of one for an affirmative answer and with a value of zero for a negative answer.

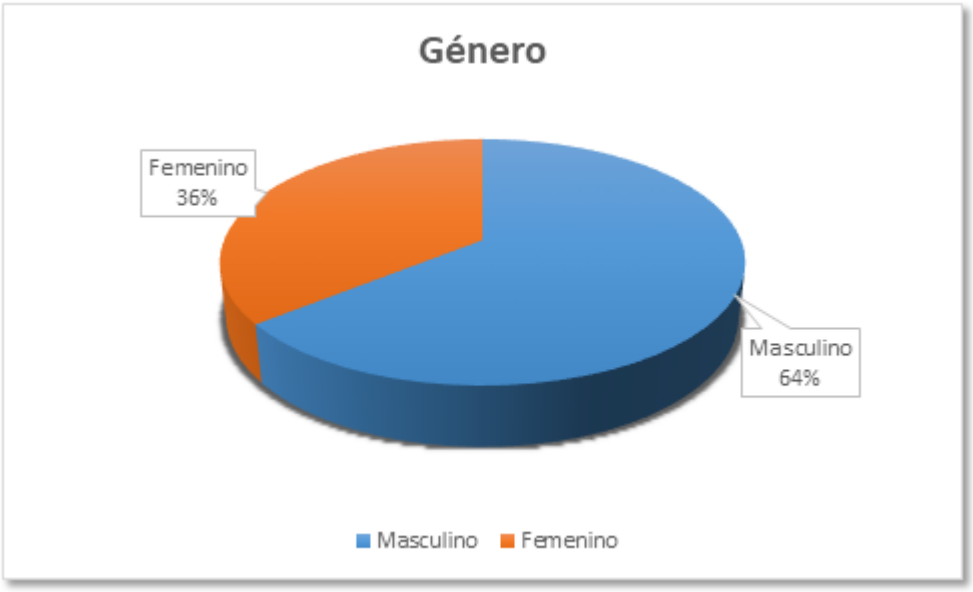
Also from the following scale: 5 = Totally agree, 4 = Agree, 3 = Impartial, 2 = Not strongly agree and 0 = Totally disagree.

Pie charts are made to show the results in percentages. Finally, it should be clarified that the extremes of the sample with maximum and minimum values were eliminated to reduce the degree of error and bias.

Results

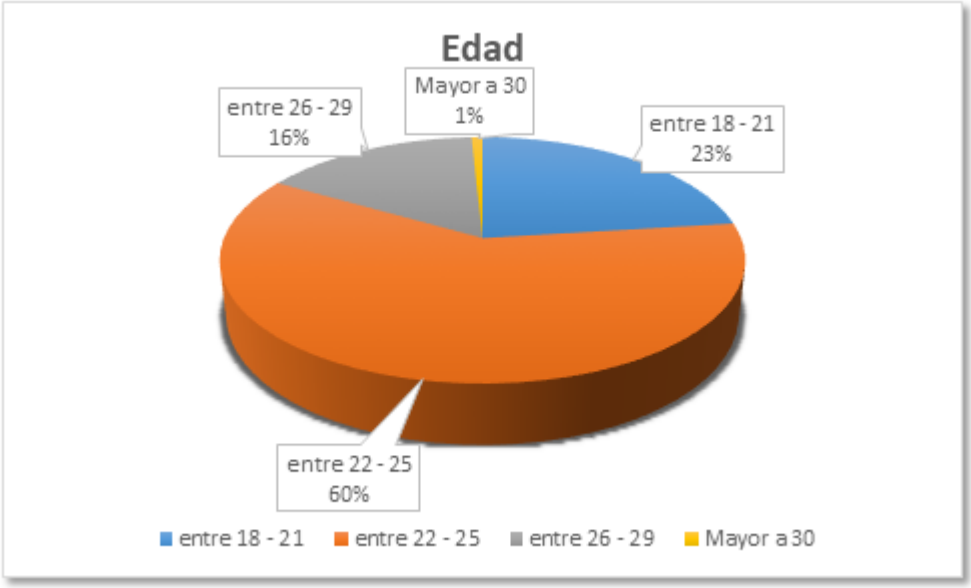
Next, the surveys carried out on the previously selected sample of students are analyzed, corresponding to undergraduate students from the sixth semester onwards from the Faculty of Public Accounting of the Benemérita Universidad Autónoma de Puebla, which was applied directly and by mail to the interested.

