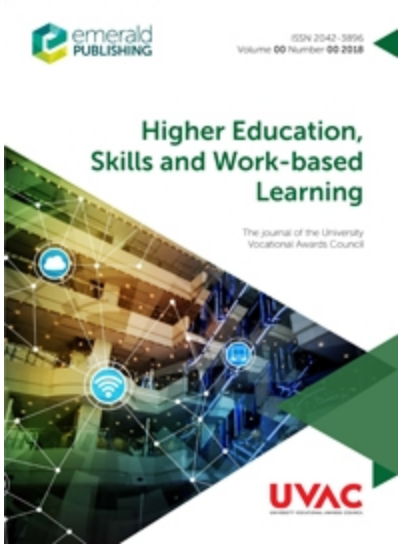

Cryptocurrencies in Accounting School?

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Cryptocurrencies in accounting school?

Abstract

Purpose — This study conducted to determine whether new CPAs and accounting graduate students have a comprehensive understanding of cryptocurrencies and the skills they need over their education years.

Design/methodology/approach — a qualitative analysis used through semi-structured interviews to provide an in-depth insight into the cryptocurrencies that could not be investigated easily through quantitative methods, and to provide an understanding of the context for cryptocurrencies from CPA and non-CPA students point of view. This was in addition to focusing on understanding the differences between the students' thoughts.

Findings — this study found that the recent accounting graduates and CPA members have the least awareness regarding cryptocurrencies, likely due to a lack of professors' comprehension or exposure to the issue. In addition, the students that involved with forensic courses have provided more information about cryptocurrencies compared with students that do not involved in this course.

Research limitations/implications — our data is limited for only a single country. Because cryptocurrencies are a relatively new notion in accounting, there is an alarming lack of legislation. Further, we found that recent accounting graduates and CPA members had the same level of knowledge of cryptocurrencies, most probably due to a lack of exposure or understanding by academics.

Practical implications — the different of students answers about cryptocurrencies have varied influence on understanding level of cryptocurrencies on this time.

Originality/value — This study has identified that the vast majority of accounting graduates lack adequate knowledge about cryptocurrencies or access to adequate resources despite understanding the fundamental concepts of cryptocurrency.

Keywords: Cryptocurrency; Accounting Graduates; Education; Knowledge; Professors.

Introduction

In recent years, the emergence of new technology has transformed business procedures. Experts have remarked that modern technology has considerably influenced the accounting profession (Al-Htaybat et al., 2018; Ferreira-Lopes et al., 2020). Integration is encouraged by the increasing significance of technology in the accounting and auditing professions (Centobelli et al., 2021). A fundamental understanding of the technological foundations of cryptocurrencies is required before making any judgments (Phillip et al., 2018), as more companies begin to invest in cryptocurrency and investors are more interested than ever. The absence of meaningful formal guidance from Generally Accepted Accounting Procedures (GAAP) standards on cryptocurrencies is a substantial impediment for stakeholders (Yatsyk, 2018). This is an essential subject for both accountants and players in the markets.

Cryptocurrency, which is categorised as an intangible asset under the current accounting standards (Vincent & Wilkins, 2020), has not received exceptional guidance from International Financial Reporting Standards (IFRS). As the Securities and Exchange Commission (SEC) maintains that several cryptocurrencies should be deemed securities (Hacker & Thomale, 2018), businesses should classify them as financial instruments as opposed to intangible assets (Vincent & Wilkins, 2020). In "Holdings of Cryptocurrencies – June 2019" (Tsuji, 2020), the IFRS Committee determined that bitcoin holdings are not financial assets. Recently, CPA Canada published "Audit Considerations Related to Cryptocurrency Assets and Transactions," which included mentioned intangible assets. How effectively are accountants equipped to deal with cryptocurrencies? This is an indispensable factor for both accountants and participants in the markets. The response to this question offers profound insight into the future of accountants and significantly impacts the valuations of financial reports.

This paper aims to determine whether accounting students have been introduced to cryptocurrencies and their handling in recent years. We surveyed students and recent accounting graduates majoring in accounting about their experience learning about cryptocurrency in their accounting programmes. Recent graduate students with accounting degrees and certifications tested their understanding of cryptocurrencies.

According to our findings, most students' core curricula do not provide a comprehensive discussion of cryptocurrencies. Instead, cryptocurrencies are only introduced as immaterial assets that must be reported in financial statements, and students are not instructed on auditing or assessing cryptocurrencies. Most students agree that their professors' lack of cryptocurrency understanding is evident. These results demonstrate that the quality of accounting graduates is hampered by an imbalanced relationship between academics and technological progress. One of the most influential studies (Qasim & Kharbat, 2020) presented the integrated technique for revamping courses at three levels (introductory, intermediate, and advanced) and technologies. Suppose no effort is made to modify the curriculum of the accounting profession. In that scenario, this issue will continue, and information technology (IT) graduates with technical abilities in blockchain, data analytics, and artificial intelligence will replace accounting graduates. In addition, we find that participants are concerned about cryptocurrencies and illegal activities. This study's primary contribution is to reveal the critical need for a prototype and more regulations from the IFRS covering cryptocurrency categories and data for auditors and accountants to comprehend the issues posed by cryptocurrencies, similar to the Financial Accounting Standards Board (FASB) as they issued new a handout for accounting for exchange-traded digital assets in May 2022.

Literature Review

Blockchain, DLT and decentralised

Cryptocurrencies such as bitcoin rely on blockchain technology. As the name suggests, blockchains are newer forms of distributed ledger technology (DLT) consisting of a database that keeps transaction data in ledgers in the form of distributed blocks. A block is a periodic ledger or container of data in computing. Each successive block contains the address of the previous block. A chain of cryptographically linked transaction bundles, or blocks, results from each block referencing the previous one (Perlman, 2019).

Periodically, an economic network may verify the authenticity of shared data using a decentralised blockchain. This general-purpose technology enables the trading of digital property rights and the creation of new kinds of digital platforms. These shared data might represent, among other sorts of contracts and digital assets, currency exchanges, intellectual property exchanges, stock exchanges, and

information exchanges (Rahman & Ali, 2020). A blockchain is a technique used by a community of users to maintain a shared transaction record. Through a consensus method, the community verifies each transaction. Consequently, verified transactions are recorded on the ledger of a blockchain network (Perlman, 2019).

DLT resolves difficulties relating to innovation or technology with shared and regulated data and the secure administration of diverse commercial transactions by numerous organisations (Sultan et al., 2018). The system relies on modern cryptographic proofs for distributed authentication in DLT. Data are stored in DLT blocks, continuously added and synced between participating nodes in particular networks (Perdana et al., 2021). However, governments and regulatory organisations prefer DLT to blockchain. A decentralised peer-to-peer network is used to conduct cryptocurrency transactions, obviating the requirement for a central authority (Kostić & Sedej, 2020; Vincent & Wilkins, 2020). Typical strategies would require the creation of a scheme governing body, adopting IT security standards, and integrating the necessary transaction verification processes into the design and architecture of the cryptocurrency. It would be possible to place operational and business continuity criteria directly on these authorities, such as screening investors or users. Because of this, restructuring the regulatory framework would not be necessary for centralised cryptocurrencies (Nabilou, 2019).

Decentralised cryptocurrency exchanges, or DExs, are like centralised exchanges but do not rely on a third party. In contrast to a centralised crypto exchange's IOU-based structure, these systems allow peer-to-peer (P2P) trade using assets, proxy tokens, or escrow mechanisms (Adams & Bailey, 2021). The monies exchanged in this transaction are all preserved on the blockchain. Some top cryptocurrency companies are built not to be censored and are decentralised, which is a crucial impediment to the direct regulation of cryptocurrencies: decentralised cryptocurrencies are hard to regulate without a centralised governance structure.

Cryptocurrencies under IFRS: Are they intangible assets?

Tokens can function as a unit of money or represent other value types as tradable assets. Tokens would be subject to securities legislation if they qualified as securities. Accounting standards do not yet exist for various challenges that accountants may encounter in practice; one such concern is

cryptocurrencies. Due to the lack of an accounting standard defining how cryptocurrency should be accounted for, accountants are compelled to use established accounting standards (Vincent & Wilkins, 2020). Cryptocurrency is an electronic or virtual version of money, implying an asset. Financial assets possess a contractual right that the holder can receive cash or another financial asset from any third party or trade financial assets or liabilities with the third party under potentially favourable conditions. Cryptocurrency holders do not usually possess this type of contractual right. Because of this, cryptocurrencies do not appear to fit the definition of a non-cash financial asset in IAS 32 and IFRS 9 (Barker & Teixeira, 2018). A financial asset's primary feature is the holder's contractual right to receive cash or another asset under favourable conditions in exchange for the firm's obligations. Most cryptocurrencies do not hold this right.

Therefore, cryptocurrencies seem to be excluded from the scope of IAS 32 and IFRS 9 (Barker & Teixeira, 2018). Since cryptocurrencies are not a currency, the IFRS declared that cryptocurrency ownership is not a financial asset, nor are securities issued by a third party. It confers no contractual rights on the holder and is not a contract that will or can be concluded via the holder's equity instruments.

IAS 38.8 defines an intangible asset as 'an identifiable non-monetary asset that lacks physical substance' (Barker & Teixeira, 2018). As a result, it appears that a sizable proportion of cryptocurrencies meet the criteria of intangible assets and, hence, come under the scope of IAS 38. If we analyse cryptocurrencies under IA38, the cryptocurrency may be recorded at cost (i.e., using the cost method) or at fair value (i.e., the revaluation method). If no factors suggest a finite useful life, cryptocurrencies are likely classified as indefinitely valuable intangibles, unlike fiat currencies such as the U.S. dollar and euro (Anvar kyzy et al., 2022).

Cryptocurrencies under the SEC: Are they securities?

Cryptocurrency and initial coin offerings are booming. The scope of these markets includes regional, national, and international players and an increasingly diverse spectrum of products and services. Investors and other market participants can face issues because of these developments. In such a market, U.S. federal law regulates investment companies and their operations and establishes industry

standards. President Franklin D. Roosevelt signed the Investment Advisers Act of 1940 (Moriarty, 2021), empowering the SEC to oversee investment trusts and counsellors. Four divisions comprise the SEC, and several divisions within it work towards the same goal of protecting investors, ensuring fair, organised and efficient markets, and promoting the interests of investors (McLelland et al., 2007).

Another statute is the Securities Act of 1933 (Bullock, 1934), referred to as the Truth in Securities Act (DiMarino & Roberson, 2020). According to the Securities Act of 1933, securities issuers sell securities to raise capital, make investments, or grow operations. These enterprises need investors to flourish, which incentivises issuers to showcase their companies in investor-friendly ways. The Securities Act's primary objective is that securities offered for sale must be free of deception, misrepresentation, and other types of fraud.

Because of the act, if investors can establish that critical information was not disclosed entirely or adequately, they have considerable recovery rights if they lose money while purchasing shares. According to Section 5 of the Securities Act, all issuers of non-exempt securities must register them with the SEC (di Marino & Roberson, 2013). The two steps to the registration process are detailed in Section 6. First, the issuer must provide data that serve as the basis for the prospectus sent to investors. Second, the issuer makes public material that will not appear in the prospectus (Bullock, 1934)

Some of its more recent actions have demonstrated that the SEC views cryptocurrencies that require digital assets to be registered as securities under Security Act 1933. For instance, in exchange for about 12 million Ether, the decentralised autonomous organisations (DAO) issued and sold around 1.15 billion DAO Tokens (Senderowicz et al., 2018). The SEC ruled that with DAO Tokens, DAO's bitcoin-based investment contracts, the term "investment contract" refers to a contract under which a party invests money in a joint venture with the intent to profit from the entrepreneurial endeavours of the other party (Goforth, 2021).

In another example, an SEC complaint was filed against DeFi Money Market ("DMM") earlier this year (SEC, 2021a). This platform allowed users to exchange Ether for redeemable tokens. A collateralised loan redeemed using Ether would pay a minimum interest rate of 6.25%. DMM would buy and retain such loans. DMM, however, did not hold these loans; one of its business associates did.

Even though DMM did not damage investors and gave them the interest promised, the SEC sued the company for breach of contract, among other things. DMM sold more than 30 million securities in unregistered offerings. Holders of DeFi Money Market governance (DMG) tokens may participate in certain voting rights, receive a portion of excess earnings, and benefit from DMG resales.

However, Director of Corporation Finance at SEC, said that "at least according to my understanding of Ether's decentralized structure, current Ether transactions are not securities" (Hinman, 2018). Ripple was sued for failing to undertake an initial coin offering (ICO), which Ethereum did. Ripple advanced this case in court, and the SEC claimed that Hinman's remark reflected merely his viewpoint, not the agency's. As previously indicated, the SEC seems to have differing opinions on whether a given cryptocurrency is a security, which will affect how regulators perceive cryptocurrencies and where to recognise them in financial statements.

Cryptocurrency and the CSQC

As part of the Canadian Standard on Quality Control (CSQC), audit firms must establish procedures for evaluating audit client acceptance and retention (Deloitte, 2009). Specifically, an audit firm's quality control procedures must provide reasonable assurance that the firm has the competence necessary to perform the engagement and has considered relevant risks appropriately. As such, an auditing firm should determine whether it has the expertise and resources necessary to satisfy customers. If expertise is lacking, audit firms must collaborate with accounting experts to assist with that project (M. E. Barth, 2008). Considerations that the auditor may make in gaining knowledge of the entity's relevant financial reporting structure and its application considering the entity's nature, circumstances, and surroundings are "Accounting for unusual or complex transactions including those in controversial or emerging areas (for example, accounting for cryptocurrency)" (CPA Canada, 2018).

Additionally, quality control requires the auditor to evaluate the risks in the engagement (Liu et al., 2017). Auditors must determine whether a reason exists to believe the client may be engaged in money laundering or other illegal activity. These kinds of activities are allowed by the anonymity of blockchain transaction participants. Therefore, the auditor's engagement acceptance or continuation procedures would certainly entail inquiries and associated procedures to ascertain the entity's business

purpose for engaging in cryptocurrency transactions for the first time or materially altering the nature or scope of its cryptocurrency practices.

Cryptocurrency in school accounting books

Accounting rules emphasise responsibility in preparing financial reports to reduce unethical conduct that might endanger stakeholders' assets. Meanwhile, experts concluded that ethical and responsible behaviour in generating financial reports begins in the classroom. Therefore, vital accounting education is necessary to improve the compilation of financial reports. According to Suryawathy and Putra (2016), Chief Financial Officers (CFOs) are worried about the quality of accounting education. Abayadeera et al. (2016) informed stakeholders of the significance of accounting skills for graduates. When accounting instructors can convey information (Suryawathy & Putra, 2016) and when the learning environment is conducive, these abilities are provided (Vroeijenstijn, 2003).

Furthermore, the globalisation and development of accounting, such as IFRS, impact accounting education (Needles Jr, 2010), increasing CFOs' demand for improved accountant skills (Mathews, 2001). These demands and rapid changes are fundamental requirements in the educational quality environment. In addition, most accounting books classify cryptocurrencies as intangible assets (Martin et al., 2020); the possibility that cryptocurrencies could be classified differently is not discussed.

Research questions

Accounting is in a state of transition, resulting in a crisis of competence among young employees (Lawson et al., 2014), and better accountants start in the classroom. Entry-level accountants of superior competence are needed (Jeffrey Wilks & Scott Showalter, 2021). According to DELORS (1999), instructors are responsible for communicating everything to learners. According to Andere (2015), instructors are education leaders, and their credentials and training, and the performance appraisal of experience and competencies to keep up with the need for advances and different technologies, are in greater demand. As a result, accounting instructors must be aware of the types of expertise and knowledge required for providing high-quality information and relevant guidance for future-focused choices (Azah Abdul Jalil et al., 2019). From the standpoint of students, we seek to gain a

greater understanding of whether or not educators have the necessary expertise in cryptocurrency technology through the following research questions:

RQ1: How do accounting professors introduce, explain, and debate cryptocurrencies during the academic years?

RQ2: During the academic years, have accounting professors debated the ethical concerns of cryptocurrencies?

As accounting and accountants evolve, they are affected by various factors, including the context within which they operate and the technological advances that affect the capture (Wells, P. K. 2018). Not uncommon are criticisms that the curriculum does not represent contemporary accounting practices (Mathews, 2001). In response to these curricular issues, the Accounting Education Change Commission in the United States recommended that beginning accounting courses be liberalised to represent better the aptitudes and abilities required for an ever-expanding array of employment prospects in accounting (Mathews, 1994). In publications including Bayerlein (2015) and Parker et al. (2011), efforts to resolve these curricular issues have primarily centred on the demand for developing non-technical accounting graduate skills. Nevertheless, Sundem (1999) discovered that practice had evolved more than contents and that the reaction to these requests for change remained restricted. Accordingly, we propose the following research question:

RQ3: Did accounting textbooks explain cryptocurrency in detail during your school years?

Due to diverse client goals throughout appropriateness engagements, accountants presumably require experience-based expertise to pick a relevant issue and create value for clients. To develop this expertise, accounting firms offer training programmes to assist new accountants. This means that firms examine new employees' competencies to identify development needs. Despite the increased interest in this area, no studies examine development programmes for accountants on cryptocurrency. Consequently, we propose our final research question:

RQ4: During your work, did accounting firms provide training on cryptocurrency?

RESEARCH METHOD

This study examines the knowledge, experiences and perceived outcomes of students who have completed CPA studies and recent graduates who enrol in a CPA programme. To investigate our research question, we conduct semi-structured interviews. These semi-structured interviews offer precise information on individual real-world students' experiences with cryptocurrencies, allowing us to understand better how they acquire crypto knowledge.

Additionally, our investigation allows, uniquely and directly, whatever aspect of the institution contributes to students' unfamiliarity with cryptocurrencies. Additionally, we were permitted to ask follow-up questions freely throughout our semi-structured interviews. As a result, we could delve further into students' understanding of and interest in cryptocurrency.

A virtual interview process was conducted with 57 recently qualified accountants. To ensure diversity across universities and colleges in Canada, we identified interviewees through our contacts. One co-author conducted a thorough question-by-question analysis in keeping with the study's interpretive focus (Hermanson et al., 2012). This co-author classified and categorised replies by their frequency of occurrence; the co-author conferred with the other co-authors as required. A second co-author evaluated the data file and chose quotes from interviews to publish. Along with the initial co-author, two more co-authors analysed the patterns of the results and quoted discussions for consistency with their perceptions. This study used Han's (2015) quoting method to present our results.

All participants received their credentials within the last five years. We estimate that government entities employ 35% of the population. Two-fifths (40%) are employed by major companies, whereas small companies employ 27%. Three-quarters (73%) of the participants invest in cryptocurrencies, although none of them analysed them in their job. Just over a third (35%) started to invest in cryptocurrencies while at school, the majority in 2019. All participants had to provide a copy of their degree certificates in accounting for reliability.

We apply a two-phase strategy to evaluate recent graduates' understanding of cryptocurrency and how they acquire this information. In the first phase, we construct an interview protocol and execute semi-structured interviews.