Figura 1. Género de los encuestados



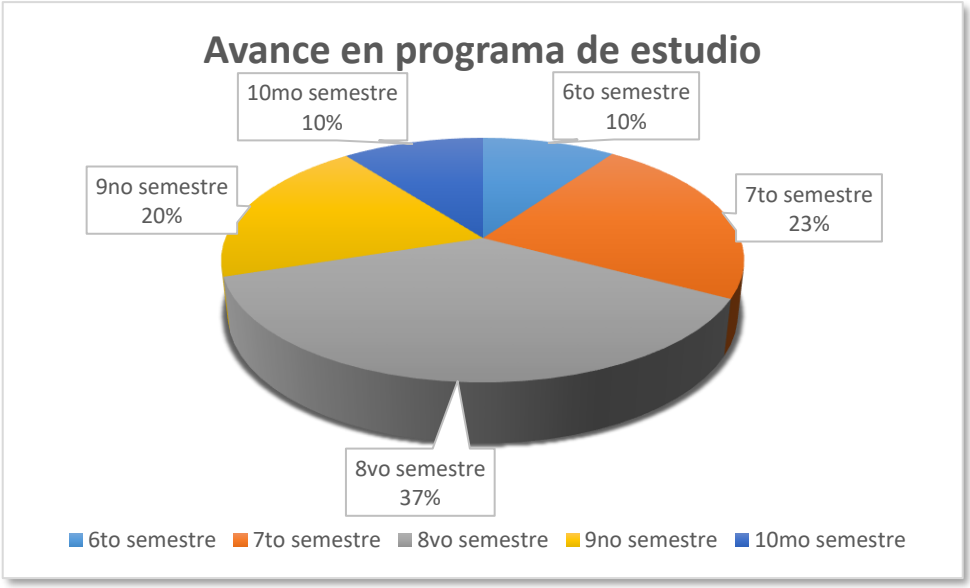
Fuente: Elaboración propia

Figura 2. Edad de los encuestados



Fuente: Elaboración propia

Figura 3. Avance en programa de estudio



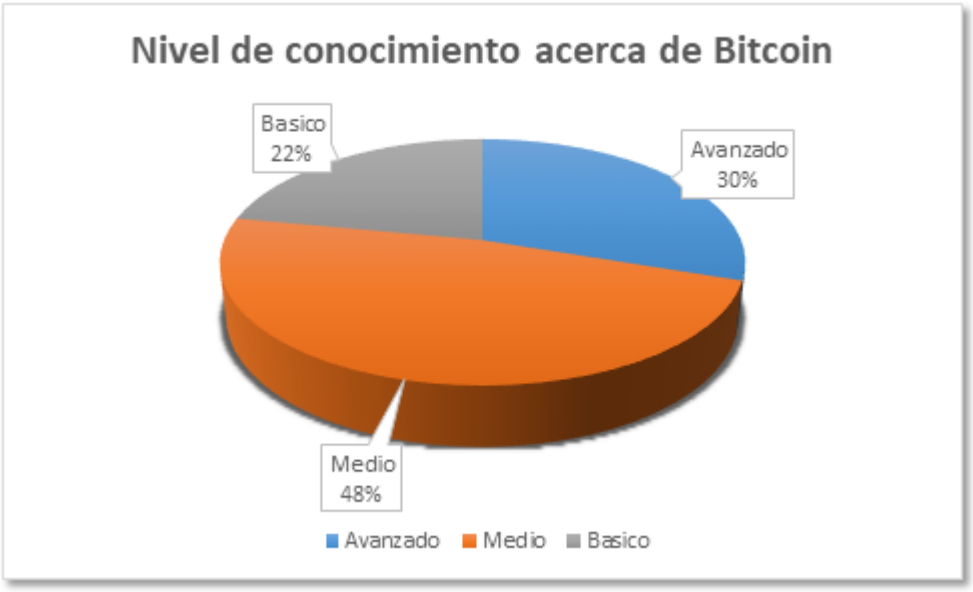
Fuente: Elaboración propia

In principle, it is observed that, of the total of people surveyed, 64% are men and 36% women (figure 1). In general, within the faculty, there is practically a gender balance. Figure 2 shows that 23% are between 19 and 22 years old, 60% are between 22 and 25 years old, 16% are between 26 and 29 years old, and 1% are over 30 years old. A simple

observation that can be made from the above is that this new cryptocurrency called bitcoin is of greater interest among young people, known as millennials, with a greater participation among those over 18 and under 29 years old, and this is moderately reasonable , since the cryptocurrency was created in 2009 and, therefore, is very new for society, difficult to reach for older generations (figure 2). It is also observed that 37% of the sample is in its eighth semester, 23% is in the seventh and 20% in the ninth, which gives us a broad parameter of the knowledge and acceptance of new technologies in the training of professionals within the degrees that offer the Faculty of Public Accounting of the BUAP (figure 3).

What level of knowledge do you think you have about the cryptocurrency bitcoin?

Figura 4. Nivel de conocimiento acerca de *bitcoin*

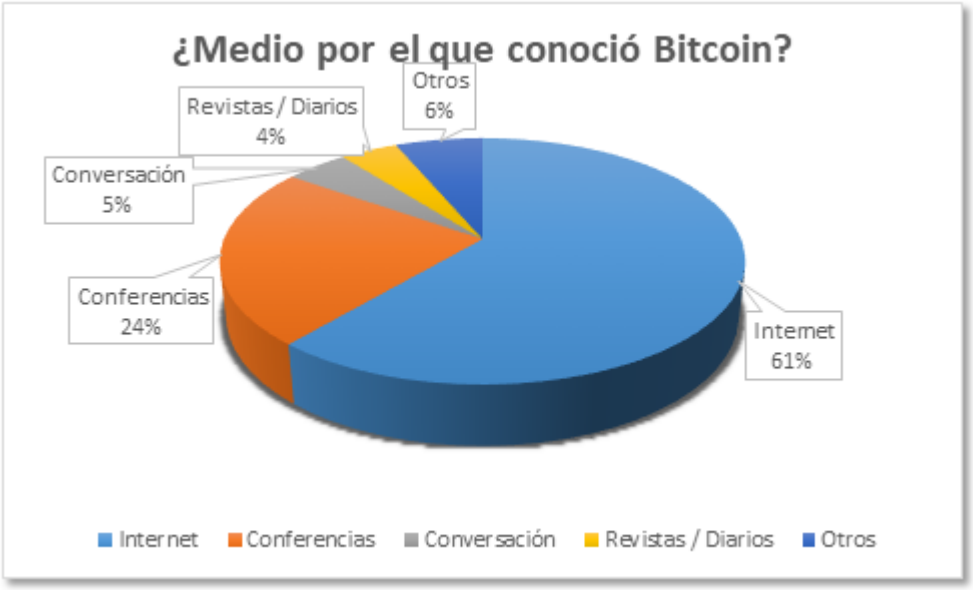


Fuente: Elaboración propia

Of the total of the people surveyed, 30% consider that they have advanced knowledge of bitcoin (they trade), 48% responded that they feel average knowledge (they buy products or services with bitcoin), while 22% mentioned having basic knowledge of operation (knows the bitcoin protocol, and has amounts in electronic wallets). This shows that the majority of people surveyed have had a considerable approach to cryptocurrency terminology, since the basic level is limited to general knowledge of how cryptocurrencies work (figure 4).

What was the means by which you learned about bitcoin?

Figura 5. Medio por el que conoció el *bitcoin*

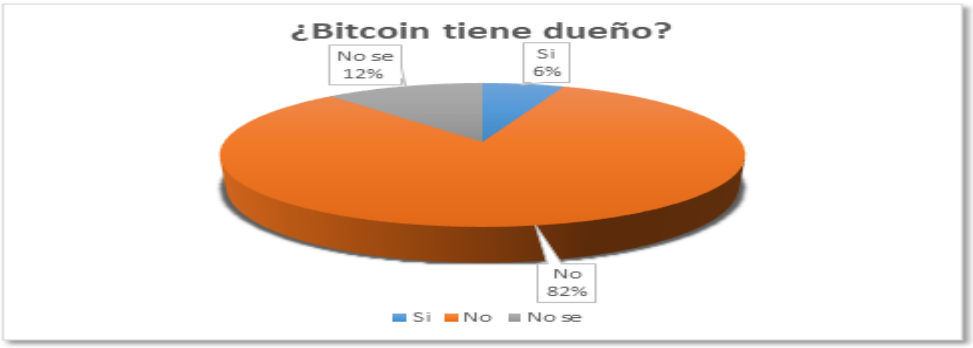


Fuente: Elaboración propia

Most of the participants who already knew about this technology, 61%, did so through the Internet; 24% learned about the subject through conferences and the rest is made up of informal conversation, 5%, magazines and newspapers, 4%, and other sources, 6% (figure 5). Thus, the main source is Internet browsing.

Do you know if bitcoin has an owner?

Figura 6. ¿*Bitcoin* tiene dueño?

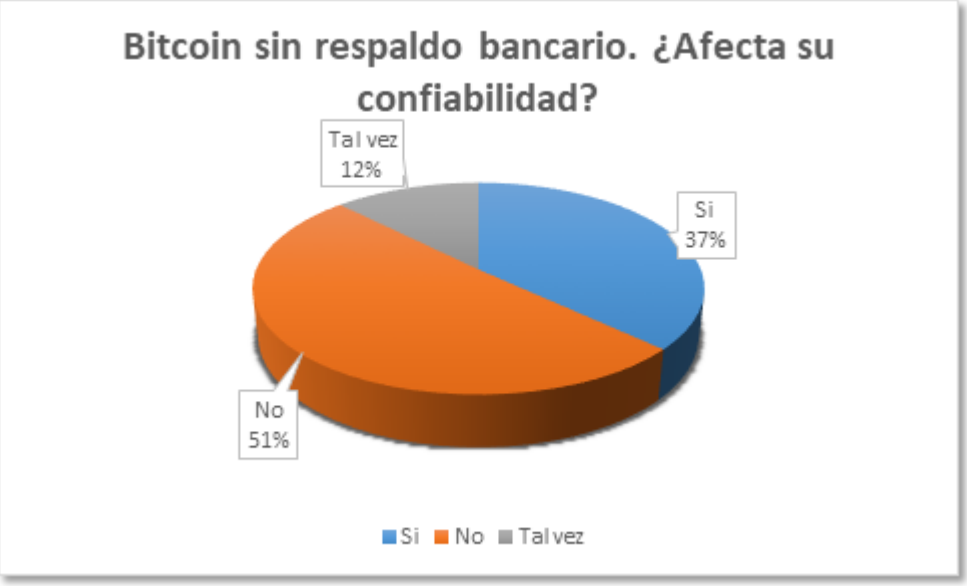


Fuente: Elaboración propia

This question was interesting, since the main characteristic of this currency is that it does not have an owner, and it is correctly reflected in the answers: 82% answered that it does not have an owner, 12% answered not knowing and 6% said that bitcoin it does have an owner (figure 6).

Bitcoin is not backed by any bank. Does this affect your reliability as a user?

Figura 7. Bitcoin sin respaldo bancario, ¿afecta su confiabilidad?