Semi-structured interviews

A sample population of 57 recent accounting graduates from five public universities and two public colleges enrolled in the CPA Canada programme participated in the interviews in 2021. The mean (median) age of interviewees was 28 (median: 24.5), they were primarily male (26%), and they had an average (median) of four years of job experience. The study focuses on the Canadian market since the researchers had access to participants there. The principal researcher teaches at a Canadian institution with access to individuals and accounting programme expertise in Canada.

Semi-structured interviews, guided by a set script, enabled us to explore cryptocurrency's fundamental positions among participants. This method conforms to various scholars' methods (Beasley et al., 2009). At least two study team members were present at each interview. Each interview lasted around 20 minutes, and all interviewees consented to be videotaped. Given the questions in the interview guide, interview responses were first categorised into topics and then into the survey's emerging themes. The experts reached a consensus on coded topics and themes through a series of iterations.

Results

Research Question 1

Our initial step in designing our interviews was to ascertain if the professors have accounting competence. Because 62% of respondents could provide concrete examples of their professor's superior accounting knowledge, students typically display confidence when assessing their professor's accounting knowledge and experience. According to respondents, accounting lecturers are mostly CPA graduates who have worked in major accounting firms. These skills and experiences aided significantly in the explanation of the accounting topic. The following quotations demonstrate this "discovery" of accounting professors' job skills and background.

> *"I have a pretty professional faculty to learn from. They know about vast things. They were so easy to approach. I remember three of my accounting professors worked at KPMJ. I think that helped us to learn more and better." (P2)*

> *"My lecturers used to offer us significant examples from their past job experience and provide us with difficulties that required us to collaborate to determine a solution [for] customers. I honestly thought this to be very fascinating... I discovered that I probably want to get further knowledge in this area." (P24)*

> *"Now that I work as an accountant, I think, 'Oh. I completely get all of the instances my instructors illustrated in class, and their expertise has increased my confidence in reaching this point at my present company.'" (P7)*

It is crucial to demonstrate that students can assess instructors' knowledge levels to ascertain if they can judge the instructors' understanding of cryptocurrency. Participants were asked if accounting instructors were aware of cryptocurrency and whether they discussed cryptocurrencies. The overwhelming majority of our participants were dissatisfied that their accounting instructors never covered cryptocurrency in class, even though the vast expertise of their accounting professors had benefitted them in general. A few individuals acknowledged that particular instructors discussed cryptocurrencies but not accounting treatments or auditing cryptos. These views are conveyed in the following quotations.

> *"My instructors used to insist that we must live in the present. So, to live, individuals must learn new things. As a result, they spent time talking about cryptocurrencies but were never about financial treatment. " (P15)*

> *"My professors are knowledgeable, but they have never really discussed such topics… I do not recall any of them ever mentioning bitcoins." (P8)*

> *"Cryptocurrency or bitcoin should be taught to students…. Regrettably, our lecturers never fully addressed such issues in class and the ones who did were against bitcoins." (P17)*

This result helps explain the varying knowledge and abilities of accounting professors. According to participants, they have a high degree of confidence in their capacity to determine the level of expertise of certain lecturers. The differences between accounting university graduates and college professors

regarding their knowledge and skills are not substantial. This diversity of experience of accounting professors is consistent with prior studies (Bhaskar, 1983; Bolzan, 2010; Romney, 1983); it demonstrates the profession's willingness to hire academics with diverse skill sets. Most of the findings correctly recognised the academics' lack of knowledge about cryptocurrency. Academics' lack of expertise in cryptocurrency may have contributed to these conclusions. Another probable explanation is that most accounting professors earned their degrees before cryptocurrencies were introduced, rendering them incapable of educating students.

Research Question 2

J. R. Barth et al. (2020) explored the impact of ethical and immoral conduct on the value of cryptocurrencies. Ethical concerns about their usage impact cryptocurrencies' value. In this study, we explored the ethical implications of cryptocurrencies to determine if professors avoid them because of ethical concerns and their belief systems. We learned that many participants' professors were concerned about cryptocurrencies and ethics, corresponding to an earlier study (Vincent & Wilkins, 2020). We inquired about the respondents' and their professors' perspectives on cryptocurrencies to evaluate whether they shared the same perspective.

According to most respondents, cryptocurrencies are primarily used for money laundering, illegal currency exchanges and platforms, and underground black markets. Expectedly, participants whose instructor was opposed to cryptocurrencies were hostile to cryptocurrency investments and transactions. In addition, our findings show that the worries mentioned during the interview did not stop most accounting graduates from investing in cryptocurrencies. Due to a lack of awareness and ethical challenges, participants are learning more about crypto concerning accounting and audit procedures. They feel that cryptocurrencies will not vanish due to ethical concerns as more significant corporations invest in bitcoins. These views are conveyed in the following quotations.

> *"It is well known that drug dealers use cryptocurrencies." (P14)*

> *"There are so many issues surrounding bitcoin, take real states in Canada as an example, how international money is being used to legitimate the money." (P4)*

"I have many concerns about crypto…… drugs being the main reason." (P31)

"I do think cryptocurrency is here to stay……. If governments issued their cryptocurrency in a few years, we would not see the mess in the market… and illegal activities will disappear." (P22)

"I recall my professors talking about bitcoins and how drug dealers are using bitcoin… I feel it is better to be far away for now from bitcoin." (P27)

Research Question 3

Regarding whether accounting textbooks include cryptocurrencies, students have differing viewpoints. More than half of the respondents said that cryptocurrencies were never discussed in their books. These views are conveyed in the following quotations.

"I have never read anything about it in the previous version of books. Probably, the new versions may contain a little information on it." (P41)

"I do not remember having encountered such a subject during my accounting studies in the books. I would remember if I saw it, given that I had reviewed my accounting books while preparing for my CPA." (P52)

"I had never seen it, even when I was studying for my CPA. I went through all my CPA materials and CPA competencies books; I never had the opportunity to read about them… I firmly believed that no textbook stated anything about crypto." (P39)

The remaining participants reported that the textbook devoted just one page to cryptography without providing examples or problems, or if it did, it did so unhelpfully. Students agree that the book's material on intangibles covers cryptocurrency. According to them, the handling of cryptocurrency in the book was insufficient for the subject since an increasing number of businesses embrace cryptocurrencies. These views are conveyed in the following quotations.

> *"I remember that my intermediate accounting volume 2 accounting textbook discussed cryptocurrency, but I think it was an introduction page, maybe in a one or two page only and was classified as intangible assets." (P30)*

> *"Since I am investing in crypto, this caught my attention… I think there was one column in one of the chapters." (P9)*

Respondents were able to offer precise justifications for their positions in answer to a subsequent inquiry. Their responses centred on crypto as a new problem, and future textbooks will need more resources to accommodate the growing number of crypto investors. Students cited the writers' lack of knowledge regarding cryptocurrency as a contributing factor. These views are conveyed in the following quotations.

> *"I do not believe the textbook included information about bitcoin, which is a new subject. It may take a few years before doing so." (P24)*

> *"I think the book's author has no depth knowledge about crypto, so they did not expand on the subject……. Remember, it is a very new subject…., and people still test the water." (P29)*

> *"I think if more people and companies invest in crypto, the more demand for information's needed. Which I believe will be in new editions of accounting textbook." (P51)*

This result indicates a dearth of information available in the textbook. Whether or not the interviewees stated that the cryptocurrency was discussed in the book, the fact remains that it was barely mentioned, indicating that students are incapable of addressing the accounting treatment of a cryptocurrency. This result contradicts prior research (Hammond et al., 2015). As a result of their examination of accounting textbooks, which revealed that accounting textbooks are being revised at an accelerating rate and that accounting professors believe the rate of change should be slowed, faculty members who are not textbook authors deem frequent textbook revisions to be of diminishing value.

Research Question 4

It is acknowledged that the range of duties of experienced accountants has expanded in recent years. Most accounting companies accept 'suitable' relevant job experience if a prospective member works under the guidance of a competent member in specific areas. Most universities and colleges in Canada provide an accounting co-op designed for students interested in acquiring work experience in accounting firms. Students in accounting must complete one semester working for a firm to be able to graduate from the programme. All participants completed the programme in their current or prior place of employment. Participants report that their work while in school was an entry-level role and that the training they obtained was relevant to their daily duties and understanding of the firm structures. Many in-hire positions reported that their training was only related to the new job and did not extend to other areas, such as cryptocurrencies. Few participants indicated that their firm has a specialist department and personnel who deal with cryptocurrency investment, yet they have no interaction due to the nature of their jobs. These views are conveyed in the following quotations.

> *"I have been investing in cryptocurrency since 2019. Thus, I have been acquainted with it. Nevertheless, I have never been trained at work about classifying crypto." (P11)*

> *"Last year, I started my job as an account receivable clerk; I have been reading much about it since my co-op was mainly about bookkeeping while I was at school……my firm does not deal with crypto; it is a small firm……. My supervisor invests in crypto; we sometimes discuss the crypto but not in terms of accounting classification auditing." (P26)*

> *"I was surprised when I learned that we have a specialist in crypto in our firms. Some of our companies invest in crypto……. But I rarely see or talk to the people who deal with crypto investors." (P31)*

> *"My work is not related to crypto, and as a result, I have not been informed about it. Even though we have a large number of firms who invest in crypto……our*

database has information about crypto to read, but it's only accessible for people whose work relates to bitcoin." (P2)

"Since I completed school, I have worked as an auditor at the government agency; so far, I did not have any clients who invested in crypto. Therefore, I never had training. I do not recall anyone at my workplace discussing the crypto… most of them believe it is a scam……but as we provide public service, I think we should know about crypto." (P27)

Conclusion

Since cryptocurrency is a relatively new concept in accounting, laws are alarmingly absent. The challenges presented by the SEC in its quest to regulate cryptocurrencies and classify most of them as financial securities put pressure on the international standard to assess its definition of security through the lens of IFRS and offer a more accurate classification of cryptocurrency. While student investors are aware of the underlying principles of cryptocurrency, most graduates with accounting degrees continue to face difficulties due to a lack of knowledge about cryptocurrencies or a lack of resources.

Additionally, we discovered that recent accounting graduates have only the slightest awareness regarding cryptocurrencies, likely due to a lack of professors' comprehension or exposure to the issue. Our primary contribution understands if accounting graduates are prepared to do accounting and auditing work in the future regarding cryptocurrencies.

Some may argue that time is impacting the progress of cryptocurrencies more quickly than anybody anticipated. Although this may be true, cryptocurrencies have been on the market since 2011 and received substantial investment acceptance from companies in 2017. Since then, several textbooks have been revised and no longer include the appropriate section on cryptocurrencies. Another objection might be made about the instructors' expertise in cryptocurrencies since the subject was not featured in the textbook and was thus not discussed in class. This is a reasonable point; however, most participants report that they discuss cryptocurrencies with their professors; either they are opposed to cryptocurrency for ethical reasons or have a limited understanding of it.

Several actions can be taken by schools in response to these findings, including collaboration with the CPA, regulators, and academic book authors to provide more resources about cryptocurrencies. Accounting schools should educate academics on cryptocurrencies and encourage instructors to include cryptocurrency-related content in their courses. Furthermore, we suggest that accounting textbooks should contain a section on cryptocurrencies. Students should learn about cryptocurrencies through CPA Canada's cryptocurrency exams. In addition to developing criteria for evaluating whether cryptocurrencies qualify as securities, IFRS committees should comprehensively examine cryptocurrency classification.

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Cryptocurrencies in accounting school?

Abstract

Purpose — This study was conducted to determine whether new Certified Public Accountant (CPAs) and accounting graduate students have a comprehensive understanding of cryptocurrencies and the skills they need over their education years.

Design/methodology/approach — A qualitative analysis was used through semi-structured interviews to provide an in-depth insight into the cryptocurrencies that could not be investigated easily through quantitative methods, and to provide an understanding of the context for cryptocurrencies from CPA and non-CPA students' point of view. This was in addition to focusing on understanding the differences between the students' thoughts.

Findings — This study found that the recent accounting graduates and CPA members have the least awareness regarding cryptocurrencies, likely due to a lack of professors' comprehension or exposure to the issue. In addition, the students involved with forensic courses have provided more information about cryptocurrencies compared with students that were not involved in this course.

Research limitations/implications — Our data are limited for only a single country. Because cryptocurrencies are a relatively new notion in accounting, there is an alarming lack of legislation. Further, we found that recent accounting graduates and CPA members had the same level of knowledge of cryptocurrencies, most probably due to a lack of exposure or understanding by academics.

Practical implications — The different students' answers about cryptocurrencies have varied influence on the current level of understanding about cryptocurrencies.

Originality/value — This study has identified that the vast majority of accounting graduates lack adequate knowledge about cryptocurrencies or access to adequate resources despite understanding the fundamental concepts of cryptocurrency.

Keywords: Cryptocurrency; Accounting Graduates; Education; Knowledge; Professors.

1. Introduction

In recent years, the emergence of new technology has transformed business procedures (Shaban, 2020). Experts have remarked that modern technology has considerably influenced the accounting profession (Al-Htaybat et al., 2018; Ferreira-Lopes et al., 2020). Integration is encouraged by the increasing significance of technology in the accounting and auditing professions (Centobelli et al., 2021); however, a fundamental understanding of the technological foundations of cryptocurrencies is required before making any judgements (Phillip et al., 2018), as more companies begin to invest in cryptocurrency and investors are more interested than ever. The absence of meaningful formal guidance from Generally Accepted Accounting Procedures (GAAP) standards on cryptocurrencies is a substantial impediment for stakeholders (Yatsyk, 2018). This is an essential subject for both accountants and players in the markets.

Cryptocurrency, which is categorised as an intangible asset under the current accounting standards (Vincent & Wilkins, 2020), has not received exceptional guidance from International Financial Reporting Standards (IFRS). As the Securities and Exchange Commission (SEC) maintains that several cryptocurrencies should be deemed securities (Hacker & Thomale, 2018), businesses should classify them as financial instruments as opposed to intangible assets (Vincent & Wilkins, 2020). In “Holdings of Cryptocurrencies – June 2019” (Tsuji, 2020), the IFRS Committee determined that bitcoin holdings are not financial assets. Recently, CPA Canada published "Audit Considerations Related to Cryptocurrency Assets and Transactions", which included mention of intangible assets. How effectively are accountants equipped to deal with cryptocurrencies? This is an indispensable factor for both accountants and participants in the markets. The response to this question offers profound insight into the future of accountants and significantly affects the valuations of financial reports.

This paper aims to determine whether accounting students have been introduced to cryptocurrencies and their handling in recent years. We surveyed students and recent accounting graduates majoring in accounting about their experience learning about cryptocurrency in their accounting programmes. Recent graduate students with accounting degrees and certifications were tested regarding their understanding of cryptocurrencies.

Cryptocurrencies can have various implications for graduate students, both as investors and as participants in the cryptocurrency industry. Cryptocurrencies can offer graduate students new investment opportunities, either as a speculative investment or as a long-term investment in the

future of blockchain technology. However, graduate students should carefully evaluate the risks and benefits of investing in cryptocurrencies, as the market can be highly volatile and subject to market manipulation. In addition, cryptocurrencies can offer graduate students new opportunities for investment, research, job-seeking, and entrepreneurship. However, they should carefully evaluate the risks and benefits of engaging with the cryptocurrency industry and should be prepared to adapt to the rapid changes and uncertainties that are characteristic of the industry.

According to our findings, most students' core curricula do not provide a comprehensive discussion of cryptocurrencies. Instead, cryptocurrencies are only introduced as immaterial assets that must be reported in financial statements, and students are not instructed on auditing or assessing cryptocurrencies. Most students agree that their professors' lack of cryptocurrency understanding is evident. These results demonstrate that the quality of accounting graduates is hampered by an imbalanced relationship between academics and technological progress. One of the most influential studies (Qasim & Kharbat, 2020) presented the integrated technique for revamping courses at three levels (introductory, intermediate, and advanced) and technologies. Suppose no effort is made to modify the curriculum of the accounting profession. In that scenario, this issue will continue and information technology (IT) graduates with technical abilities in blockchain, data analytics and artificial intelligence will replace accounting graduates. In addition, we find that participants are concerned about cryptocurrencies and illegal activities. This study's primary contribution is to reveal the critical need for a prototype and more regulations from the IFRS covering cryptocurrency categories and data for auditors and accountants to comprehend the issues posed by cryptocurrencies (Ramassa & Leoni, 2022), similar to the Financial Accounting Standards Board (FASB) which issued a new handout for accounting for exchange-traded digital assets in May 2022.

2. Literature Review

Blockchain, DLT and decentralised

Cryptocurrencies such as bitcoin rely on blockchain technology (Shaban, 2020). As the name suggests, blockchains are newer forms of distributed ledger technology (DLT) consisting of a database that keeps transaction data in ledgers in the form of distributed blocks. A block is a periodic ledger or container of data in computing. Each successive block contains the address of the previous block; a chain of cryptographically linked transaction bundles, or blocks, results from each block referencing the previous one (Perlman, 2019).

Periodically, an economic network may verify the authenticity of shared data using a decentralised blockchain. This general-purpose technology enables the trading of digital property rights and the creation of new kinds of digital platforms. These shared data might represent, among other sorts of contracts and digital assets, currency exchanges, intellectual property exchanges, stock exchanges, and information exchanges (Rahman & Ali, 2020). A blockchain is a technique used by a community of users to maintain a shared transaction record. The community verifies each transaction through a consensus method and verified transactions are consequently recorded in the ledger of a blockchain network (Perlman, 2019).

DLT resolves difficulties relating to innovation or technology with shared and regulated data and the secure administration of diverse commercial transactions by numerous organisations (Sultan et al., 2018). The system relies on modern cryptographic proofs for distributed authentication in DLT. Data are stored in DLT blocks, continuously added and synced between participating nodes in particular networks (Perdana et al., 2021). However, governments and regulatory organisations prefer DLT to blockchain. A decentralised peer-to-peer network is used to conduct cryptocurrency transactions, obviating the requirement for a central authority (Kostić & Sedej, 2022; Vincent & Wilkins, 2020). Typical strategies would require the creation of a scheme governing body, adopting IT security standards, and integrating the necessary transaction verification processes into the design and architecture of the cryptocurrency. It would be possible to place operational and business continuity criteria directly on these authorities, such as screening investors or users. Because of this, restructuring the regulatory framework would not be necessary for centralised cryptocurrencies (Nabilou, 2019).

Decentralised cryptocurrency exchanges, or DExs, are like centralised exchanges but do not rely on a third party. In contrast to a centralised crypto exchange's IOU-based structure, these systems allow peer-to-peer (P2P) trade using assets, proxy tokens, or escrow mechanisms (Adams & Bailey, 2021). The monies exchanged in this transaction are all preserved in the blockchain. Some top cryptocurrency companies are, however, built not to be censored and are decentralised, which is a crucial impediment to the direct regulation of cryptocurrencies: decentralised cryptocurrencies are hard to regulate without a centralised governance structure.