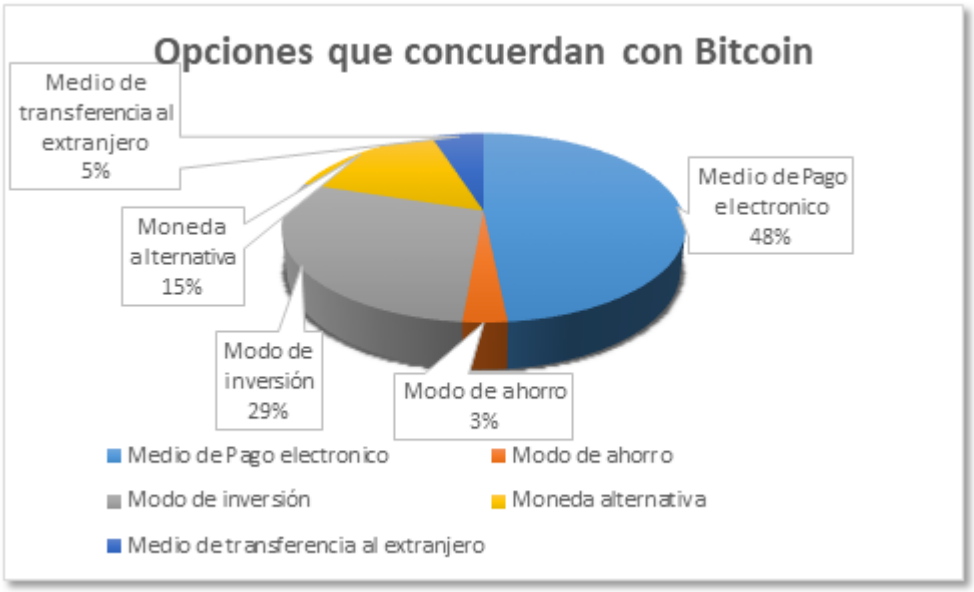


Fuente: Elaboración propia

The independence of bitcoin affects the reliability of users by 37%. On the other hand, 51% responded that, despite not having bank support, they trust the cryptocurrency, while 12% responded that this factor may or may not affect their degree of trust regarding this currency (figure 7). Undoubtedly, one of the strongest paradigms when operating with cryptocurrencies is the uncertainty of knowing who is responsible for managing resources.

From your point of view, what is the main option that agrees with bitcoin?

Figura 8. Opción que concuerdan con *bitcoin*

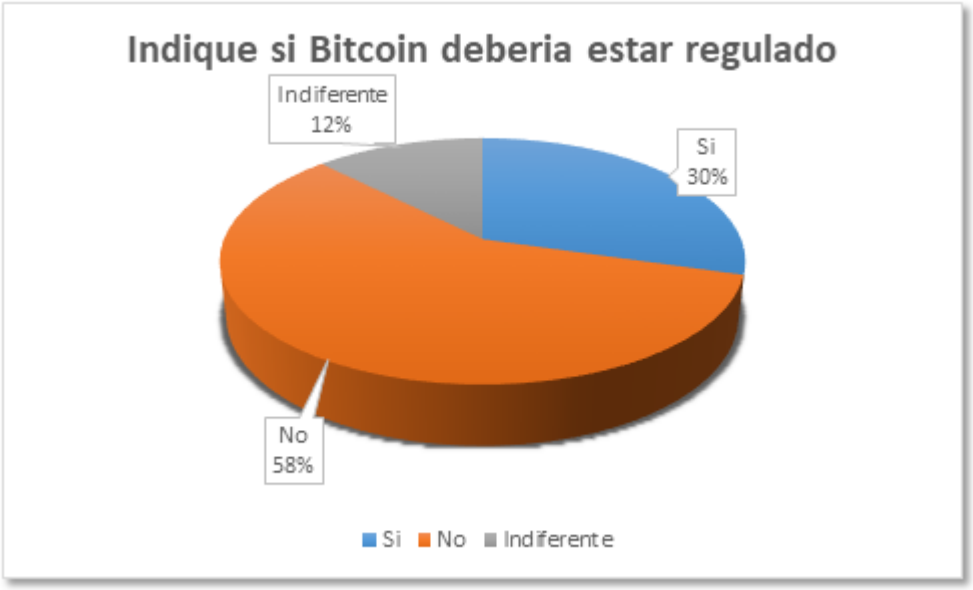


Fuente: Elaboración propia

This question was posed to find out the main reasons why they use cryptocurrency. It was found that 48% of people use it as a means of electronic payment, 29% see it as an investment, 15% answered that it is an alternative currency, 5% identify it as transfers abroad and 3% take it as a savings (figure 8).

Do you consider that bitcoin cryptocurrency should be regulated?