In summary, blockchain is a type of DLT that is decentralised, and decentralisation is a key aspect of both blockchain and DLT technologies. DLT is a broader term that encompasses all types of decentralised and distributed ledger technologies, including blockchains.

Cryptocurrencies Under IFRS: Are They Intangible Assets?

Tokens can function as a unit of money or represent other value types as tradable assets. Tokens would be subject to securities legislation if they qualified as securities. Accounting standards do not yet exist for various challenges that accountants may encounter in practice; one such concern is cryptocurrencies. Due to the lack of an accounting standard defining how cryptocurrency should be accounted for, accountants are compelled to use established accounting standards (Vincent & Wilkins, 2020). Cryptocurrency is an electronic or virtual version of money, implying an asset. Financial assets possess a contractual right that the holder can receive cash or another financial asset from any third party or trade financial assets or liabilities with the third party under potentially favourable conditions. However, cryptocurrency holders do not usually possess this type of contractual right. Because of this, cryptocurrencies do not appear to fit the definition of a non-cash financial asset in IAS 32 and IFRS 9 (Barker & Teixeira, 2018). A financial asset's primary feature is the holder's contractual right to receive cash or another asset under favourable conditions in exchange for the firm's obligations. Again, most cryptocurrencies do not hold this right and seem to be excluded from the scope of IAS 32 and IFRS 9 (Barker & Teixeira, 2018). Since cryptocurrencies are not a currency, the IFRS declared that cryptocurrency ownership is not a financial asset, nor are securities issued by a third party. It confers no contractual rights on the holder and is not a contract that will or can be concluded via the holder's equity instruments.

The classification of cryptocurrencies under International Financial Reporting Standards (IFRS) is a matter of debate and interpretation. Currently, there is no specific guidance on how to classify cryptocurrencies under IFRS. However, it is generally considered that cryptocurrencies may be classified as intangible assets under IFRS, if they meet the definition of an intangible asset as stated in IFRS 38. According to IFRS 38, an intangible asset is an identifiable non-monetary asset without physical substance. To meet this definition, a cryptocurrency would need to have specific attributes, such as an identifiable and distinct set of rights and obligations, the ability to generate future economic benefits, and the ability to be sold, transferred or exchanged (Anvar Kyzy et al., 2022; Chou et al., 2022;). Therefore, if a cryptocurrency meets the definition of an intangible asset, it would be recorded as an intangible asset on the company's balance sheet, with any changes in its fair value being recognised in the company's income statement.

In conclusion, it is important to note that the classification of cryptocurrencies as intangible assets under IFRS is still subject to interpretation and may be different in different jurisdictions.

Companies and their auditors should exercise judgement and carefully consider the specific facts and circumstances in each case to determine the most appropriate classification under IFRS.

Cryptocurrencies Under The SEC: Are They Securities?

Cryptocurrency and initial coin offerings are booming. The scope of these markets includes regional, national, and international players and an increasingly diverse spectrum of products and services. Investors and other market participants can face issues because of these developments. In such a market, U.S. federal law regulates investment companies and their operations and establishes industry standards. President Franklin D. Roosevelt signed the Investment Advisers Act of 1940 (Moriarty, 2021), empowering the SEC to oversee investment trusts and counsellors. The SEC is comprised of four divisions and several divisions within it work towards the same goal of protecting investors, ensuring fair, organised and efficient markets, and promoting the interests of investors (Jorgensen et al., 2007).

However, while the SEC has not issued a definitive ruling on whether all cryptocurrencies are securities, in its guidance, it has stated that many cryptocurrencies may be considered securities and, therefore, subject to federal securities laws (Quamara & Singh, 2022). The SEC applies the Howey test, a court-created test, to determine whether a particular investment is a security. According to the Howey test, an investment is a security if it involves an investment of money in a common enterprise with the expectation of profits predominantly from the efforts of others. Based on this definition, the SEC has indicated that many initial coin offerings (ICOs) and other cryptocurrency offerings may be considered securities offerings, and, therefore, subject to federal securities laws. For example, if a cryptocurrency is marketed as an investment opportunity and promises a return on investment, the SEC may view it as a security (Hacker & Thomale, 2018).

Another statute is the Securities Act of 1933 (Bullock, 1934), referred to as the Truth in Securities Act (DiMarino & Roberson, 2020). According to the Act securities issuers sell securities to raise capital, make investments, or grow operations. These enterprises need investors to flourish, which incentivises issuers to showcase their companies in investor-friendly ways. The Securities Act's primary objective is that securities offered for sale must be free of deception, misrepresentation, and other types of fraud.

Because of the Act, if investors can establish that critical information was not disclosed entirely or adequately, they have considerable recovery rights if they lose money while purchasing shares.

According to Section 5 of the Securities Act, all issuers of non-exempt securities must register them with the SEC (DiMarino & Roberson, 2013). The two steps to the registration process are detailed in Section 6. First, the issuer must provide data that serve as the basis for the prospectus sent to investors. Second, the issuer makes public material that will not appear in the prospectus (Bullock, 1934)

Some of its more recent actions have demonstrated that the SEC views cryptocurrencies that require digital assets to be registered as securities under Security Act 1933. For instance, in exchange for about 12 million Ether, the decentralised autonomous organisations (DAO) issued and sold around 1.15 billion DAO Tokens (Senderowicz et al., 2018). The SEC ruled that, with DAO Tokens, DAO's bitcoin-based investment contracts, the term "investment contract" refers to a contract under which a party invests money in a joint venture with the intent to profit from the entrepreneurial endeavours of the other party (Goforth, 2021). In another example, an SEC complaint was filed against DeFi Money Market (DMM) earlier this year (SEC, 2021a). This platform allowed users to exchange Ether for redeemable tokens. A collateralised loan redeemed using Ether would pay a minimum interest rate of 6.25%. DMM would buy and retain such loans. DMM, however, did not hold these loans; one of its business associates did. Even though DMM did not damage investors and gave them the interest promised, the SEC sued the company for breach of contract, among other things. DMM sold more than 30 million securities in unregistered offerings. Holders of DeFi Money Market governance (DMG) tokens may participate in certain voting rights, receive a portion of excess earnings, and benefit from DMG resales.

However, the Director of Corporation Finance at SEC said "at least according to my understanding of Ether's decentralized structure, current Ether transactions are not securities" (Hinman, 2018). Ripple was sued for failing to undertake an initial coin offering (ICO), which Ethereum did. Ripple advanced this case in court, and the SEC claimed that Hinman's remark reflected merely his viewpoint, not the agency's. As previously indicated, the SEC seems to have differing opinions on whether a given cryptocurrency is a security, which will affect how regulators perceive cryptocurrencies and where to recognise them in financial statements.

Finally, it is essential to note that the classification of cryptocurrencies as securities is a fact-specific determination and may vary depending on the specific facts and circumstances of each case. Companies and individuals involved in cryptocurrency offerings should carefully consider the applicable laws and regulations and consult with legal counsel to determine the appropriate regulatory treatment of their offerings.

Cryptocurrency and the CSQC

As part of the Canadian Standard on Quality Control (CSQC), audit firms must establish procedures for evaluating audit client acceptance and retention (Deloitte, 2009). Specifically, an audit firm's quality control procedures must provide reasonable assurance that the firm has the competence necessary to perform the engagement and has considered relevant risks appropriately. As such, an auditing firm should determine whether it has the expertise and resources necessary to satisfy customers. If expertise is lacking, audit firms must collaborate with accounting experts to assist with that project (Barth, 2008). Considerations that the auditor may make in gaining knowledge of the entity's relevant financial reporting structure and its application considering the entity's nature, circumstances, and surroundings are "Accounting for unusual or complex transactions including those in controversial or emerging areas (for example, accounting for cryptocurrency)" (CPA Canada, 2018).

Additionally, quality control requires the auditor to evaluate the risks in the engagement (Liu et al., 2017). Auditors must determine whether a reason exists to believe the client may be engaged in money laundering or other illegal activity. These kinds of activities are allowed by the anonymity of blockchain transaction participants. Therefore, the auditor's engagement acceptance or continuation procedures would certainly entail inquiries and associated procedures to ascertain the entity's business purpose for engaging in cryptocurrency transactions for the first time or materially altering the nature or scope of its cryptocurrency practices.

Cryptocurrency in School Accounting Books

Accounting rules emphasise responsibility in preparing financial reports to reduce unethical conduct that might endanger stakeholders' assets. Meanwhile, experts have concluded that ethical and responsible behaviour in generating financial reports begins in the classroom. Therefore, vital accounting education is necessary to improve the compilation of financial reports. According to Suryawathy and Putra (2016), Chief Financial Officers (CFOs) are worried about the quality of accounting education. Abayadeera et al. (2016) informed stakeholders of the significance of accounting skills for graduates. When accounting instructors can convey information (Suryawathy & Putra, 2016) and when the learning environment is conducive, these abilities are provided (Vroeijenstijn, 2003).

Furthermore, the globalisation and development of accounting, such as IFRS, affects accounting education (Needles Jr, 2010), increasing CFOs' demand for improved accountant skills (Mathews, 2001). These demands and rapid changes are fundamental requirements in the educational quality environment. In addition, most accounting books classify cryptocurrencies as intangible assets (Martin et al., 2020); the possibility that cryptocurrencies could be classified differently is not discussed.

Cryptocurrency Accounting and Theoretical Framework

Cryptocurrency accounting and framework theories are still evolving, as the use of cryptocurrencies and their underlying blockchain technology is relatively new. However, several theoretical frameworks have been proposed to help accountants and financial professionals understand how to approach accounting for cryptocurrencies and related transactions. One framework that has been proposed is based on the concept of "real options" which considers the potential future value of a cryptocurrency investment and how that value can be realised (Sumarti et al., 2021). This framework considers the uncertainty of cryptocurrency prices and the ability of investors to make decisions based on that uncertainty. Another framework that has been proposed is based on the "information economics" perspective, which views cryptocurrencies as a source of information about the state of the underlying blockchain network (Caferra, 2022; Marthinsen & Gordon, 2021). This framework considers the role of cryptocurrencies in facilitating the transfer of information and the creation of value, as well as the impact of network effects on the overall value of a cryptocurrency investment.

In terms of actual accounting for cryptocurrencies, there are currently no globally accepted standards for how to account for cryptocurrencies in financial statements. However, some guidance has been provided by organisations such as the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB), which have issued information on how to account for cryptocurrencies in general purpose financial statements.

In conclusion, while there is still much work to be done to fully understand the implications of cryptocurrency accounting; the existing frameworks and guidance can provide a starting point for accountants and financial professionals as they work to develop a comprehensive approach to accounting for cryptocurrencies.

3. Research Questions

Accounting is in a state of transition, resulting in a crisis of competence among young employees (Lawson et al., 2014), and better accountants start in the classroom. Entry-level accountants of superior competence are needed (Showalter & Wilks, 2021). According to Delors (1999), instructors are responsible for communicating everything to learners. Andere (2015) documented that instructors are education leaders, and their credentials and training, and the performance appraisal of experience and competencies to keep up with the need for advances and different technologies, are in greater demand. As a result, accounting instructors must be aware of the types of expertise and knowledge required for providing high-quality information and relevant guidance for future-focused choices (Jalil et al., 2019). From the standpoint of students, we seek to gain a greater understanding of whether or not educators have the necessary expertise in cryptocurrency technology through the following research questions:

RQ1: How do accounting professors introduce, explain, and debate cryptocurrencies during the academic years?

Our study focused to explain the cryptocurrencies in accounting classes might vary depending on the instructor's personal views and the specific course being taught. However, some common ways accounting professors may introduce, explain and debate cryptocurrencies in their classes include accounting professors, which may begin by explaining what cryptocurrencies are and how they function, including their underlying technology, such as blockchain, and how they differ from traditional fiat currencies. Accounting implications, whereby the accounting professors may then explain the accounting implications of cryptocurrencies, such as the challenges in valuation, the need for proper disclosures, and the potential impact on financial statements, as well as the regulation should be discussed to show the current regulatory landscape for cryptocurrencies, including the varying approaches taken by different countries, and the implications for companies and investors (Ammous, 2018). In summary, the introduction, explanation and debate of cryptocurrencies in accounting classes may vary, but, generally, accounting professors aim to provide students with a comprehensive understanding of the accounting implications of these emerging technologies, and to encourage critical thinking and analysis of their potential impact on the financial system.

RQ2: During the academic years, have accounting professors debated the ethical concerns of cryptocurrencies?

As accounting and accountants evolve, they are affected by various factors, including the context within which they operate and the technological advances that affect the capture (Wells, 2018). The curriculum for accounting education is often criticised for needing to represent contemporary accounting practices fully. This can be due to a variety of reasons, including the slow pace of change, emphasis on traditional accounting methods, lack of industry involvement, lack of practical experience, and that accounting education often lacks opportunities for students to gain valuable experience in real-world accounting scenarios, which can limit their exposure to contemporary accounting practices (Mathews, 2001). In response to these curricular issues, the Accounting Education Change Commission in the United States recommended that beginning accounting courses be liberalised to represent better the aptitudes and abilities required for an ever-expanding array of employment prospects in accounting (Mathews, 1994). In publications including Parker et al. (201 and Bayerlein (2015) efforts to resolve these curricular issues have primarily centred on the demand for developing non-technical accounting graduate skills. Nevertheless, Sundem (1999) discovered that practice had evolved more than contents and that the reaction to these requests for change remained restricted. Accordingly, we propose the following research question:

> ***RQ3: Did accounting textbooks explain cryptocurrency in detail during your school years?***

Cryptocurrencies are a relatively new development, and their impact on the accounting profession is still evolving. While some accounting textbooks may briefly mention cryptocurrencies, they are generally not covered in depth. Instead, accounting professors may supplement their courses with additional readings, case studies, and other materials to provide students with a more comprehensive understanding of this emerging area (e.g., Abayadeera et al., 2016; Suryawathy & Putra, 2016; Vroeijenstijn, 2003). It is likely that, as the use and impact of cryptocurrencies continues to grow, they will receive more attention in accounting textbooks and courses in the future.

Due to diverse client goals throughout appropriateness engagements, accountants presumably require experience-based expertise to pick a relevant issue and create value for clients. To develop this expertise, accounting firms offer training programmes to assist new accountants. This means that firms examine new employees' competencies to identify development needs. Despite the increased interest in this area, no studies examine development programmes for accountants on cryptocurrency. Consequently, we propose our final research question:

RQ4: During your work, did accounting firms provide training on cryptocurrency?

Recently, many accounting firms have begun to provide training on cryptocurrency to their employees. As the use of cryptocurrencies becomes more widespread, accounting firms are recognising the importance of having a knowledgeable workforce that understands the accounting implications of these emerging technologies (Stern & Reinstein, 2021). The nature and extent of cryptocurrency training provided by accounting firms can, however, vary widely, ranging from brief overviews to comprehensive courses. Some firms may offer in-house training sessions or workshops, while others may provide online courses or other training materials. The training may focus on a range of topics, including the basics of cryptocurrencies, the accounting and financial reporting implications, and the regulatory landscape. Overall, providing training on cryptocurrency is becoming increasingly important for accounting firms as the use of these technologies continues to grow, and it is likely that this trend will continue in the future.

4. Research Method

This study examines the knowledge, experiences and perceived outcomes of students who have completed CPA studies and recent graduates who enrol in a CPA programme. To investigate our research question, we conduct semi-structured interviews. These semi-structured interviews offer precise information on individual real-world students' experiences with cryptocurrencies, allowing us to understand better how they acquire crypto knowledge. Additionally, our investigation allows, uniquely and directly, whatever aspect of the institution contributes to students' unfamiliarity with cryptocurrencies. Additionally, we were permitted to ask follow-up questions freely throughout our semi-structured interviews. As a result, we could delve further into students' understanding of and interest in cryptocurrency.

A virtual interview process was conducted with 57 recently qualified accountants. To ensure diversity across universities and colleges in Canada, we identified interviewees through our contacts. One co-author conducted a thorough question-by-question analysis in keeping with the study's interpretive focus (Hermanson et al., 2012). This co-author classified and categorised replies by their frequency of occurrence; the co-author conferred with the other co-authors as required. A second co-author evaluated the data file and chose quotes from interviews to publish. Along with the initial co-author, two more co-authors analysed the patterns of the results and quoted discussions for consistency with their perceptions. This study used Han's (2015) quoting method to present our results.

All participants received their credentials within the last five years. We estimate that government entities employ 35% of the population. Two-fifths (40%) are employed by major companies, whereas small companies employ 27%. Three-quarters (73%) of the participants invest in cryptocurrencies, although none of them analysed them in their job. Just over a third (35%) started to invest in cryptocurrencies while at school, the majority in 2019. All participants had to provide a copy of their degree certificates in accounting for reliability. We apply a two-phase strategy to evaluate recent graduates' understanding of cryptocurrency and how they acquire this information. In the first phase, we construct an interview protocol and execute semi-structured interviews.

4.1. Semi-Structured Interviews

Overall, semi-structured interviews can be a valuable tool for studying cryptocurrencies, as they allow researchers to collect rich, detailed data on participants' experiences, perspectives, and behaviours (Obreja, 2022). We conducted interviews with 57 recent accounting graduates. We randomly selected the sample from five public universities and two public colleges enrolled in the CPA Canada programme participated in the interviews in 2021.

Table 1 summarises the characteristics of the interviewees, including education, qualifications, age, gender and experience. As shown, most of our interviews were with accountants (67%), followed by senior accountants (33%). Of these, 77% held bachelor in accounting, and 23% had masters in accounting. In addition, 14% of interviewees held a CPA qualification. In terms of experience, 46% of interviewees had long periods of work experience in their current firm (>5 years), 42% had medium experience (2–4 years), and 12% had an experience of one year. According to interviewees, our analysis shows 87% of our participants are between 22 to 29 years old, and 13% are 30 years and older. Finally, our sample includes 26% male interviewees, and 74% are female. Together, these statistics suggest that that our interviewees are sufficiently well-qualified and experienced to provide in-depth insights about the cryptocurrencies in accounting school. The study focuses on the Canadian market since the researchers had access to participants there. The principal researcher teaches at a Canadian institution with access to individuals and accounting programme expertise in Canada.

<INSERT TABLE 1 HERE>

Semi-structured interviews, guided by a set script, enabled us to explore cryptocurrency's fundamental positions among participants. This method conforms to various scholars' methods (Beasley et al., 2009). At least two study team members were present at each interview. Each interview lasted around 20 minutes, and all interviewees consented to be videotaped. Given the questions in the interview guide, interview responses were first categorised into topics and then into the survey's emerging themes. The experts reached a consensus on coded topics and themes through a series of iterations.

5. Results

Research Question 1

Accounting professors may have a wide range of experiences with cryptocurrencies and the blockchain technology. As the cryptocurrency industry continues to evolve, accounting professors will likely play an important role in developing accounting practices and standards that can help ensure the transparency and accuracy of cryptocurrency transactions (Ammous, 2018).

Our initial step in designing our interviews was to ascertain whether the professors had accounting competence. Because 62% of respondents could provide concrete examples of their professor's superior accounting knowledge, students typically display confidence when assessing their professor's accounting knowledge and experience. According to respondents, accounting lecturers are mostly CPA graduates who have worked in major accounting firms. These skills and experiences aided significantly in the explanation of the accounting topic. The following quotes demonstrate this "discovery" of accounting professors' job skills and background.

> *"I have a pretty professional faculty to learn from. They know about vast things. They were so easy to approach. I remember three of my accounting professors worked at KPMJ. I think that helped us to learn more and better". (P2)*

> *"My lecturers used to offer us significant examples from their past job experience and provide us with difficulties that required us to collaborate to determine a solution [for] customers. I honestly thought this to be very fascinating... I discovered that I probably want to get further knowledge in this area". (P24)*

> *"Now that I work as an accountant, I think, 'Oh. I completely get all of the instances my instructors illustrated in class, and their expertise has increased my confidence in reaching this point at my present company'". (P7)*

It is crucial to demonstrate that students can assess instructors' knowledge levels to ascertain whether they can judge their understanding of cryptocurrency. Participants were asked if accounting instructors were aware of cryptocurrency and whether they discussed cryptocurrencies. The overwhelming majority of our participants were dissatisfied that their accounting instructors never covered cryptocurrency in class, even though the vast expertise of their accounting professors had benefitted them in general. A few individuals acknowledged that instructors discussed cryptocurrencies but not accounting treatments or auditing cryptos. These views are conveyed in the following quotes.

> *"My instructors used to insist that we must live in the present. So, to live, individuals must learn new things. As a result, they spent time talking about cryptocurrencies but were never about financial treatment". (P15)*

> *"My professors are knowledgeable, but they have never really discussed such topics… I do not recall any of them ever mentioning bitcoins". (P8)*

> *"Cryptocurrency or bitcoin should be taught to students…. Regrettably, our lecturers never fully addressed such issues in class and the ones who did were against bitcoins". (P17)*

This result helps explain the varying knowledge and abilities of accounting professors. According to participants, they have a high degree of confidence in their capacity to determine the level of expertise of certain lecturers. The differences between accounting university graduates and college professors regarding their knowledge and skills are not substantial; this diversity of experience of accounting professors is consistent with prior studies (Bhaskar, 1983; Romney, 1983) and demonstrates the profession's willingness to hire academics with diverse skill sets. Most of the findings correctly recognised the academics' lack of knowledge about cryptocurrency, which as such may have contributed to these conclusions. Another probable explanation is that most accounting professors earned their degrees before cryptocurrencies were introduced, rendering them incapable of educating students.

Research Question 2

Barth et al. (2020) explored the impact of ethical and immoral conduct on the value of cryptocurrencies. Ethical concerns about their usage affect cryptocurrencies' value. In this study, we explored the ethical implications of cryptocurrencies to determine if professors avoid them because of ethical concerns and their belief systems. We learned that many participants' professors were concerned about cryptocurrencies and ethics, corresponding to an earlier study (Vincent & Wilkins, 2020). We inquired about the respondents' and their professors' perspectives on cryptocurrencies to evaluate whether they shared the same perspective.

According to most respondents, cryptocurrencies are primarily used for money laundering, illegal currency exchanges and platforms, and underground black markets. Expectedly, participants whose instructor was opposed to cryptocurrencies were hostile to cryptocurrency investments and transactions. In addition, our findings show that the concerns mentioned during the interview did not stop most accounting graduates from investing in cryptocurrencies. Due to a lack of awareness and ethical challenges, participants are learning more about crypto concerning accounting and audit procedures; they feel that cryptocurrencies will not vanish due to ethical concerns as more significant corporations invest in bitcoins. These views are conveyed in the following quotes.

> *"It is well known that drug dealers use cryptocurrencies". (P14)*
>
> *"There are so many issues surrounding bitcoin, take real states in Canada as an example, how international money is being used to legitimate the money". (P4)*
>
> *"I have many concerns about crypto…… drugs being the main reason". (P31)*
>
> *"I do think cryptocurrency is here to stay……. If governments issued their cryptocurrency in a few years, we would not see the mess in the market… and illegal activities will disappear". (P22)*
>
> *"I recall my professors talking about bitcoins and how drug dealers are using bitcoin… I feel it is better to be far away for now from bitcoin". (P27)*

Accordingly, our analysis results show a consistent with prior study, which found that the government and regulatory bodies are increasingly focusing on the ethical considerations of cryptocurrencies. Unethical conduct, such as market manipulation or fraudulent ICOs, can lead

to increased regulation and scrutiny, which can affect the valuation and adoption of cryptocurrencies (Bagus & De la Horra, 2021). In addition, ethics play a critical role in the adoption and valuation of cryptocurrencies. It is important for investors, companies, and regulators to promote ethical practices and hold those who engage in unethical conduct accountable (Dierksmeier & Seele, 2018). This can help build trust, protect the reputation of the industry, and ensure the long-term success of cryptocurrencies.

Research Question 3

Developing accounting books for cryptocurrencies can be a complex task, but it is important for individuals and companies that hold, trade, or mine cryptocurrencies to accurately track and report their cryptocurrency transactions. By doing so, they can comply with tax and regulatory requirements, and make informed decisions about their cryptocurrency holdings (Abayadeera et al., 2016). Therefore, as to whether accounting textbooks include cryptocurrencies, students had differing viewpoints. More than half of the respondents said that cryptocurrencies were never discussed in their books. These views are conveyed in the following quotes.

> *"I have never read anything about it in the previous version of books. Probably, the new versions may contain a little information on it". (P41)*

> *"I do not remember having encountered such a subject during my accounting studies in the books. I would remember if I saw it, given that I had reviewed my accounting books while preparing for my CPA". (P52)*

> *"I had never seen it, even when I was studying for my CPA. I went through all my CPA materials and CPA competencies books; I never had the opportunity to read about them… I firmly believed that no textbook stated anything about crypto". (P39)*

The remaining participants reported that the textbook devoted just one page to cryptography without providing examples or problems, or if it did, it did so unhelpfully. Students agree that the book's material on intangibles covers cryptocurrency, but, according to them, the handling of cryptocurrency in the book was insufficient for the subject since an increasing number of businesses embrace cryptocurrencies. These views are conveyed in the following quotes.

"I remember that my Intermediate Accounting volume 2 accounting textbook discussed cryptocurrency, but I think it was an introduction page, maybe in a one or two page only and was classified as intangible assets". (P30)

"Since I am investing in crypto, this caught my attention… I think there was one column in one of the chapters". (P9)

Respondents were able to offer precise justifications for their positions in answer to a subsequent inquiry. Their responses centred on crypto as a new problem, and future textbooks will need more resources to accommodate the growing number of crypto investors. Students cited the writers' lack of knowledge regarding cryptocurrency as a contributing factor. These views are conveyed in the following quotes.

"I do not believe the textbook included information about bitcoin, which is a new subject. It may take a few years before doing so". (P24)

"I think the book's author has no depth knowledge about crypto, so they did not expand on the subject……. Remember, it is a very new subject…., and people still test the water". (P29)

"I think if more people and companies invest in crypto, the more demand for information's needed. Which I believe will be in new editions of the accounting textbook". (P51)

This result indicates a dearth of information available in the textbook. Whether or not the interviewees stated that the cryptocurrency was discussed in the book, the fact remains that it was barely mentioned, indicating that students are incapable of addressing the accounting treatment of a cryptocurrency. This result contradicts prior research (Hammond et al., 2015). As a result of their examination of accounting textbooks, which revealed that accounting textbooks are being revised at an accelerating rate and that accounting professors believe the rate of change should be slowed, faculty members who are not textbook authors deem frequent textbook revisions to be of diminishing value.

Research Question 4

It is acknowledged that the range of duties of experienced accountants has expanded in recent years. Most accounting companies accept 'suitable' relevant job experience if a prospective member works under the guidance of a competent member in specific areas. Most universities and colleges in Canada provide an accounting co-op designed for students interested in acquiring work experience in accounting firms. Students in accounting must complete one semester working for a firm to be able to graduate from the programme. All participants completed the programme in their current or prior place of employment. Participants' reported that their work while in school was an entry-level role and that the training they obtained was relevant to their daily duties and understanding of the firm structures. Many in-hire positions reported that their training was only related to the new job and did not extend to other areas, such as cryptocurrencies. Few participants indicated that their firm has a specialist department and personnel who deal with cryptocurrency investment, yet they have no interaction due to the nature of their jobs. These views are conveyed in the following quotes.

> *"I have been investing in cryptocurrency since 2019. Thus, I have been acquainted with it. Nevertheless, I have never been trained at work about classifying crypto". (P11)*

> *"Last year, I started my job as an account receivable clerk; I have been reading much about it since my co-op was mainly about bookkeeping while I was at school……my firm does not deal with crypto; it is a small firm…… My supervisor invests in crypto; we sometimes discuss the crypto but not in terms of accounting classification auditing". (P26)*

> *"I was surprised when I learned that we have a specialist in crypto in our firms. Some of our companies invest in crypto……. But I rarely see or talk to the people who deal with crypto investors". (P31)*

> *"My work is not related to crypto, and. as a result, I have not been informed about it. Even though we have a large number of firms who invest in crypto……our database has information about crypto to read, but it's only accessible for people whose work relates to bitcoin". (P2)*

> *"Since I completed school, I have worked as an auditor at the government agency; so far, I did not have any clients who invested in crypto. Therefore, I never had training. I do not recall anyone at my workplace discussing the crypto… most of them believe it is a scam……but as we provide public service, I think we should know about crypto". (P27)*

Our results supported prior research that document that the graduate students may have a wide range of experiences with cryptocurrencies, depending on their interests and professional goals. Cryptocurrencies are a rapidly evolving field, and graduate students who engage with them may have the opportunity to gain valuable skills, develop new ideas, and make important contributions to the industry (Hasan et al., 2022).

6. Conclusion

Since cryptocurrency is a relatively new concept in accounting, laws are alarmingly absent. The challenges presented by the SEC in its quest to regulate cryptocurrencies and classify most of them as financial securities put pressure on the international standard to assess its definition of security through the lens of IFRS and offer a more accurate classification of cryptocurrency. While student investors are aware of the underlying principles of cryptocurrency, most graduates with accounting degrees continue to face difficulties due to a lack of knowledge about cryptocurrencies or a lack of resources.

Additionally, we discovered that recent accounting graduates have only the slightest awareness regarding cryptocurrencies, likely due to a lack of professors' comprehension or exposure to the issue. Our primary contribution is to understand if accounting graduates are prepared to do accounting and auditing work in the future regarding cryptocurrencies.

Some may argue that time is affecting the progress of cryptocurrencies more quickly than anybody anticipated. Although this may be true, cryptocurrencies have been on the market since 2011 and received substantial investment acceptance from companies in 2017. Since then, several textbooks have been revised and no longer include the appropriate section on cryptocurrencies. Another objection might be made about the instructors' expertise in cryptocurrencies since the subject was not featured in the textbook and was thus not discussed in class. This is a reasonable point; however, most participants report that they discuss cryptocurrencies with their professors and find either they are opposed to cryptocurrency for ethical reasons or have a limited

understanding of it. Several actions can be taken by schools in response to these findings, including collaboration with the CPA, regulators, and academic book authors to provide more resources about cryptocurrencies. Accounting schools should educate academics on cryptocurrencies and encourage instructors to include cryptocurrency-related content in their courses. Furthermore, we suggest that accounting textbooks should contain a section on cryptocurrencies. Students should learn about cryptocurrencies through CPA, Canada's cryptocurrency exams. In addition to developing criteria for evaluating whether cryptocurrencies qualify as securities, IFRS committees should comprehensively examine cryptocurrency classification.

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Vroeijenstijn, T. (2003). External quality assessment, servant of two masters? The Netherlands university perspective. In Quality assurance in higher education (pp. 119-144). Routledge.

Wells, P. K. (2018). How well do our introductory accounting text books reflect current accounting practice?. Journal of Accounting Education, 42, 40-48.

Table 1. Interviewees

Institution	Interviewee (Participant)	Position	Age	Gender	Academic qualification	Professional qualification	Years of firm experience
College 2	1	A	28	Female	BA		5
University 2	2	A	27	Female	BA		5
University 2	3	A	22	Male	BA		4
University 5	4	A	29	Female	BA		5
College 2	5	A	27	Female	BA		4
University 4	6	A	26	Female	BA		4
College 1	7	A	28	Female	BA		5
College 1	8	A	27	Female	BA		3
University 5	9	SA	33	Male	MA	CPA	5
College 2	10	A	24	Female	BA		4
University 3	11	A	27	Male	BA		3
University 3	12	SA	32	Female	MA	CPA	5
University 3	13	SA	24	Female	BA		2

College 1	14	A	28	Male	BA		5
University 4	15	A	27	Female	BA		3
College 1	16	A	29	Female	BA		5
University 1	17	A	24	Female	BA		2
University 1	18	A	23	Female	BA		1
University 5	19	A	29	Male	BA		5
College 2	20	SA	28	Female	BA		4
University 2	21	A	27	Female	BA		4
University 2	22	SA	29	Female	BA		5
College 1	23	SA	35	Male	MA	CPA	5
University 4	24	SA	29	Female	BA		5
University 3	25	A	24	Female	BA		2
College 1	26	A	26	Female	BA		3
University 5	27	A	22	Male	BA		1
University 3	28	A	28	Female	BA		4
College 1	29	SA	32	Female	MA	CPA	5
University 5	30	SA	27	Male	BA		5
University 1	31	SA	29	Female	MA		5
College 1	32	A	26	Female	BA		4
University 2	33	SA	31	Male	MA	CPA	5
University 4	34	A	29	Female	BA		5
College 1	35	A	26	Female	BA		3
University 1	36	SA	28	Female	MA		5
College 1	37	A	25	Male	BA		3
University 4	38	A	27	Female	BA		5
University 3	39	A	23	Female	BA		2
College 1	40	SA	27	Female	MA		5
University 1	41	SA	29	Female	MA		5
University 2	42	A	27	Female	BA		3
University 4	43	A	26	Male	BA		3
University 4	44	A	26	Female	BA		4
University 3	45	SA	27	Female	BA		5
University 1	46	A	23	Female	BA		1
University 3	47	A	28	Female	BA		5
University 3	48	SA	34	Male	MA	CPA	6
University 2	49	A	28	Female	BA		4
University 4	50	A	23	Female	MA		1
College 1	51	SA	29	Male	BA		5
University 5	52	A	28	Female	BA		4
University 3	53	SA	30	Male	MA	CPA	5
University 2	54	A	22	Female	BA		1
College 2	55	A	24	Female	BA		1
University 1	56	SA	29	Male	MA	CPA	8
University 2	57	A	27	Female	BA		3

Notes: SA – Senior Accountant, A – Accountant, MA – Master's in accounting, BA – Bachelor's in Accounting.

Responses to Reviewers Comments on "Cryptocurrencies in accounting school?"

I would like to thank the Editor and Reviewers for the care they have taken in reviewing my Manuscript and for their comments, which I feel have helped me enormously in revising the Manuscript. I am very happy that you are supportive my work. It has taken a proper time to rework, and I have tried, once again, to comprehensively address your comments.

< Reviewers comments are in italics below>

Reviewer (1) Comments and Justifications

<Kindly work the methodology part and results discussion.>

Amendment: This is very important comment. Both sections have been amended to meet the reviewer comment.

Affected Sections: Methodology and Results Sections.

Additional Questions:

<1. Originality: Does the paper contain new and significant information adequate to justify publication?: The study is novel and examines a very pertinent questions on need of crypto knowledge for students>

Thank you so much for your comment.

<2. Relationship to Literature: Does the paper demonstrate an adequate understanding of the relevant literature in the field and cite an appropriate range of literature sources? Is any significant work ignored?: There is lot of improvement needed to link the research questions to past literature. At the moment it looks more like a commentary paper instead of a full research article>

Amendment: Thank you for your great comment. This comment has been addressed based on the prior comment that related to the literature review.

Affected Sections: Literature Review Section.

<3. Methodology: Is the paper's argument built on an appropriate base of theory, concepts, or other ideas? Has the research or equivalent intellectual work on which the paper is based been well designed? Are the methods employed appropriate?: How exactly these research questions were formed needs to be justified. We don't see any statistical analysis being done>

Amendment: Thank you for your comment. This comment has been addressed by adding new explanation for interview statistics.

Affected Sections: Research Method Section.

<4. Results: Are results presented clearly and analysed appropriately? Do the conclusions adequately tie together the other elements of the paper?: The results are written quite casually and can only be considered valid when adequate statistical tool and robustness checks are shown. Currently there is very little information apart from percentages of respondent and their feedback.>

Amendment: Thank you for your valuable comment. This comment has been addressed by adding new table for interview statistics.

Affected Sections: Research Method Section.

<5. Implications for research, practice and/or society: Does the paper identify clearly any implications for research, practice and/or society? Does the paper bridge the gap between theory and practice? How can the research be used in practice (economic and commercial impact), in teaching, to influence public policy, in research (contributing to the body of knowledge)? What is the impact upon society (influencing public attitudes, affecting quality of life)? Are these implications consistent with the findings and conclusions of the paper?: The area is important, but the statistical and methodology needs significant improvement.>

Amendment: Thank you for this comment. This comment has been addressed according to the previous two comments 3 and 4. In addition, new implications paragraph added to the introduction section.

Affected Sections: Research Method and Introduction Sections.

<6. Quality of Communication: Does the paper clearly express its case, measured against the technical language of the field and the expected knowledge of the journal's readership? Has attention been paid to the clarity of expression and readability, such as sentence structure, jargon use, acronyms, etc.: There are quite a few typos and English can be checked by a native speaker.>

Amendment: Thank you for this comment. A proofreading completed for our article.

Affected Sections: Whole Sections.

<Do the title, keywords, abstract adequately reflect the paper's content? Readers will locate, and potentially cite, the article based on these words - they are crucial: Yes>

Thank you so much for your comment.

<If you have answered No, please provide feedback below and suggest alternative titles and keywords if appropriate.:

Do you feel the paper gives adequate international coverage (if appropriate)? Please provide details if possible.: Decent>

Thank you so much for your comment.

Would this paper be of interest to an international audience? Please provide details if possible: Yes

Thank you so much for your comment.

Reviewer (2) Comments and Justifications

<Review page 3, lines 25 to 27. I suggest use to use parenthetical citation at the end of the idea, after the acronym (IFRS).>

This comment has been addressed by adding a new reference. Thank you.

<Review page 9, lines 20 to 23. You need to improve the writing of this part to make ideas clear and more understandable.>

This comment has been addressed by rewriting the part that suggests being changed. Thank you.

Additional Questions:

<1. Originality: Does the paper contain new and significant information adequate to justify publication?: This paper contains new and significant information that accounting professors should consider to include in their curricula, in this way their students will know the pros and cons of topics they would face once in their professional lives.>

Thank you so much for your comment.

<2. Relationship to Literature: Does the paper demonstrate an adequate understanding of the relevant literature in the field and cite an appropriate range of literature sources? Is any significant work ignored?: This paper contains relevant literature review and a consideerable number of sources that support the topic in discussion.>

Thank you so much for your comment.