Figura 9. Indique si bitcoin debería estar regulado

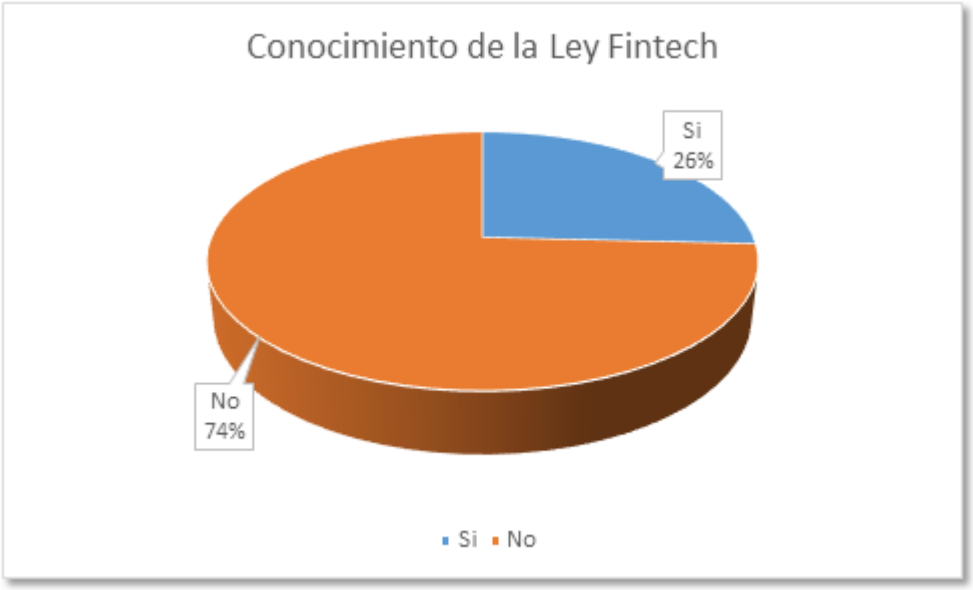


Fuente: Elaboración propia

30% of those surveyed said yes, while 58% answered that cryptocurrency should not be regulated (12% were indifferent to regulation). In Mexico there is already regulation for entities that operate with cryptocurrencies, however, not for end users (Fintech Law). Let us remember that the main characteristic of the currency is that it is governed by the supply and demand of the users themselves, and, as it is regulated, it may or may not affect its use (figure 9).

Do you know or have you heard about the Fintech Law?

Figura 10. Conocimiento de la Ley Fintech

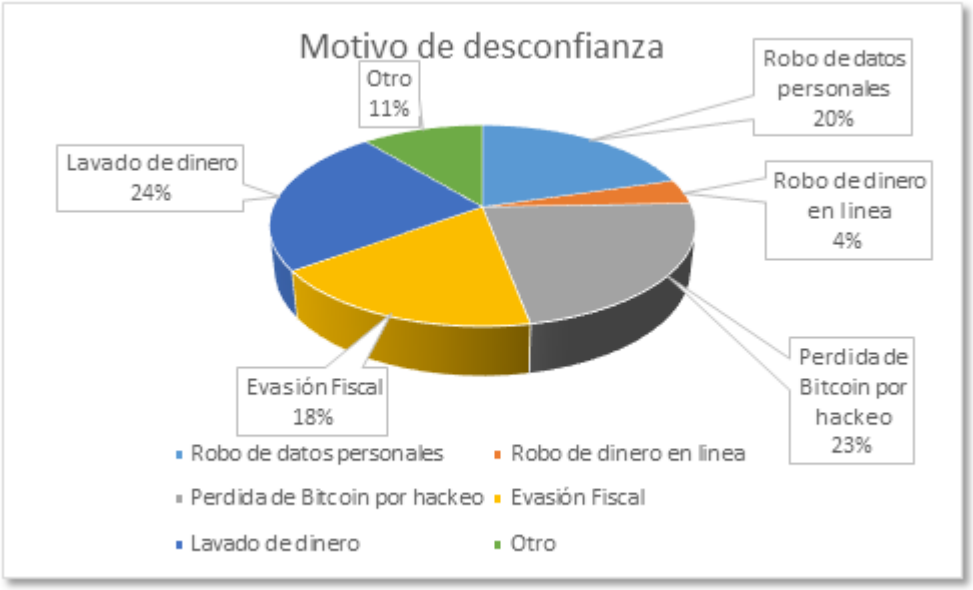


Fuente: Elaboración propia

When questioning users about their knowledge of the Fintech Law, 26% answered affirmatively, while 74% answered that they did not know said law. The ordering referred to was published on March 9, 2018 as a measure of control and regulation of cryptocurrencies, however, it has not been disseminated and due to its early publication it will still be subject to change during this year (figure 10).

What is the main reason for mistrust when using bitcoin?

Figura 11. Motivo de desconfianza al utilizar *bitcoin*



Fuente: Elaboración propia

It was also surveyed on the main factors of mistrust when using cryptocurrencies and it was found that 24% are suspicious because it is related to money laundering, 23% fear losing their bitcoin through hacking, 20% link it to data theft personal transactions, 18% assimilate it with tax evasion activities and 4% think they can lose their money online (figure 11).

Do you know physical or online establishments that operate with Bitcoin?

Figura 12. Conocimiento de establecimientos que operan con *bitcoin*

Fuente: Elaboración propia

However, 84% of people surveyed claim to know establishments that operate with bitcoin, on the contrary, 16% responded not knowing about these sites. It should be noted that many of the establishments are online. They are mostly electronic game stores or smartphone applications (figure 12).

Have you carried out any transaction with bitcoin?

Figura 13. Alguna operación con *bitcoin*

Fuente: Elaboración propia

In this case, it can be seen that 70% of the respondents answered affirmatively, that is, that they have made at least one purchase or sale, investment or savings with the bitcoin cryptocurrency; while 30% have not carried out operations, although they know how it works. Let us remember that the selected sample is at a university level, where digital media is exploding (figure 13).