<3. Methodology: Is the paper's argument built on an appropriate base of theory, concepts, or other ideas? Has the research or equivalent intellectual work on which the paper is based been well designed? Are the methods employed appropriate?: The paper's argument contains theoretical support that makes it clear to understand the method applied for researching about this topic. The method includes a detailed explanation about the process followed to collect information and data about criptocurrency and bitcoins with quotes mentioned by both professors and students that help the reader to understand their position.>

Thank you so much for your comment.

<4. Results: Are results presented clearly and analysed appropriately? Do the conclusions adequately tie together the other elements of the paper?: The results are clear and have been properly analysed, the conclusions are tied to the main research questions of the paper.>

Thank you so much for your comment.

<5. Implications for research, practice and/or society: Does the paper identify clearly any implications for research, practice and/or society? Does the paper bridge the gap between theory and practice? How can the research be used in practice (economic and commercial impact), in teaching, to influence public policy, in research (contributing to the body of knowledge)? What is the impact upon society (influencing public attitudes, affecting quality of life)? Are these implications consistent with the findings and conclusions of the paper?: This paper relates theory with practice, the information here can help future accountants to be aware of this important topic which should be covered deeply in accounting classes, since it has impact in our society affecting many people who do not know in a deep way how it works.>

Thank you so much for your comment.

<6. Quality of Communication: Does the paper clearly express its case, measured against the technical language of the field and the expected knowledge of the journal's readership? Has attention been paid to the clarity of expression and readability, such as sentence structure, jargon use, acronyms, etc.: The paper has been well supported with technical terms that allow to better understand the topic, the languge is clear and can be easily understood, sentence structure is correct and meaning of acronyms used have been mentioned when first intorduced in the paper.>

Thank you so much for your comment.

<Do the title, keywords, abstract adequately reflect the paper's content? Readers will locate, and potentially cite, the article based on these words - they are crucial: Yes>

Thank you so much for your comment.

<If you have answered No, please provide feedback below and suggest alternative titles and keywords if appropriate.:

Do you feel the paper gives adequate international coverage (if appropriate)? Please provide details if possible.: Yes I do, as it covers a topic of interest for many people, I am sure there will be many people iwho would like to read information about this topic.>

Thank you so much for your comment.

<Would this paper be of interest to an international audience? Please provide details if possible: In my personal opinion this paper will be interesting for professors and students involved in the accounting and finantial fields; therefore, its contents will result attractive for them to take into consideration aspects that need to be covered in the curricula.>

Thank you so much for your comment.

Reviewer (3) Comments and Justifications

<Since accounting curriculums have limited space and are generally focused on more common, basic elements of accounting and financial reporting, a more suggestion that crypto needs to be added is not very impactful. However, developing the theoretical aspects of reporting crypto in financial statements along with current FASB and IASB rules on the subject would be very useful. The paper also has a number of grammatical and stylistic problems, so I recommend you have it professionally proof-read and edited before resubmitting.>

Amendment: Thank you for your comment. This comment has been addressed by adding a new section explaining cryptocurrency accounting and its theoretical framework and what the FASB and IFRS recommended. Ina addition, a proofreading has been completed for the paper.

Affected Sections: Literature Review Section and All paper sections.

Additional Questions:

<1. Originality: Does the paper contain new and significant information adequate to justify publication?: The information is new, however, the results are not especially significant since the premise is that cryptocurrency should be part of an undergraduate accounting curriculum. It would be good to survey academic curriculum design faculty to see if this topic should be included in depth in an accounting curriculum. As a topic, it fits more with finance unless accounting standard setting is discussed. However, the paper does not develop a new standard setting recommendation.>

Amendment: Thank you for your valuable comment. Accounting standards have been discussed concerning cryptocurrency.

Affected Sections: Literature Review Section.

<2. Relationship to Literature: Does the paper demonstrate an adequate understanding of the relevant literature in the field and cite an appropriate range of literature sources? Is any significant work ignored?: Good literature review.>

Thank you so much for your comment.

<3. Methodology: Is the paper's argument built on an appropriate base of theory, concepts, or other ideas? Has the research or equivalent intellectual work on which the paper is based been well designed? Are the methods employed appropriate?: The methods are appropriate for the questions posed by the researcher.>

Thank you so much for your comment.

<4. Results: Are results presented clearly and analysed appropriately? Do the conclusions adequately tie together the other elements of the paper?: The paper would be more impactful with a well developed theoretical arguement for accounting rulemaking.>

Amendment: Thank you for your valuable comment. We added a new argument to meet your comment.

Affected Sections: Literature Review Section, Research Method and Results Sections.

<5. Implications for research, practice and/or society: Does the paper identify clearly any implications for research, practice and/or society? Does the paper bridge the gap between theory and practice? How can the research be used in practice (economic and commercial impact), in teaching, to influence public policy, in research (contributing to the body of knowledge)? What is the impact upon society (influencing public attitudes, affecting quality of life)? Are these implications consistent with the findings and conclusions of the paper?: The implications of the research are limited to recommending more crypto- based education in an accounting curriculum. The theory and financial reporting discussion and recommendations were not well developed but deserve much more attention. I suggest the author add more theoretical development and financial reporting policy recommendations.>

Amendment: Thank you for your comment. This comment has been addressed by adding a new section explaining cryptocurrency accounting and its theoretical framework and what the FASB and IFRS recommended.

Affected Sections: Literature Review Section.

<6. Quality of Communication: Does the paper clearly express its case, measured against the technical language of the field and the expected knowledge of the journal's readership? Has attention been paid to the clarity of expression and readability, such as sentence structure, jargon use, acronyms, etc.: Some of the language and sentence structure suggests the writer is not a native English speaker. I recommend taking the paper to the university English writing lab for assistance before resubmitting.>

Amendment: Professional proofreading completed for the paper.

Affected Sections: All Sections.

<Do the title, keywords, abstract adequately reflect the paper's content? Readers will locate, and potentially cite, the article based on these words - they are crucial: Yes

If you have answered No, please provide feedback below and suggest alternative titles and keywords if appropriate.:>

Thank you so much for your comment.

<Do you feel the paper gives adequate international coverage (if appropriate)? Please provide details if possible.: Yes. The paper does discuss both US GAAP and IFRS, so it seems to be directed toward an international audience. However, it does not develop the theory for cryptocurrency accounting under either framework very well.

Would this paper be of interest to an international audience? Please provide details if possible: Yes. Cryptocurrency is an international phenomenon.>

Amendment: Thank you for your comment. This comment has been addressed by adding a new section explaining cryptocurrency accounting and its theoretical framework.

Affected Sections: Literature Review Section.

Associate Editor Comments and Justifications

This is an interesting paper and the feedback from the reviewers provides clear guidance of the amendments required.

Thank you so much for your great efforts in reviewing our paper and providing us with great and valuable comments to ensure that our article meets your journal requirements before publication (if accepted).

All reviewers' comments have been addressed.

Cryptocurrencies in Accounting Schools?

Abstract

Purpose – This study was conducted to determine whether new certified public accountants (CPAs) and accounting graduate students have a comprehensive understanding of cryptocurrencies and the skills they need over their years of education.

Design/methodology/approach – A qualitative analysis was used through semi-structured interviews to obtain an in-depth insight into cryptocurrencies, which could not be investigated easily through quantitative methods, and to provide an understanding of the context for cryptocurrencies from CPA and non-CPA students' points of view. This was in addition to focusing on understanding the differences between the students' thoughts.

Findings – This study found that recent accounting graduates and CPA members have the least awareness of cryptocurrencies, likely due to a lack of professors' comprehension or exposure to the concept. However, students involved in forensic courses provided more information about cryptocurrencies compared with other students.

Research limitations/implications – Our data are limited to only a single country. Given that cryptocurrencies are a relatively new notion in accounting, there is an alarming lack of legislation. Further, we found that recent accounting graduates and CPAs had the same level of knowledge of cryptocurrencies, most probably due to a lack of exposure during their education and academics' limited understanding of the concept.

Practical implications – The students' differing answers about cryptocurrencies show differences in their current level of understanding of cryptocurrencies.

Originality/value – This study has identified that the vast majority of accounting graduates lack adequate knowledge about cryptocurrencies or access to adequate resources, despite understanding the fundamental concepts of cryptocurrency.

Keywords: cryptocurrency; accounting graduates; education; knowledge; professors.

1. Introduction

In recent years, the emergence of new technology has transformed business procedures (Shaban, 2020). Experts have indicated that modern technology has considerably influenced the accounting profession (Al-Htaybat et al., 2018; Ferreira-Lopes et al., 2020). Integration is encouraged by the increasing significance of technology in the accounting and auditing professions. However, a fundamental understanding of the technological foundations of new technologies, such as cryptocurrencies, is needed (Phillip et al., 2018), as more companies begin to invest in cryptocurrencies, and investors are more interested than ever. The absence of meaningful formal guidance from generally accepted accounting procedures (GAAP) standards on cryptocurrencies is a substantial impediment for stakeholders (Yatsyk, 2018). This is an essential subject for both accountants and players in the market.

Cryptocurrency, which is categorized as an intangible asset under the current accounting standards (Vincent & Wilkins, 2020), has not received exceptional guidance from the International Financial Reporting Standards (IFRS). The Securities and Exchange Commission (SEC) maintains that several cryptocurrencies should be deemed securities (Hacker & Thomale, 2018); thus, businesses should classify them as financial instruments as opposed to intangible assets (Vincent & Wilkins, 2020). In "Holdings of Cryptocurrencies – June 2019" (Tsuji, 2020), the IFRS Committee determined that bitcoin holdings are not financial assets. Recently, CPA Canada published "Audit Considerations Related to Cryptocurrency Assets and Transactions," which included the mention of intangible assets.

Cryptocurrencies can have various implications for graduate accounting students, both as investors and as participants in the cryptocurrency industry. Cryptocurrencies can offer graduate students new investment opportunities, either as a speculative investment or as a long-term investment in the future of blockchain technology. In addition, cryptocurrencies can offer graduate students new opportunities for investment, research, job seeking, and entrepreneurship. However, graduate students should carefully evaluate the risks and benefits of investing in cryptocurrencies, as the market can be highly volatile and subject to market manipulation. As investors or participants, students should carefully evaluate the risks and benefits of engaging with the cryptocurrency industry and should be prepared to adapt to the rapid changes and uncertainties that are characteristic of the industry.

This study aims to determine whether accounting students have been introduced to cryptocurrencies and their handling during their education. We surveyed current students and recent graduates of accounting about their experiences learning about cryptocurrency in their accounting programs. Recent graduate students with accounting degrees and certifications were tested regarding their understanding of cryptocurrencies.

According to our findings, most students' core curricula do not provide a comprehensive discussion of cryptocurrencies. Instead, cryptocurrencies are introduced only as immaterial assets that must be reported in financial statements, and students are not instructed on auditing or assessing cryptocurrencies. Most students agreed that their professors' lack of cryptocurrency understanding is evident. These results demonstrate that the quality of accounting graduates is hampered by an imbalanced relationship between academics and technological progress. One of the most influential studies (Qasim & Kharbat, 2020) presented the integrated technique for revamping courses at three levels (introductory, intermediate, and advanced) and technologies. We also found that participants were concerned about cryptocurrencies and illegal activities.

This study's primary contribution is its revealing the critical need for a prototype and more regulations from the IFRS covering cryptocurrency categories and data for auditors and accountants to comprehend the issues posed by cryptocurrencies (Ramassa & Leoni, 2022), similar to the Financial Accounting Standards Board (FASB), which issued a new handout for accounting for exchange-traded digital assets in May 2022.

2. Literature Review

Blockchain, DLT, and decentralized

Cryptocurrencies, such as bitcoin, rely on blockchain technology (Shaban, 2020). As the name suggests, blockchains are newer forms of distributed ledger technology (DLT) consisting of a database that keeps transaction data in ledgers in the form of distributed blocks. A block is a periodic ledger or container of data in computing. Each successive block contains the address of the previous block; a chain of cryptographically linked transaction bundles, or blocks, results from each block referencing the previous block (Perlman, 2019). A blockchain is a technique used by a community of users to maintain a shared transaction record. The community verifies each transaction through a consensus method, and verified transactions are consequently recorded in the ledger of a blockchain network (Perlman, 2019; Rahman & Ali, 2020).

DLT resolves difficulties relating to innovation or technology with shared and regulated data and the secure administration of diverse commercial transactions by numerous organizations (Sultan et al., 2018). The system relies on modern cryptographic proofs for distributed authentication in the DLT. Data are stored in DLT blocks, continuously added, and synced between participating nodes in particular networks (Perdana et al., 2021). However, governments and regulatory organizations prefer DLT to blockchains. A decentralized peer-to-peer network is used to conduct cryptocurrency transactions, obviating the requirement for a central authority (Adams & Bailey, 2021; Kostić & Sedej, 2022; Nabilou, 2019; Vincent & Wilkins, 2020). In summary, blockchains are a type of DLT that is decentralized, and decentralization is a key aspect of both blockchain and DLT technologies. DLT is a broader term that encompasses all types of decentralized and distributed ledger technologies, including blockchains.

Cryptocurrencies Under IFRS: Are They Intangible Assets?

Accounting standards do not yet exist for various challenges that accountants may encounter in practice. One such concern is cryptocurrencies. Due to the lack of an accounting standard defining how cryptocurrencies should be accounted for, accountants are compelled to use established accounting standards (Vincent & Wilkins, 2020). However, cryptocurrency holders do not usually possess this type of contractual right. Thus, cryptocurrencies do not appear to fit the definition of a non-cash financial asset in IAS 32 and IFRS 9 (Barker & Teixeira, 2018).

The classification of cryptocurrencies under IFRS is a matter of debate and interpretation. Currently, there is no specific guidance on how to classify cryptocurrencies under the IFRS. However, it is generally considered that cryptocurrencies may be classified as intangible assets under IFRS if they meet the definition of an intangible asset, as stated in IFRS 38. According to IFRS 38, an intangible asset is an identifiable non-monetary asset without physical substance. To meet this definition, a cryptocurrency would need to have specific attributes, such as an identifiable and distinct set of rights and obligations, the ability to generate future economic benefits, and the ability to be sold, transferred, or exchanged (Chou et al., 2022). Therefore, if a cryptocurrency meets the definition of an intangible asset, it would be recorded as an intangible asset on the company's balance sheet, with any changes in its fair value being recognized in the company's income statement.

To summarize, it is important to note that the classification of cryptocurrencies as intangible assets under the IFRS is still subject to interpretation and may differ in different jurisdictions.

Companies and their auditors should exercise judgment and carefully consider the specific facts and circumstances in each case to determine the most appropriate classification under the IFRS.

Cryptocurrencies Under the SEC: Are They Securities?

Cryptocurrency and initial coin offerings are booming. The scope of these markets includes regional, national, and international players and an increasingly diverse spectrum of products and services. Investors and other market participants can face issues because of these developments. In such a market, U.S. federal law regulates investment companies and their operations and establishes industry standards. President Franklin D. Roosevelt signed the Investment Advisers Act of 1940 (Moriarty, 2021), empowering the SEC to oversee investment trusts and counselors. The SEC is comprised of four divisions, and several divisions within it work toward the same goal of protecting investors, ensuring fair, organized, and efficient markets, and promoting the interests of investors (Jorgensen et al., 2007).

However, while the SEC has not issued a definitive ruling on whether all cryptocurrencies are securities, in its guidance, it has stated that many cryptocurrencies may be considered securities and, therefore, subject to federal securities laws (Quamara & Singh, 2022). The SEC applies the Howey test, a court-created test, to determine whether a particular investment is a security. According to the Howey test, an investment is a security if it involves an investment of money in a common enterprise, with the expectation of profits predominantly from the efforts of others. Based on this definition, the SEC has indicated that many initial coin offerings (ICOs) and other cryptocurrency offerings may be considered securities offerings, and, therefore, subject to federal securities laws. For example, if a cryptocurrency is marketed as an investment opportunity and promises a return on investment, the SEC may view it as security (DiMarino & Roberson, 2013; Hacker & Thomale, 2018).

Lastly, it is essential to note that the classification of cryptocurrencies as securities is a fact-specific determination and may vary depending on the specific facts and circumstances of each case. Companies and individuals involved in cryptocurrency offerings should carefully consider the applicable laws and regulations, and consult with legal counsel to determine the appropriate regulatory treatment of their offerings.

Cryptocurrency in School Accounting Books

Accounting rules emphasize responsibility in preparing financial reports to reduce unethical conduct that might endanger stakeholders' assets. Experts have concluded that ethical and responsible behavior in generating financial reports begins in the classroom. Therefore, vital accounting education is necessary to improve the compilation of financial reports. According to Suryawathy and Putra (2016), chief financial officers (CFOs) are worried about the quality of accounting education. Abayadeera et al. (2016) informed stakeholders of the significance of accounting skills for graduates. When accounting instructors can effectively convey information (Suryawathy & Putra, 2016) in a conducive learning environment, these abilities are provided (CPA Canada, 2018; Vroeijenstijn, 2003).

Furthermore, the globalization and development of accounting, such as IFRS, affects accounting education (Needles Jr, 2010), increasing CFOs' demand for improved accountant skills (Mathews, 2001). These demands and rapid changes are fundamental requirements in the educational quality environment. In addition, most accounting books classify cryptocurrencies as intangible assets (Martin et al., 2020); the possibility that cryptocurrencies could be classified differently is not discussed.

Cryptocurrency Accounting and Theoretical Framework

Cryptocurrency accounting and framework theories are still evolving, as the use of cryptocurrencies and their underlying blockchain technology is relatively new. However, several theoretical frameworks have been proposed to help accountants and financial professionals understand how to approach accounting for cryptocurrencies and related transactions. One of the frameworks is based on the concept of "real options," which considers the potential future value of a cryptocurrency investment and how that value can be realized (Sumarti et al., 2021). This framework considers the uncertainty of cryptocurrency prices and the ability of investors to make decisions based on that uncertainty. Another framework is based on the "information economics" perspective, which views cryptocurrencies as a source of information about the state of the underlying blockchain network (Caferra, 2022; Marthinsen & Gordon, 2021). In terms of actual accounting for cryptocurrencies, there are currently no globally accepted standards for how to account for cryptocurrencies in financial statements. However, some guidance has been provided by organizations such as the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB), which have issued information on how to account for cryptocurrencies in general-purpose financial statements.

Thus, although there is still much work to be done to fully understand the implications of cryptocurrency accounting, the existing frameworks and guidance can provide a starting point for accountants and financial professionals as they work to develop a comprehensive approach to accounting for cryptocurrencies.

3. Research Questions

From the standpoint of students, we seek to gain a greater understanding of whether educators have the necessary expertise in cryptocurrency technology through the following research questions:

RQ1: How do accounting professors introduce, explain, and debate cryptocurrencies during the academic years?

Our study focused on explaining how cryptocurrencies in accounting classes might vary, depending on the instructor's personal views and the specific course being taught. However, some common ways accounting professors may introduce, explain, and debate cryptocurrencies in their classes include beginning by explaining what cryptocurrencies are and how they function, including their underlying technology, such as blockchains, and how they differ from traditional fiat currencies. Accounting professors may then explain the accounting implications of cryptocurrencies, such as the challenges in valuation, the need for proper disclosures, and the potential impact on financial statements, as well as the regulations, which should be discussed to show the current regulatory landscape for cryptocurrencies, including the varying approaches taken by different countries, and the implications for companies and investors (Ammous, 2018; Lawson et al., 2014; Showalter & Wilks, 2021).

RQ2: During the academic years, do accounting professors debate the ethical concerns of cryptocurrencies?

As accounting and accountants evolve, they are affected by various factors, including the context within which they operate and the technological advances that affect their capture (Wells, 2018). The curriculum for accounting education is often criticized for needing to represent contemporary accounting practices fully. This can be due to a variety of reasons, including the slow pace of change, emphasis on traditional accounting methods, lack of industry involvement, lack of practical experience, and the fact that accounting education often lacks opportunities for students

to gain valuable experience in real-world accounting scenarios, which can limit their exposure to contemporary accounting practices (Parker et al., 2011; Mathews, 2001). Accordingly, we propose the following research question:

RQ3: Do accounting textbooks used during school years explain cryptocurrency in detail?

Cryptocurrencies are a relatively new development, and their impact on the accounting profession is still evolving. Some accounting textbooks briefly mention cryptocurrencies, and most textbooks generally do not cover the topic in depth. Instead, accounting professors may supplement their courses with additional readings, case studies, and other materials to provide students with a more comprehensive understanding of this emerging area (e.g., Abayadeera et al., 2016; Suryawathy & Putra, 2016; Vroeijenstijn, 2003). It is likely that, as the use and impact of cryptocurrencies continue to grow, they will receive more attention in accounting textbooks and courses in the future. This means that firms may examine new employees' competencies to identify development needs. Despite the increased interest in this area, no studies have examined development programs for accountants on cryptocurrency. Consequently, we propose our final research question:

RQ4: Do accounting firms provide on-the-job training on cryptocurrency?

Recently, many accounting firms have begun to provide training on cryptocurrency to their employees. As the use of cryptocurrencies becomes more widespread, accounting firms are recognising the importance of having a knowledgeable workforce that understands the accounting implications of these emerging technologies (Stern & Reinstein, 2021). The nature and extent of cryptocurrency training provided by accounting firms can, however, vary widely, ranging from brief overviews to comprehensive courses. Some firms may offer in-house training sessions or workshops, while others may provide online courses or other training materials. The training may focus on a range of topics, including the basics of cryptocurrencies, the implications of accounting and financial reporting, and the regulatory landscape. Overall, providing training on cryptocurrency is becoming increasingly important for accounting firms as the use of these technologies continues to grow, and it is likely that this trend will continue in the future.

4. Research Method

This study examines the knowledge, experiences, and perceived outcomes of students who have completed CPA studies and recent graduates who enroll in a CPA program. To investigate our research question, we conducted semi-structured interviews. These semi-structured interviews offer precise information on individual real-world students' experiences with cryptocurrencies, allowing us to better understand how they acquire crypto knowledge. A virtual interview process was conducted with 57 recently qualified accountants. To ensure diversity across universities and colleges in Canada, we identified interviewees through our contacts. One coauthor conducted a thorough question-by-question analysis in keeping with the study's interpretive focus (Hermanson et al., 2012). This coauthor classified and categorized replies by their frequency of occurrence; the coauthor conferred with the other coauthors as needed. A second coauthor evaluated the data file and chose quotes from the interviews to prepare the manuscript. Along with the initial coauthor, two more coauthors analyzed the patterns of the results and quoted discussions for consistency with their perceptions. This study used Han's (2015) quoting method to present the results.

All participants had received their credentials within the last five years. We estimated that government entities employ 35% of the population. Two-fifths (40%) are employed by major companies, whereas small companies employ 27%. Three-quarters (73%) of the participants invested in cryptocurrencies, although none analyzed them in their jobs. Just over a third (35%) started to invest in cryptocurrencies while at school, the majority in 2019. All participants had to provide a copy of their degree certificates in accounting for reliability. We apply a two-phase strategy to evaluate recent graduates' understanding of cryptocurrency and how they acquire this information. In the first phase, we constructed an interview protocol and executed semi-structured interviews.

4.1. Semi-Structured Interviews

Overall, semi-structured interviews can be a valuable tool for studying cryptocurrencies because they allow researchers to collect rich, detailed data on participants' experiences, perspectives, and behaviors (Obreja, 2022). We conducted interviews with 57 recent accounting graduates. We randomly selected the sample from five public universities and two public colleges enrolled in the CPA Canada program that participated in the interviews in 2021.

Table 1 summarizes the characteristics of the interviewees, including education, qualifications, age, gender, and experience. As shown, most of our interviews were with accountants (67%), followed by senior accountants (33%). Of these, 77% had a bachelor's degree in accounting, and 23% had a master's degree in accounting. In addition, 14% of interviewees had CPA qualifications. In terms of experience, 46% of interviewees had long periods of work experience in their current firm (>5 years), 42% had medium experience (2–4 years), and 12% had an experience of one year. Our analysis showed that 87% of our participants were between 22 and 29 years old, and 13% were 30 years and older. Our sample included 26% male and 74% female interviewees. Together, these statistics suggest that our interviewees were sufficiently well-qualified and experienced to provide in-depth insights about cryptocurrencies in accounting schools. The study focuses on the Canadian market, since the researchers had access to participants there. The principal researcher teaches at a Canadian institution with access to individuals and accounting program expertise in Canada.

<INSERT TABLE 1 HERE>

Semi-structured interviews, guided by a set script, enabled us to explore the fundamental positions of cryptocurrency among the participants. This method conforms to the methods of various scholars' methods (Beasley et al., 2009). At least two study team members were present at each interview. Each interview lasted around 20 minutes, and all interviewees consented to be videotaped. Based on the questions in the interview guide, the interview responses were initially categorized into topics and then into emerging themes. The experts reached a consensus on coded topics and themes through a series of iterations.

5. Results

Research Question 1

Accounting professors may have a wide range of experience with cryptocurrencies and blockchain technology. As the cryptocurrency industry continues to evolve, accounting professors will likely play an important role in developing accounting practices and standards that can help ensure the transparency and accuracy of cryptocurrency transactions (Ammous, 2018).

Our initial step in designing our interviews was to ascertain whether the professors had accounting competence. Overall, 62% of respondents provided concrete examples of their professor's superior accounting knowledge, indicating students' confidence in assessing their professor's

accounting knowledge and experience. According to the respondents, accounting lecturers were mostly CPA graduates who worked in major accounting firms. These skills and experiences aided significantly in explaining the accounting topic. The following quotes demonstrate this "discovery" of accounting professors' job skills and backgrounds.

> *"I have a pretty professional faculty to learn from. They know about vast things. They were so easy to approach. I remember three of my accounting professors worked at KPMJ. I think that helped us learn more and better." (P2)*

> *"My lecturers used to offer us significant examples from their past job experience and provide us with difficulties that required us to collaborate to determine a solution [for] customers. I honestly thought this to be very fascinating ... I discovered that I probably want to get further knowledge in this area." (P24)*

> *"Now that I work as an accountant, I think, 'Oh. I completely get all of the instances my instructors illustrated in class, and their expertise has increased my confidence in reaching this point at my present company'". (P7)*

It is crucial to demonstrate that students can assess instructors' knowledge levels to ascertain whether they can judge their understanding of cryptocurrency. The overwhelming majority of our participants were dissatisfied that their accounting instructors had never covered cryptocurrency in class, even though the vast expertise of their accounting professors had benefitted them in general. A few individuals acknowledged that instructors discussed cryptocurrencies but not accounting treatments or auditing cryptos. These views are conveyed in the following quotes:

> *"My instructors used to insist that we must live in the present. So, to live, individuals must learn new things. As a result, they spent time talking about cryptocurrencies but were never about financial treatment". (P15)*

> *"My professors are knowledgeable, but they have never really discussed such topics... I do not recall any of them ever mentioning bitcoins." (P8)*

> *"Cryptocurrency or bitcoin should be taught to students ... Regrettably, our lecturers never fully addressed such issues in class, and the ones who did were against bitcoins." (P17)*

These quotes highlight the variation in the knowledge and abilities of accounting professors. According to the participants, they had a high degree of confidence in their capacity to determine the level of expertise of certain lecturers. The differences between accounting university graduates and college professors regarding their knowledge and skills were not substantial. This diversity of experience of accounting professors is consistent with prior studies (Bhaskar, 1983; Romney, 1983) and demonstrates the profession's willingness to hire academics with diverse skill sets. Another probable explanation is that most accounting professors earned their degrees before cryptocurrencies were introduced, rendering them incapable of educating students.

Research Question 2

Our analysis showed that many participants' professors were concerned about cryptocurrencies and ethics, corresponding to an earlier study (Barth et al., 2020; Vincent & Wilkins, 2020). We inquired about the respondents' and their professors' perspectives on cryptocurrencies to evaluate whether they shared the same perspective. According to most respondents, cryptocurrencies were primarily used for money laundering, illegal currency exchanges and platforms, and underground black markets. As expected, participants whose instructor was opposed to cryptocurrencies were hostile to cryptocurrency investments and transactions. In addition, our findings show that the concerns mentioned during the interview did not stop most accounting graduates from investing in cryptocurrencies. Due to a lack of awareness and ethical challenges, participants were learning more about crypto concerning accounting and audit procedures; they felt that cryptocurrencies would not vanish due to ethical concerns, and as more significant corporations invest in bitcoins. These views are conveyed in the following quotes:

> *"It is well known that drug dealers use cryptocurrencies." (P14)*
>
> *"There are so many issues surrounding bitcoin, take real states in Canada as an example, how international money is being used to legitimate the money". (P4)*
>
> *"I have many concerns about crypto…… drugs being the main reason." (P31)*
>
> *"I do think cryptocurrency is here to stay … If governments issued their cryptocurrency in a few years, we would not see the mess in the market… and illegal activities will disappear." (P22)*

> *"I recall my professors talking about bitcoins and how drug dealers are using bitcoin… I feel it is better to be far away for now from bitcoin." (P27)*

Accordingly, our analysis results are consistent with prior studies, which found that government and regulatory bodies are increasingly focusing on the ethical considerations of cryptocurrencies. Unethical conduct, such as market manipulation or fraudulent ICOs, can lead to increased regulation and scrutiny, which can affect the valuation and adoption of cryptocurrencies (Bagus & De la Horra, 2021). In addition, ethics play a critical role in the adoption and valuation of cryptocurrencies. It is important for investors, companies, and regulators to promote ethical practices and hold those who engage in unethical conduct accountable (Dierksmeier & Seele, 2018). This can help build trust, protect the reputation of the industry, and ensure the long-term success of cryptocurrencies.

Research Question 3

Developing accounting books for cryptocurrencies can be a complex task, but it is important for individuals and companies that hold, trade, or mine cryptocurrencies to accurately track and report their cryptocurrency transactions. By doing so, they can comply with tax and regulatory requirements, and make informed decisions about their cryptocurrency holdings (Abayadeera et al., 2016). Therefore, regarding whether accounting textbooks include cryptocurrencies, the students had differing viewpoints. More than half of the respondents said that cryptocurrencies were never discussed in their textbooks. These views are conveyed in the following quotes:

> *"I have never read anything about it in the previous version of books. Probably, the new versions may contain a little information on it." (P41)*

> *"I do not remember having encountered such a subject during my accounting studies in the books. I would remember if I saw it, given that I had reviewed my accounting books while preparing for my CPA." (P52)*

> *"I had never seen it, even when I was studying for my CPA. I went through all my CPA materials and CPA competencies books; I never had the opportunity to read about them… I firmly believed that no textbook stated anything about crypto." (P39)*

The remaining participants reported that the textbook devoted just one page to cryptography without providing examples or problems, or if they did, the examples were not helpful. Students agreed that the textbook's material on intangibles covered cryptocurrency, but according to them, the handling of cryptocurrency in the book was insufficient for the subject, since an increasing number of businesses were embracing cryptocurrencies. These views are conveyed in the following quotes:

> *"I remember that my Intermediate Accounting volume 2 accounting textbook discussed cryptocurrency, but I think it was an introduction page, maybe in a one or two page only and was classified as intangible assets". (P30)*

> *"Since I am investing in crypto, this caught my attention… I think there was one column in one of the chapters." (P9)*

The respondents were able to offer precise justifications for their positions in response to a subsequent inquiry. Their responses centered on crypto as a new problem, indicating that future textbooks would need more resources to accommodate the growing number of crypto investors. Students cited the writers' lack of knowledge regarding cryptocurrency as a contributing factor. These views are conveyed in the following quotes:

> *"I do not believe the textbook included information about bitcoin, which is a new subject. It may take a few years before doing so." (P24)*

> *"I think the book's author has no in-depth knowledge about crypto, so they did not expand on the subject … Remember, it is a very new subject …, and people still test the water." (P29)*

> *"I think if more people and companies invest in crypto, the more demand for information's needed. Which I believe will be in new editions of the accounting textbook". (P51)*

This result indicates a dearth of information available in the textbooks. Whether or not the interviewees stated that the cryptocurrency was discussed in the book, the fact remains that it was barely mentioned, indicating that students are incapable of addressing the accounting treatment of a cryptocurrency. This result contradicts prior studies (Hammond et al., 2015). As a result of their examination of accounting textbooks, which revealed that accounting textbooks are being

revised at an accelerating rate and that accounting professors believe the rate of change should be slowed, faculty members who are not textbook authors deem frequent textbook revisions to be of diminishing value.

Research Question 4

Most universities and colleges in Canada provide an accounting co-op designed for students interested in acquiring work experience in accounting firms. Students in accounting must complete one semester of working for a firm to be able to graduate from the program. All participants completed the program in their current or prior place of employment. Participants reported that their work while in school was an entry-level role, and that the training they obtained was relevant to their daily duties and understanding of the firm structures. Many in-hire positions reported that their training was only related to the new job and did not extend to other areas, such as cryptocurrencies. A few participants indicated that their firm had specialist departments and personnel who dealt with cryptocurrency investment, yet they had no interaction due to the nature of their jobs. These views are conveyed in the following quotes:

> *"I have been investing in cryptocurrency since 2019. Thus, I have become acquainted with it. Nevertheless, I have never been trained at work about classifying crypto." (P11)*

> *"Last year, I started my job as an account receivable clerk. I have been reading much about it since my co-op was mainly about bookkeeping while I was at school … my firm does not deal with crypto; it is a small firm … My supervisor invests in crypto. We sometimes discuss the crypto but not in terms of accounting classification auditing". (P26)*

> *"I was surprised when I learned that we have a specialist in crypto in our firms. Some of our companies invest in crypto … But I rarely see or talk to the people who deal with crypto investors." (P31)*

> *"My work is not related to crypto, and as a result, I have not been informed about it. Even though we have a large number of firms who invest in crypto … our database has information about crypto to read, but it's only accessible for people whose work relates to bitcoin." (P2)*

> *"Since I completed school, I have worked as an auditor at the government agency; so far, I did not have any clients who invested in crypto. Therefore, I never had training. I do not recall anyone at my workplace discussing the crypto … most of them believe it is a scam……but as we provide public service, I think we should know about crypto." (P27)*

Our results supported prior research that documented that graduate students may have a wide range of experiences with cryptocurrencies, depending on their interests and professional goals. Cryptocurrencies are a rapidly evolving field, and graduate students who engage with them may have the opportunity to gain valuable skills, develop new ideas, and make important contributions to the industry (Hasan et al., 2022).

6. Conclusion

Since cryptocurrency is a relatively new concept in accounting, laws are alarmingly absent. The challenges presented by the SEC in its quest to regulate cryptocurrencies and classify most of them as financial securities put pressure on the international standard to assess its definition of security through the lens of IFRS and offer a more accurate classification of cryptocurrency. Whereas student investors are aware of the underlying principles of cryptocurrency, most graduates with accounting degrees continue to face difficulties due to a lack of knowledge about cryptocurrencies or a lack of resources. We also discovered that recent accounting graduates had only the slightest awareness of cryptocurrencies, likely due to a lack of professors' comprehension of or exposure to the issue. Our primary contribution is to understand whether accounting graduates are prepared to conduct accounting and auditing work regarding cryptocurrencies in the future.

Our analysis showed that several textbooks have been revised and no longer included the appropriate section on cryptocurrencies. Another objection might be made about the instructors' expertise in cryptocurrencies, since the subject was not featured in the textbook and was thus not discussed in class. This is a reasonable point; however, most participants reported that they discussed cryptocurrencies with their professors and either opposed cryptocurrency for ethical reasons or had a limited understanding of it. Several actions can be taken by schools in response to these findings, including collaboration with the CPA, regulators, and academic book authors to provide more resources about cryptocurrencies. Accounting schools should educate academics on cryptocurrencies and encourage instructors to include cryptocurrency-related content in their

courses. Furthermore, we suggest that accounting textbooks should contain a section on cryptocurrencies. Students should learn about cryptocurrencies through CPA and Canada's cryptocurrency exams. In addition to developing criteria for evaluating whether cryptocurrencies qualify as securities, IFRS committees should comprehensively examine cryptocurrency classification.

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Table 1. Interviewees

Institution	Interviewee (Participant)	Position	Age	Gender	Academic qualification	Professional qualification	Years of firm experience
College 2	1	A	28	Female	BA		5
University 2	2	A	27	Female	BA		5
University 2	3	A	22	Male	BA		4
University 5	4	A	29	Female	BA		5
College 2	5	A	27	Female	BA		4
University 4	6	A	26	Female	BA		4
College 1	7	A	28	Female	BA		5
College 1	8	A	27	Female	BA		3
University 5	9	SA	33	Male	MA	CPA	5
College 2	10	A	24	Female	BA		4
University 3	11	A	27	Male	BA		3
University 3	12	SA	32	Female	MA	CPA	5
University 3	13	SA	24	Female	BA		2
College 1	14	A	28	Male	BA		5
University 4	15	A	27	Female	BA		3
College 1	16	A	29	Female	BA		5
University 1	17	A	24	Female	BA		2
University 1	18	A	23	Female	BA		1
University 5	19	A	29	Male	BA		5
College 2	20	SA	28	Female	BA		4
University 2	21	A	27	Female	BA		4
University 2	22	SA	29	Female	BA		5
College 1	23	SA	35	Male	MA	CPA	5
University 4	24	SA	29	Female	BA		5
University 3	25	A	24	Female	BA		2
College 1	26	A	26	Female	BA		3
University 5	27	A	22	Male	BA		1
University 3	28	A	28	Female	BA		4
College 1	29	SA	32	Female	MA	CPA	5
University 5	30	SA	27	Male	BA		5
University 1	31	SA	29	Female	MA		5
College 1	32	A	26	Female	BA		4
University 2	33	SA	31	Male	MA	CPA	5
University 4	34	A	29	Female	BA		5

College 1	35	A	26	Female	BA		3
University 1	36	SA	28	Female	MA		5
College 1	37	A	25	Male	BA		3
University 4	38	A	27	Female	BA		5
University 3	39	A	23	Female	BA		2
College 1	40	SA	27	Female	MA		5
University 1	41	SA	29	Female	MA		5
University 2	42	A	27	Female	BA		3
University 4	43	A	26	Male	BA		3
University 4	44	A	26	Female	BA		4
University 3	45	SA	27	Female	BA		5
University 1	46	A	23	Female	BA		1
University 3	47	A	28	Female	BA		5
University 3	48	SA	34	Male	MA	CPA	6
University 2	49	A	28	Female	BA		4
University 4	50	A	23	Female	MA		1
College 1	51	SA	29	Male	BA		5
University 5	52	A	28	Female	BA		4
University 3	53	SA	30	Male	MA	CPA	5
University 2	54	A	22	Female	BA		1
College 2	55	A	24	Female	BA		1
University 1	56	SA	29	Male	MA	CPA	8
University 2	57	A	27	Female	BA		3

Notes: SA – Senior Accountant, A – Accountant, MA – Master's in accounting, BA – Bachelor's in Accounting.