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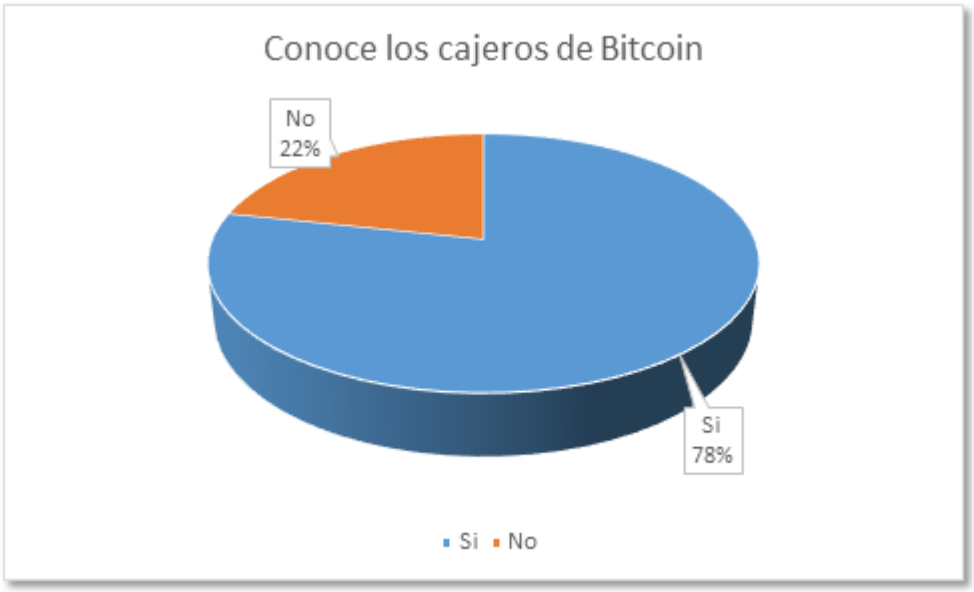
Do you physically know a bitcoin ATM or have you heard of its existence?

Figura 14. Conoce los cajeros de *bitcoin*



Fuente: Elaboración propia

Figure 14 shows that 70% of users have heard or know about bitcoin ATMs, while 22% of those surveyed do not know them. ATMs have existed in Mexico since 2014 in Tijuana, Monterrey, Guadalajara, CDMX and Puebla.

What has been your main source for bitcoin-related knowledge?

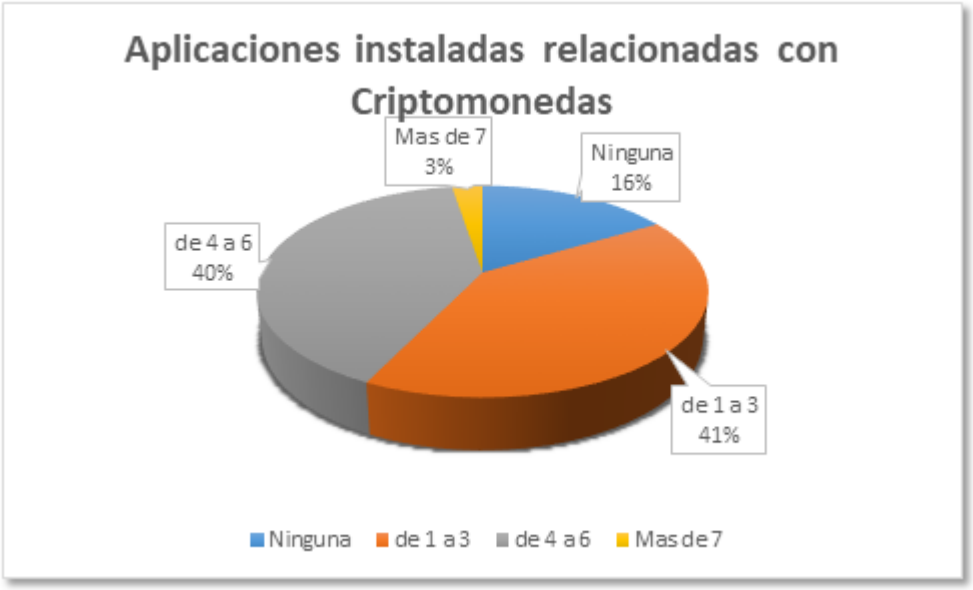
Figura 15. Fuente de conocimientos adquiridos referentes al *bitcoin*

Fuente: Elaboración propia

Here 30% of the respondents answered having knowledge about bitcoin thanks to trading, which consists of buying and selling cryptocurrency; 24% answered that the knowledge acquired was obtained from web pages; 17% learned about bitcoin with online payments; 16% attended forums; 8% in blogs, and 5% answered that by other sources. From the rise registered in December 2017, people looked for the opportunity to earn money, so they bought and sold this cryptocurrency, which led them to the world of trading (figure 15).

Number of applications installed on your smartphone related to cryptocurrencies

Figura 16. Aplicaciones instaladas relacionadas con criptomonedas



Fuente: Elaboración propia

16% of those surveyed said they did not have cryptocurrency-related apps on their smartphones, while 84% had at least one app. The application with the most downloads corresponds to electronic wallets (e-wallet), an instrument used to send and receive cryptocurrencies, followed by applications to consult real-time bitcoin prices (figure 16).

Do you know a course or diploma related to cryptocurrencies?

Figura 17. Conocimiento de cursos o diplomados referente a criptomonedas

Fuente: Elaboración propia

As part of the objective of this research, this question was formulated in the sense of knowing the area of opportunity created from this cryptocurrency. Thus, 11% answered knowing a course or diploma, while 89% answered negatively. Generally, the courses and diplomas offered regarding cryptocurrencies on the Internet are conditioned to a registration of users, who fall captive in theft or fraud by companies that handle a pyramid model, which require the entry of other users to withdraw their investment (figure 17).