Cryptocurrencies in Accounting Schools?

Abstract

Purpose – This study aims to investigate the extent to which newly certified public accountants (CPAs) and accounting graduate students possess a comprehensive understanding of cryptocurrencies and the skills they have acquired throughout their education.

Design/methodology/approach – A qualitative analysis was used through semi-structured interviews to obtain an in-depth insight into cryptocurrencies, which could not be investigated easily through quantitative methods, and to provide an understanding of the context for cryptocurrencies from CPA and non-CPA students' points of view. This was in addition to focusing on understanding the differences between the students' thoughts.

Findings – This study found that recent accounting graduates and CPA members have the least awareness of cryptocurrencies, likely due to a lack of professors' comprehension or exposure to the concept. However, students involved in forensic courses provided more information about cryptocurrencies compared with other students.

Research limitations/implications – Our data are limited to only a single country. Given that cryptocurrencies are a relatively new notion in accounting, there is an alarming lack of legislation. Further, we found that recent accounting graduates and CPAs had the same level of knowledge of cryptocurrencies, most probably due to a lack of exposure during their education and academics' limited understanding of the concept.

Practical implications – The students' differing answers about cryptocurrencies show differences in their current level of understanding of cryptocurrencies.

Originality/value – This study has identified that the vast majority of accounting graduates lack adequate knowledge about cryptocurrencies or access to adequate resources, despite understanding the fundamental concepts of cryptocurrency.

Keywords: cryptocurrency; accounting graduates; education; knowledge; professors.

1. Introduction

In recent years, the emergence of new technology has transformed business procedures (Shaban, 2020). Experts have indicated that modern technology has considerably influenced the accounting profession (Al-Htaybat et al., 2018; Ferreira-Lopes et al., 2020). Integration is encouraged by the increasing significance of technology in the accounting and auditing professions. However, a fundamental understanding of the technological foundations of new technologies, such as cryptocurrencies, is needed (Phillip et al., 2018), as more companies begin to invest in cryptocurrencies, and investors are more interested than ever. The absence of meaningful formal guidance from generally accepted accounting procedures (GAAP) standards on cryptocurrencies is a substantial impediment for stakeholders (Yatsyk, 2018). This is an essential subject for both accountants and players in the market.

Cryptocurrency, which is categorized as an intangible asset under the current accounting standards (Vincent & Wilkins, 2020), has not received exceptional guidance from the International Financial Reporting Standards (IFRS). The Securities and Exchange Commission (SEC) maintains that several cryptocurrencies should be deemed securities (Hacker & Thomale, 2018); thus, businesses should classify them as financial instruments as opposed to intangible assets (Vincent & Wilkins, 2020). In "Holdings of Cryptocurrencies – June 2019" (Tsuji, 2020), the IFRS Committee determined that bitcoin holdings are not financial assets. Recently, CPA Canada published "Audit Considerations Related to Cryptocurrency Assets and Transactions," which included the mention of intangible assets.

Cryptocurrencies can have various implications for graduate accounting students, both as investors and as participants in the cryptocurrency industry. Cryptocurrencies can offer graduate students new investment opportunities, either as a speculative investment or as a long-term investment in the future of blockchain technology. In addition, cryptocurrencies can offer graduate students new opportunities for investment, research, job seeking, and entrepreneurship. However, graduate students should carefully evaluate the risks and benefits of investing in cryptocurrencies, as the market can be highly volatile and subject to market manipulation. As investors or participants, students should carefully evaluate the risks and benefits of engaging with the cryptocurrency industry and should be prepared to adapt to the rapid changes and uncertainties that are characteristic of the industry.

This study aims to determine whether accounting students have been introduced to cryptocurrencies and their handling during their education. We surveyed current students and recent graduates of accounting about their experiences learning about cryptocurrency in their accounting programs. Recent graduate students with accounting degrees and certifications were tested regarding their understanding of cryptocurrencies.

According to our findings, most students' core curricula do not provide a comprehensive discussion of cryptocurrencies. Instead, cryptocurrencies are introduced only as immaterial assets that must be reported in financial statements, and students are not instructed on auditing or assessing cryptocurrencies. Most students agreed that their professors' lack of cryptocurrency understanding is evident. These results demonstrate that the quality of accounting graduates is hampered by an imbalanced relationship between academics and technological progress. One of the most influential studies (Qasim & Kharbat, 2020) presented the integrated technique for revamping courses at three levels (introductory, intermediate, and advanced) and technologies. We also found that participants were concerned about cryptocurrencies and illegal activities.

This study's primary contribution is its revealing the critical need for a prototype and more regulations from the IFRS covering cryptocurrency categories and data for auditors and accountants to comprehend the issues posed by cryptocurrencies (Ramassa & Leoni, 2022), similar to the Financial Accounting Standards Board (FASB), which issued a new handout for accounting for exchange-traded digital assets in May 2022.

2. Literature Review

Blockchain, DLT, and decentralized

Cryptocurrencies, such as bitcoin, rely on blockchain technology (Shaban, 2020). As the name suggests, blockchains are newer forms of distributed ledger technology (DLT) consisting of a database that keeps transaction data in ledgers in the form of distributed blocks. A block is a periodic ledger or container of data in computing. Each successive block contains the address of the previous block; a chain of cryptographically linked transaction bundles, or blocks, results from each block referencing the previous block (Perlman, 2019). A blockchain is a technique used by a community of users to maintain a shared transaction record. The community verifies each transaction through a consensus method, and verified transactions are consequently recorded in the ledger of a blockchain network (Perlman, 2019; Rahman & Ali, 2020).

DLT resolves difficulties relating to innovation or technology with shared and regulated data and the secure administration of diverse commercial transactions by numerous organizations (Sultan et al., 2018). The system relies on modern cryptographic proofs for distributed authentication in the DLT. Data are stored in DLT blocks, continuously added, and synced between participating nodes in particular networks (Perdana et al., 2021). However, governments and regulatory organizations prefer DLT to blockchains. A decentralized peer-to-peer network is used to conduct cryptocurrency transactions, obviating the requirement for a central authority (Adams & Bailey, 2021; Kostić & Sedej, 2022; Nabilou, 2019; Vincent & Wilkins, 2020). In summary, blockchains are a type of DLT that is decentralized, and decentralization is a key aspect of both blockchain and DLT technologies. DLT is a broader term that encompasses all types of decentralized and distributed ledger technologies, including blockchains.

Cryptocurrencies Under IFRS: Are They Intangible Assets?

Accounting standards do not yet exist for various challenges that accountants may encounter in practice. One such concern is cryptocurrencies. Due to the lack of an accounting standard defining how cryptocurrencies should be accounted for, accountants are compelled to use established accounting standards (Vincent & Wilkins, 2020). However, cryptocurrency holders do not usually possess this type of contractual right. Thus, cryptocurrencies do not appear to fit the definition of a non-cash financial asset in IAS 32 and IFRS 9 (Barker & Teixeira, 2018).

The classification of cryptocurrencies under IFRS is a matter of debate and interpretation. Currently, there is no specific guidance on how to classify cryptocurrencies under the IFRS. However, it is generally considered that cryptocurrencies may be classified as intangible assets under IFRS if they meet the definition of an intangible asset, as stated in IFRS 38. According to IFRS 38, an intangible asset is an identifiable non-monetary asset without physical substance. To meet this definition, a cryptocurrency would need to have specific attributes, such as an identifiable and distinct set of rights and obligations, the ability to generate future economic benefits, and the ability to be sold, transferred, or exchanged (Chou et al., 2022). Therefore, if a cryptocurrency meets the definition of an intangible asset, it would be recorded as an intangible asset on the company's balance sheet, with any changes in its fair value being recognized in the company's income statement.

To summarize, it is important to note that the classification of cryptocurrencies as intangible assets under the IFRS is still subject to interpretation and may differ in different jurisdictions.

Companies and their auditors should exercise judgment and carefully consider the specific facts and circumstances in each case to determine the most appropriate classification under the IFRS.

Cryptocurrencies Under the SEC: Are They Securities?

Cryptocurrency and initial coin offerings are booming. The scope of these markets includes regional, national, and international players and an increasingly diverse spectrum of products and services. Investors and other market participants can face issues because of these developments. In such a market, U.S. federal law regulates investment companies and their operations and establishes industry standards. President Franklin D. Roosevelt signed the Investment Advisers Act of 1940 (Moriarty, 2021), empowering the SEC to oversee investment trusts and counselors. The SEC is comprised of four divisions, and several divisions within it work toward the same goal of protecting investors, ensuring fair, organized, and efficient markets, and promoting the interests of investors (Jorgensen et al., 2007).

However, while the SEC has not issued a definitive ruling on whether all cryptocurrencies are securities, in its guidance, it has stated that many cryptocurrencies may be considered securities and, therefore, subject to federal securities laws (Quamara & Singh, 2022). The SEC applies the Howey test, a court-created test, to determine whether a particular investment is a security. According to the Howey test, an investment is a security if it involves an investment of money in a common enterprise, with the expectation of profits predominantly from the efforts of others. Based on this definition, the SEC has indicated that many initial coin offerings (ICOs) and other cryptocurrency offerings may be considered securities offerings, and, therefore, subject to federal securities laws. For example, if a cryptocurrency is marketed as an investment opportunity and promises a return on investment, the SEC may view it as security (DiMarino & Roberson, 2013; Hacker & Thomale, 2018).

Lastly, it is essential to note that the classification of cryptocurrencies as securities is a fact-specific determination and may vary depending on the specific facts and circumstances of each case. Companies and individuals involved in cryptocurrency offerings should carefully consider the applicable laws and regulations, and consult with legal counsel to determine the appropriate regulatory treatment of their offerings.

Cryptocurrency in School Accounting Books

Accounting rules emphasize responsibility in preparing financial reports to reduce unethical conduct that might endanger stakeholders' assets. Experts have concluded that ethical and responsible behavior in generating financial reports begins in the classroom. Therefore, vital accounting education is necessary to improve the compilation of financial reports. According to Suryawathy and Putra (2016), chief financial officers (CFOs) are worried about the quality of accounting education. Abayadeera et al. (2016) informed stakeholders of the significance of accounting skills for graduates. When accounting instructors can effectively convey information (Suryawathy & Putra, 2016) in a conducive learning environment, these abilities are provided (CPA Canada, 2018; Vroeijenstijn, 2003).

Furthermore, the globalization and development of accounting, such as IFRS, affects accounting education (Needles Jr, 2010), increasing CFOs' demand for improved accountant skills (Mathews, 2001). These demands and rapid changes are fundamental requirements in the educational quality environment. In addition, most accounting books classify cryptocurrencies as intangible assets (Martin et al., 2020); the possibility that cryptocurrencies could be classified differently is not discussed.

Cryptocurrency Accounting and Theoretical Framework

Cryptocurrency accounting and framework theories are still evolving, as the use of cryptocurrencies and their underlying blockchain technology is relatively new. However, several theoretical frameworks have been proposed to help accountants and financial professionals understand how to approach accounting for cryptocurrencies and related transactions. One of the frameworks is based on the concept of "real options," which considers the potential future value of a cryptocurrency investment and how that value can be realized (Sumarti et al., 2021). This framework considers the uncertainty of cryptocurrency prices and the ability of investors to make decisions based on that uncertainty. Another framework is based on the "information economics" perspective, which views cryptocurrencies as a source of information about the state of the underlying blockchain network (Caferra, 2022; Marthinsen & Gordon, 2021). In terms of actual accounting for cryptocurrencies, there are currently no globally accepted standards for how to account for cryptocurrencies in financial statements. However, some guidance has been provided by organizations such as the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB), which have issued information on how to account for cryptocurrencies in general-purpose financial statements.

Thus, although there is still much work to be done to fully understand the implications of cryptocurrency accounting, the existing frameworks and guidance can provide a starting point for accountants and financial professionals as they work to develop a comprehensive approach to accounting for cryptocurrencies.

3. Research Questions

From the standpoint of students, we seek to gain a greater understanding of whether educators have the necessary expertise in cryptocurrency technology through the following research questions:

RQ1: How do accounting professors introduce, explain, and debate cryptocurrencies during the academic years?

Our study focused on explaining how cryptocurrencies in accounting classes might vary, depending on the instructor's personal views and the specific course being taught. However, some common ways accounting professors may introduce, explain, and debate cryptocurrencies in their classes include beginning by explaining what cryptocurrencies are and how they function, including their underlying technology, such as blockchains, and how they differ from traditional fiat currencies. Accounting professors may then explain the accounting implications of cryptocurrencies, such as the challenges in valuation, the need for proper disclosures, and the potential impact on financial statements, as well as the regulations, which should be discussed to show the current regulatory landscape for cryptocurrencies, including the varying approaches taken by different countries, and the implications for companies and investors (Ammous, 2018; Lawson et al., 2014; Showalter & Wilks, 2021).

RQ2: During the academic years, do accounting professors debate the ethical concerns of cryptocurrencies?

As accounting and accountants evolve, they are affected by various factors, including the context within which they operate and the technological advances that affect their capture (Wells, 2018). The curriculum for accounting education is often criticized for needing to represent contemporary accounting practices fully. This can be due to a variety of reasons, including the slow pace of change, emphasis on traditional accounting methods, lack of industry involvement, lack of practical experience, and the fact that accounting education often lacks opportunities for students

to gain valuable experience in real-world accounting scenarios, which can limit their exposure to contemporary accounting practices (Parker et al., 2011; Mathews, 2001). Accordingly, we propose the following research question:

RQ3: Do accounting textbooks used during school years explain cryptocurrency in detail?

Cryptocurrencies are a relatively new development, and their impact on the accounting profession is still evolving. Some accounting textbooks briefly mention cryptocurrencies, and most textbooks generally do not cover the topic in depth. Instead, accounting professors may supplement their courses with additional readings, case studies, and other materials to provide students with a more comprehensive understanding of this emerging area (e.g., Abayadeera et al., 2016; Suryawathy & Putra, 2016; Vroeijenstijn, 2003). It is likely that, as the use and impact of cryptocurrencies continue to grow, they will receive more attention in accounting textbooks and courses in the future. This means that firms may examine new employees' competencies to identify development needs. Despite the increased interest in this area, no studies have examined development programs for accountants on cryptocurrency. Consequently, we propose our final research question:

RQ4: Do accounting firms provide on-the-job training on cryptocurrency?

Recently, many accounting firms have begun to provide training on cryptocurrency to their employees. As the use of cryptocurrencies becomes more widespread, accounting firms are recognising the importance of having a knowledgeable workforce that understands the accounting implications of these emerging technologies (Stern & Reinstein, 2021). The nature and extent of cryptocurrency training provided by accounting firms can, however, vary widely, ranging from brief overviews to comprehensive courses. Some firms may offer in-house training sessions or workshops, while others may provide online courses or other training materials. The training may focus on a range of topics, including the basics of cryptocurrencies, the implications of accounting and financial reporting, and the regulatory landscape. Overall, providing training on cryptocurrency is becoming increasingly important for accounting firms as the use of these technologies continues to grow, and it is likely that this trend will continue in the future.

4. Research Method

This study examines the knowledge, experiences, and perceived outcomes of students who have completed CPA studies and recent graduates who enroll in a CPA program. To investigate our research question, we conducted semi-structured interviews. These semi-structured interviews offer precise information on individual real-world students' experiences with cryptocurrencies, allowing us to better understand how they acquire crypto knowledge. A virtual interview process was conducted with 57 recently qualified accountants. To ensure diversity across universities and colleges in Canada, we identified interviewees through our contacts. One coauthor conducted a thorough question-by-question analysis in keeping with the study's interpretive focus (Hermanson et al., 2012). This coauthor classified and categorized replies by their frequency of occurrence; the coauthor conferred with the other coauthors as needed. A second coauthor evaluated the data file and chose quotes from the interviews to prepare the manuscript. Along with the initial coauthor, two more coauthors analyzed the patterns of the results and quoted discussions for consistency with their perceptions. This study used Han's (2015) quoting method to present the results.

All participants had received their credentials within the last five years. We estimated that government entities employ 35% of the population. Two-fifths (40%) are employed by major companies, whereas small companies employ 27%. Three-quarters (73%) of the participants invested in cryptocurrencies, although none analyzed them in their jobs. Just over a third (35%) started to invest in cryptocurrencies while at school, the majority in 2019. All participants had to provide a copy of their degree certificates in accounting for reliability.

4.1. Semi-Structured Interviews

Overall, semi-structured interviews can be a valuable tool for studying cryptocurrencies because they allow researchers to collect rich, detailed data on participants' experiences, perspectives, and behaviors (Obreja, 2022). We conducted interviews with 57 recent accounting graduates. We randomly selected the sample from five public universities and two public colleges enrolled in the CPA Canada program that participated in the interviews in 2021.

Table 1 summarizes the characteristics of the interviewees, including education, qualifications, age, gender, and experience. As shown, most of our interviews were with accountants (67%), followed by senior accountants (33%). Of these, 77% had a bachelor's degree in accounting, and

23% had a master's degree in accounting. In addition, 14% of interviewees had CPA qualifications. In terms of experience, 46% of interviewees had long periods of work experience in their current firm (>5 years), 42% had medium experience (2–4 years), and 12% had an experience of one year. Our analysis showed that 87% of our participants were between 22 and 29 years old, and 13% were 30 years and older. Our sample included 26% male and 74% female interviewees. Together, these statistics suggest that our interviewees were sufficiently well-qualified and experienced to provide in-depth insights about cryptocurrencies in accounting schools. The study focuses on the Canadian market, since the researchers had access to participants there. The principal researcher teaches at a Canadian institution with access to individuals and accounting program expertise in Canada.

<INSERT TABLE 1 HERE>

Semi-structured interviews, guided by a set script, enabled us to explore the fundamental positions of cryptocurrency among the participants. This method conforms to the methods of various scholars' methods (Beasley et al., 2009). At least two study team members were present at each interview. Each interview lasted around 20 minutes, and all interviewees consented to be videotaped. Based on the questions in the interview guide, the interview responses were initially categorized into topics and then into emerging themes. The experts reached a consensus on coded topics and themes through a series of iterations.