Do you think it is necessary to include topics related to cryptocurrencies in the study plan of the degrees of the Faculty of Public Accounting of the Benemérita Universidad Autónoma de Puebla?

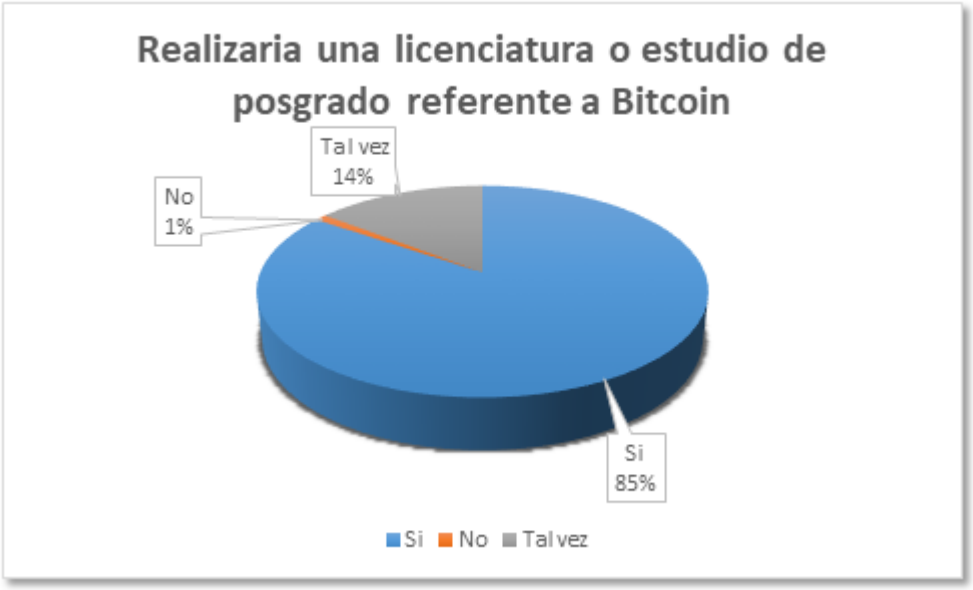
Figura 18. Importancia de incluir temas referentes a criptomonedas en plan de estudio

Fuente: Elaboración propia

If we analyze this graph we can see that 96% of those surveyed find it extremely important to include topics related to cryptocurrencies in their study plans. As it is a valid and accepted means of payment, educational institutions, managers and teachers must be involved in modifying study programs for future generations (figure 18).

Would you do an undergraduate or graduate study on bitcoin?

Figura 19. Realizar estudios a nivel licenciatura o posgrado referente a *bitcoin*

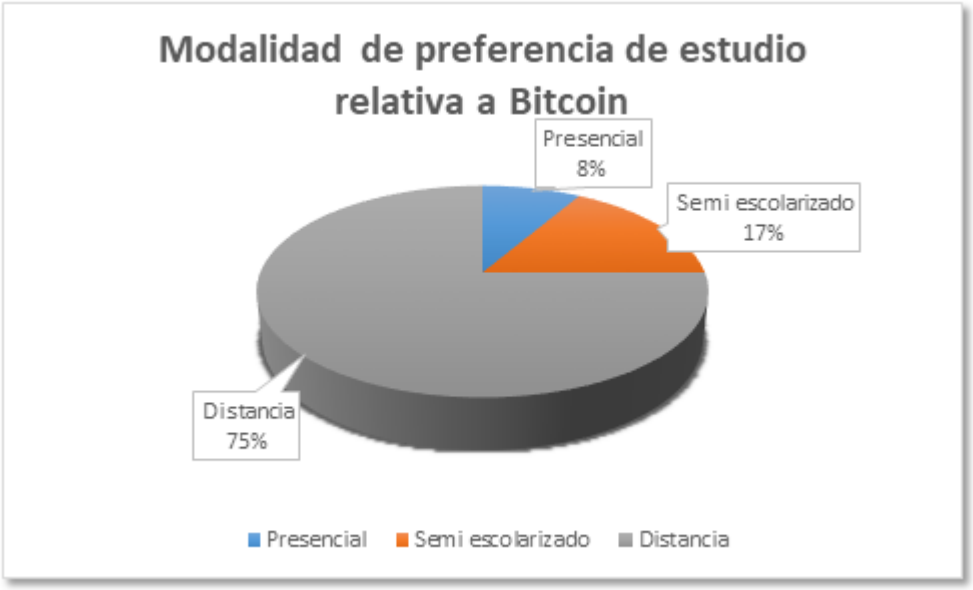


Fuente: Elaboración propia

In this case, 85% of those surveyed responded affirmatively to their interest in studying a bachelor's degree or postgraduate studies related to cryptocurrencies, 14% answered that perhaps and only 1% stated that they did not carry out studies in this area. If we analyze in a general way, we have that 99% of the respondents are interested in this topic, which brings us to a focus of attention for national education, since since they do not have undergraduate and postgraduate studies in this area in Mexico they will look for the alternative in the foreigner (figure 19).

What modality do you prefer to carry out a professional bitcoin study?

Figura 20. Modalidad de preferencia de estudio relativa al *bitcoin*



Fuente: Elaboración propia

In figure 20 it is observed that 8% favor a preference to study in a traditional way, that is to say, face-to-face, 17% opt for a semi-schooled modality, with a mentor or tutor to guide them in this area of knowledge in cryptocurrencies, and 75% answered that the best form of study is at a distance. The accelerated pace in the preparation of professionals leads us to adapt the new programs to a distance modality, due to the developed skills of this generation that is undoubtedly characterized by being self-taught. Adding to this argument, the best way to understand cryptocurrency is to operate with it in a practical way (figure 20).

Discussion

This research concludes that it is necessary to modify the study programs at the undergraduate level of the Faculty of Public Accounting of the Benemérita Universidad Autónoma de Puebla, due to the changes and demands of the economic market, and thereby contribute to companies and Cryptocurrency users enjoy security and not uncertainty in operations.

It was observed that until today there is no educational institution in Mexico that offers a career related to cryptocurrencies, much less a postgraduate study. Thus, it is an area of

opportunity for universities and, from there, to face the demands of new technologies in education and financial trade. Although it is true that cryptocurrencies are already operated in Mexico, there are still missing accounting and technical record criteria for their identification and inspection.

Without a doubt, it must be taken into consideration that the main source of knowledge that users have so far is consulting web pages, or directly entering into trading (buying and selling bitcoins), so it is necessary to have courses, graduates and careers directed in this area.

The inclination of generations to new information and communication technologies is also notorious, since they are the main engines of this cryptocurrency, as it is used regularly for operations between other people (person to person) through applications installed on their phones. smart.

It is concluded, in the same way, that when developing a study program related to cryptocurrency, a new opportunity would be offered to the new generations to train in a professional way with greater opportunities for the exercise of their careers.

Regarding the proposed objectives, it is concluded that, with this research, the handling of the cryptocurrency bitcoin was known, evaluated and analyzed, and the advantages and disadvantages of using it as a means of payment were determined. Based on all of the above, it was possible to design a thematic proposal that will serve as a basis for national universities in their future study plans.

Conclusions

Already accustomed to technological changes in very short periods, bitcoin quickly became popular with users to be used as a means of electronic payment. This is due to the fact that it offers greater security than that offered by electronic transfers; reduces fraud, password theft and credit card cloning, which accounted for a high amount in family and business losses.

One more reason to use bitcoin is to allow the pages a trust system, regulated with the already approved Fintech Law. This ensures that the person who sells receives the payment, as long as the merchandise reaches its destination, as handled by some well-known auction and second-hand pages.

Sending money to other parts of the world is accompanied by a commission or charge for the sending service; When handling bitcoin, intermediaries are eliminated and the virtual money arrives intact and complete (which is why companies that are dedicated to sending money or currencies to different regions and even countries will be affected, as is the case of sending dollars to Mexico by Mexican workers in the United States).

There is already a wide acceptance of bitcoin in many countries. In Mexico, the first indices in the use of bitcoin as a payment currency are beginning to emerge. And we have the proof in the openings of exchange houses and bitcoin ATMs. Surely, in a not too distant time, sending and receiving bitcoins will be very similar to what we now do when sending and receiving emails: in a simple and secure way.

Now, having people already operating in Mexico with bitcoins, portals that offer articles and services and accept bitcoin as a means of payment, exchange houses and bitcoin ATMs, we can say that there are enough reasons to use bitcoin as a means of payment, cautiously and with measure while the currency is known.

Therefore, a financial education based on cryptocurrencies is necessary for the knowledge and use of bitcoin in Mexico, because, as already mentioned, the circulation and acceptance as a form of payment in various establishments is already on the way, albeit long, of generalize.

Future lines of research

Derived from the present study, it is considered that this research was applied to students of the Faculty of Public Accounting of the Benemérita Universidad Autónoma de Puebla, giving the guideline to future lines of research to apply other institutions in the country with complementary works on the subject, such as as regulation of cryptocurrencies, acceptance as a means of payment, accounting and tax regulation, as well as operation of blockchain in business finance.

Recommendations

Trying to understand the operation of mining can be complicated, so the accompaniment of a computer expert, as well as a network expert, is suggested. As a result of this research, the following agenda is included to start a study program, or a MOOC, that faces the challenge of this cryptocurrency.

Agenda proposal

- Module 1: Concept of bitcoin:
    - What are digital currencies?
    - The attractiveness of bitcoin.
    - Risks of bitcoin.
- Module 2: how bitcoin works:
    - What is the blockchain and what security does it offer?
    - How to become a miner?
    - Other technical concepts of bitcoin.
    - Anonymous nature of bitcoin.
    - How are Bitcoin created?
- Module 3: new business opportunities:
    - Most favored sectors.
    - Business models.
- Module 4: long-term perspectives:
    - The present of bitcoin.
    - The future of bitcoin.
- Module 5: practical case:
    - *Bitcoin and the business.*
    - *Bitcoin and the client.*
- Module 6: bitcoin as currency:
    - How to get bitcoins?
    - What is a purse?
    - How to pay with bitcoins?
    - How to accept bitcoins?

    - Where can you use bitcoins?
- Module 7: Fintech Law:
    - What, who and why?
    - Tax regulation in Mexico.
    - Regulation in other countries.
    - Sanctions.
- Module 8: financial reporting standards
    - International standards.
    - National standards.
    - Accounting records.

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