5. Results

Research Question 1

Accounting professors may have a wide range of experience with cryptocurrencies and blockchain technology. As the cryptocurrency industry continues to evolve, accounting professors will likely play an important role in developing accounting practices and standards that can help ensure the transparency and accuracy of cryptocurrency transactions (Ammous, 2018).

Our initial step in designing our interviews was to ascertain whether the professors had accounting competence. Overall, 62% of respondents provided concrete examples of their professor's superior accounting knowledge, indicating students' confidence in assessing their professor's accounting knowledge and experience. According to the respondents, accounting lecturers were mostly CPA graduates who worked in major accounting firms. These skills and experiences aided

significantly in explaining the accounting topic. The following quotes demonstrate this "discovery" of accounting professors' job skills and backgrounds.

> *"I have a pretty professional faculty to learn from. They know about vast things. They were so easy to approach. I remember three of my accounting professors worked at KPMJ. I think that helped us learn more and better." (P2)*

> *"My lecturers used to offer us significant examples from their past job experience and provide us with difficulties that required us to collaborate to determine a solution [for] customers. I honestly thought this to be very fascinating ... I discovered that I probably want to get further knowledge in this area." (P24)*

> *"Now that I work as an accountant, I think, 'Oh. I completely get all of the instances my instructors illustrated in class, and their expertise has increased my confidence in reaching this point at my present company'". (P7)*

It is crucial to demonstrate that students can assess instructors' knowledge levels to ascertain whether they can judge their understanding of cryptocurrency. The overwhelming majority of our participants were dissatisfied that their accounting instructors had never covered cryptocurrency in class, even though the vast expertise of their accounting professors had benefitted them in general. A few individuals acknowledged that instructors discussed cryptocurrencies but not accounting treatments or auditing cryptos. These views are conveyed in the following quotes:

> *"My instructors used to insist that we must live in the present. So, to live, individuals must learn new things. As a result, they spent time talking about cryptocurrencies but were never about financial treatment". (P15)*

> *"My professors are knowledgeable, but they have never really discussed such topics... I do not recall any of them ever mentioning bitcoins." (P8)*

> *"Cryptocurrency or bitcoin should be taught to students ... Regrettably, our lecturers never fully addressed such issues in class, and the ones who did were against bitcoins." (P17)*

These quotes highlight the variation in the knowledge and abilities of accounting professors. According to the participants, they had a high degree of confidence in their capacity to determine

the level of expertise of certain lecturers. The differences between accounting university graduates and college professors regarding their knowledge and skills were not substantial. This diversity of experience of accounting professors is consistent with prior studies (Bhaskar, 1983; Romney, 1983) and demonstrates the profession's willingness to hire academics with diverse skill sets. Another probable explanation is that most accounting professors earned their degrees before cryptocurrencies were introduced, rendering them incapable of educating students.

Research Question 2

Our analysis showed that many participants' professors were concerned about cryptocurrencies and ethics, corresponding to an earlier study (Barth et al., 2020; Vincent & Wilkins, 2020). We inquired about the respondents' and their professors' perspectives on cryptocurrencies to evaluate whether they shared the same perspective. According to most respondents, cryptocurrencies were primarily used for money laundering, illegal currency exchanges and platforms, and underground black markets. As expected, participants whose instructor was opposed to cryptocurrencies were hostile to cryptocurrency investments and transactions. In addition, our findings show that the concerns mentioned during the interview did not stop most accounting graduates from investing in cryptocurrencies. Due to a lack of awareness and ethical challenges, participants were learning more about crypto concerning accounting and audit procedures; they felt that cryptocurrencies would not vanish due to ethical concerns, and as more significant corporations invest in bitcoins. These views are conveyed in the following quotes:

> *"It is well known that drug dealers use cryptocurrencies." (P14)*
>
> *"There are so many issues surrounding bitcoin, take real states in Canada as an example, how international money is being used to legitimate the money". (P4)*
>
> *"I have many concerns about crypto…… drugs being the main reason." (P31)*
>
> *"I do think cryptocurrency is here to stay … If governments issued their cryptocurrency in a few years, we would not see the mess in the market… and illegal activities will disappear." (P22)*
>
> *"I recall my professors talking about bitcoins and how drug dealers are using bitcoin… I feel it is better to be far away for now from bitcoin." (P27)*

Accordingly, our analysis results are consistent with prior studies, which found that government and regulatory bodies are increasingly focusing on the ethical considerations of cryptocurrencies. Unethical conduct, such as market manipulation or fraudulent ICOs, can lead to increased regulation and scrutiny, which can affect the valuation and adoption of cryptocurrencies (Bagus & De la Horra, 2021). In addition, ethics play a critical role in the adoption and valuation of cryptocurrencies. It is important for investors, companies, and regulators to promote ethical practices and hold those who engage in unethical conduct accountable (Dierksmeier & Seele, 2018). This can help build trust, protect the reputation of the industry, and ensure the long-term success of cryptocurrencies.

Research Question 3

Developing accounting books for cryptocurrencies can be a complex task, but it is important for individuals and companies that hold, trade, or mine cryptocurrencies to accurately track and report their cryptocurrency transactions. By doing so, they can comply with tax and regulatory requirements, and make informed decisions about their cryptocurrency holdings (Abayadeera et al., 2016). Therefore, regarding whether accounting textbooks include cryptocurrencies, the students had differing viewpoints. More than half of the respondents said that cryptocurrencies were never discussed in their textbooks. These views are conveyed in the following quotes:

> *"I have never read anything about it in the previous version of books. Probably, the new versions may contain a little information on it." (P41)*

> *"I do not remember having encountered such a subject during my accounting studies in the books. I would remember if I saw it, given that I had reviewed my accounting books while preparing for my CPA." (P52)*

> *"I had never seen it, even when I was studying for my CPA. I went through all my CPA materials and CPA competencies books; I never had the opportunity to read about them… I firmly believed that no textbook stated anything about crypto." (P39)*

The remaining participants reported that the textbook devoted just one page to cryptography without providing examples or problems, or if they did, the examples were not helpful. Students agreed that the textbook's material on intangibles covered cryptocurrency, but according to them,

the handling of cryptocurrency in the book was insufficient for the subject, since an increasing number of businesses were embracing cryptocurrencies. These views are conveyed in the following quotes:

> *"I remember that my Intermediate Accounting volume 2 accounting textbook discussed cryptocurrency, but I think it was an introduction page, maybe in a one or two page only and was classified as intangible assets". (P30)*

> *"Since I am investing in crypto, this caught my attention… I think there was one column in one of the chapters." (P9)*

The respondents were able to offer precise justifications for their positions in response to a subsequent inquiry. Their responses centered on crypto as a new problem, indicating that future textbooks would need more resources to accommodate the growing number of crypto investors. Students cited the writers' lack of knowledge regarding cryptocurrency as a contributing factor. These views are conveyed in the following quotes:

> *"I do not believe the textbook included information about bitcoin, which is a new subject. It may take a few years before doing so." (P24)*

> *"I think the book's author has no in-depth knowledge about crypto, so they did not expand on the subject … Remember, it is a very new subject …, and people still test the water." (P29)*

> *"I think if more people and companies invest in crypto, the more demand for information's needed. Which I believe will be in new editions of the accounting textbook". (P51)*

This result indicates a dearth of information available in the textbooks. Whether or not the interviewees stated that the cryptocurrency was discussed in the book, the fact remains that it was barely mentioned, indicating that students are incapable of addressing the accounting treatment of a cryptocurrency. This result contradicts prior studies (Hammond et al., 2015). As a result of their examination of accounting textbooks, which revealed that accounting textbooks are being revised at an accelerating rate and that accounting professors believe the rate of change should be slowed, faculty members who are not textbook authors deem frequent textbook revisions to be of diminishing value.

Research Question 4

Most universities and colleges in Canada provide an accounting co-op designed for students interested in acquiring work experience in accounting firms. Students in accounting must complete one semester of working for a firm to be able to graduate from the program. All participants completed the program in their current or prior place of employment. Participants reported that their work while in school was an entry-level role, and that the training they obtained was relevant to their daily duties and understanding of the firm structures. Many in-hire positions reported that their training was only related to the new job and did not extend to other areas, such as cryptocurrencies. A few participants indicated that their firm had specialist departments and personnel who dealt with cryptocurrency investment, yet they had no interaction due to the nature of their jobs. These views are conveyed in the following quotes:

> *"I have been investing in cryptocurrency since 2019. Thus, I have become acquainted with it. Nevertheless, I have never been trained at work about classifying crypto." (P11)*

> *"Last year, I started my job as an account receivable clerk. I have been reading much about it since my co-op was mainly about bookkeeping while I was at school … my firm does not deal with crypto; it is a small firm … My supervisor invests in crypto. We sometimes discuss the crypto but not in terms of accounting classification auditing". (P26)*

> *"I was surprised when I learned that we have a specialist in crypto in our firms. Some of our companies invest in crypto … But I rarely see or talk to the people who deal with crypto investors." (P31)*

> *"My work is not related to crypto, and as a result, I have not been informed about it. Even though we have a large number of firms who invest in crypto … our database has information about crypto to read, but it's only accessible for people whose work relates to bitcoin." (P2)*

> *"Since I completed school, I have worked as an auditor at the government agency; so far, I did not have any clients who invested in crypto. Therefore, I never had training. I do not recall anyone at my workplace discussing the crypto … most of*

them believe it is a scam……but as we provide public service, I think we should know about crypto." (P27)

Our results supported prior research that documented that graduate students may have a wide range of experiences with cryptocurrencies, depending on their interests and professional goals. Cryptocurrencies are a rapidly evolving field, and graduate students who engage with them may have the opportunity to gain valuable skills, develop new ideas, and make important contributions to the industry (Hasan et al., 2022).

6. Conclusion

Since cryptocurrency is a relatively new concept in accounting, laws are alarmingly absent. The challenges presented by the SEC in its quest to regulate cryptocurrencies and classify most of them as financial securities put pressure on the international standard to assess its definition of security through the lens of IFRS and offer a more accurate classification of cryptocurrency. Whereas student investors are aware of the underlying principles of cryptocurrency, most graduates with accounting degrees continue to face difficulties due to a lack of knowledge about cryptocurrencies or a lack of resources. We also discovered that recent accounting graduates had only the slightest awareness of cryptocurrencies, likely due to a lack of professors' comprehension of or exposure to the issue. Our primary contribution is to understand whether accounting graduates are prepared to conduct accounting and auditing work regarding cryptocurrencies in the future.

Our analysis showed that several textbooks have been revised and no longer included the appropriate section on cryptocurrencies. Another objection might be made about the instructors' expertise in cryptocurrencies, since the subject was not featured in the textbook and was thus not discussed in class. This is a reasonable point; however, most participants reported that they discussed cryptocurrencies with their professors and either opposed cryptocurrency for ethical reasons or had a limited understanding of it. Several actions can be taken by schools in response to these findings, including collaboration with the CPA, regulators, and academic book authors to provide more resources about cryptocurrencies. Accounting schools should educate academics on cryptocurrencies and encourage instructors to include cryptocurrency-related content in their courses. Furthermore, we suggest that accounting textbooks should contain a section on cryptocurrencies. Students should learn about cryptocurrencies through CPA and Canada's cryptocurrency exams. In addition to developing criteria for evaluating whether cryptocurrencies

qualify as securities, IFRS committees should comprehensively examine cryptocurrency classification.

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Table 1. Interviewees

Institution	Interviewee (Participant)	Position	Age	Gender	Academic qualification	Professional qualification	Years of firm experience
College 2	1	A	28	Female	BA		5
University 2	2	A	27	Female	BA		5
University 2	3	A	22	Male	BA		4
University 5	4	A	29	Female	BA		5
College 2	5	A	27	Female	BA		4
University 4	6	A	26	Female	BA		4
College 1	7	A	28	Female	BA		5
College 1	8	A	27	Female	BA		3
University 5	9	SA	33	Male	MA	CPA	5
College 2	10	A	24	Female	BA		4
University 3	11	A	27	Male	BA		3
University 3	12	SA	32	Female	MA	CPA	5
University 3	13	SA	24	Female	BA		2
College 1	14	A	28	Male	BA		5
University 4	15	A	27	Female	BA		3
College 1	16	A	29	Female	BA		5
University 1	17	A	24	Female	BA		2
University 1	18	A	23	Female	BA		1
University 5	19	A	29	Male	BA		5
College 2	20	SA	28	Female	BA		4
University 2	21	A	27	Female	BA		4
University 2	22	SA	29	Female	BA		5
College 1	23	SA	35	Male	MA	CPA	5
University 4	24	SA	29	Female	BA		5
University 3	25	A	24	Female	BA		2
College 1	26	A	26	Female	BA		3
University 5	27	A	22	Male	BA		1
University 3	28	A	28	Female	BA		4
College 1	29	SA	32	Female	MA	CPA	5
University 5	30	SA	27	Male	BA		5
University 1	31	SA	29	Female	MA		5
College 1	32	A	26	Female	BA		4
University 2	33	SA	31	Male	MA	CPA	5
University 4	34	A	29	Female	BA		5
College 1	35	A	26	Female	BA		3
University 1	36	SA	28	Female	MA		5
College 1	37	A	25	Male	BA		3
University 4	38	A	27	Female	BA		5
University 3	39	A	23	Female	BA		2
College 1	40	SA	27	Female	MA		5
University 1	41	SA	29	Female	MA		5

University 2	42	A	27	Female	BA		3
University 4	43	A	26	Male	BA		3
University 4	44	A	26	Female	BA		4
University 3	45	SA	27	Female	BA		5
University 1	46	A	23	Female	BA		1
University 3	47	A	28	Female	BA		5
University 3	48	SA	34	Male	MA	CPA	6
University 2	49	A	28	Female	BA		4
University 4	50	A	23	Female	MA		1
College 1	51	SA	29	Male	BA		5
University 5	52	A	28	Female	BA		4
University 3	53	SA	30	Male	MA	CPA	5
University 2	54	A	22	Female	BA		1
College 2	55	A	24	Female	BA		1
University 1	56	SA	29	Male	MA	CPA	8
University 2	57	A	27	Female	BA		3

Notes: SA – Senior Accountant, A – Accountant, MA – Master's in accounting, BA – Bachelor's in Accounting.

Cryptocurrencies in Accounting Schools?

Abstract

Purpose – This study aims to investigate the extent to which newly certified public accountants (CPAs) and accounting graduate students possess a comprehensive understanding of cryptocurrencies and the skills they have acquired throughout their education.

Design/methodology/approach – A qualitative analysis was used through semi-structured interviews to obtain an in-depth insight into cryptocurrencies, which could not be investigated easily through quantitative methods, and to provide an understanding of the context for cryptocurrencies from CPA and non-CPA students' points of view. This was in addition to focusing on understanding the differences between the students' thoughts.

Findings – This study found that recent accounting graduates and CPA members have the least awareness of cryptocurrencies, likely due to a lack of professors' comprehension or exposure to the concept. However, students involved in forensic courses provided more information about cryptocurrencies compared with other students.

Research limitations/implications – Our data are limited to only a single country. Given that cryptocurrencies are a relatively new notion in accounting, there is an alarming lack of legislation. Further, we found that recent accounting graduates and CPAs had the same level of knowledge of cryptocurrencies, most probably due to a lack of exposure during their education and academics' limited understanding of the concept.

Practical implications – The students' differing answers about cryptocurrencies show differences in their current level of understanding of cryptocurrencies.

Originality/value – This study has identified that the vast majority of accounting graduates lack adequate knowledge about cryptocurrencies or access to adequate resources, despite understanding the fundamental concepts of cryptocurrency.

Keywords: cryptocurrency; accounting graduates; education; knowledge; professors.

1. Introduction

In recent years, the emergence of new technology has transformed business procedures (Shaban, 2020). Experts have indicated that modern technology has considerably influenced the accounting profession (Al-Htaybat et al., 2018; Ferreira-Lopes et al., 2020). Integration is encouraged by the increasing significance of technology in the accounting and auditing professions. However, a fundamental understanding of the technological foundations of new technologies, such as cryptocurrencies, is needed (Phillip et al., 2018), as more companies begin to invest in cryptocurrencies, and investors are more interested than ever. The absence of meaningful formal guidance from generally accepted accounting procedures (GAAP) standards on cryptocurrencies is a substantial impediment for stakeholders (Yatsyk, 2018). This is an essential subject for both accountants and players in the market.

Cryptocurrency, which is categorized as an intangible asset under the current accounting standards (Vincent & Wilkins, 2020), has not received exceptional guidance from the International Financial Reporting Standards (IFRS). The Securities and Exchange Commission (SEC) maintains that several cryptocurrencies should be deemed securities (Hacker & Thomale, 2018); thus, businesses should classify them as financial instruments as opposed to intangible assets (Vincent & Wilkins, 2020). In "Holdings of Cryptocurrencies – June 2019" (Tsuji, 2020), the IFRS Committee determined that bitcoin holdings are not financial assets. Recently, CPA Canada published "Audit Considerations Related to Cryptocurrency Assets and Transactions," which included the mention of intangible assets.

Cryptocurrencies can have various implications for graduate accounting students, both as investors and as participants in the cryptocurrency industry. Cryptocurrencies can offer graduate students new investment opportunities, either as a speculative investment or as a long-term investment in the future of blockchain technology. In addition, cryptocurrencies can offer graduate students new opportunities for investment, research, job seeking, and entrepreneurship. However, graduate students should carefully evaluate the risks and benefits of investing in cryptocurrencies, as the market can be highly volatile and subject to market manipulation. As investors or participants, students should carefully evaluate the risks and benefits of engaging with the cryptocurrency industry and should be prepared to adapt to the rapid changes and uncertainties that are characteristic of the industry.

This study aims to determine whether accounting students have been introduced to cryptocurrencies and their handling during their education. We surveyed current students and recent graduates of accounting about their experiences learning about cryptocurrency in their accounting programs. Recent graduate students with accounting degrees and certifications were tested regarding their understanding of cryptocurrencies.

According to our findings, most students' core curricula do not provide a comprehensive discussion of cryptocurrencies. Instead, cryptocurrencies are introduced only as immaterial assets that must be reported in financial statements, and students are not instructed on auditing or assessing cryptocurrencies. Most students agreed that their professors' lack of cryptocurrency understanding is evident. These results demonstrate that the quality of accounting graduates is hampered by an imbalanced relationship between academics and technological progress. One of the most influential studies (Qasim & Kharbat, 2020) presented the integrated technique for revamping courses at three levels (introductory, intermediate, and advanced) and technologies. We also found that participants were concerned about cryptocurrencies and illegal activities.

This study's primary contribution is its revealing the critical need for a prototype and more regulations from the IFRS covering cryptocurrency categories and data for auditors and accountants to comprehend the issues posed by cryptocurrencies (Ramassa & Leoni, 2022), similar to the Financial Accounting Standards Board (FASB), which issued a new handout for accounting for exchange-traded digital assets in May 2022.

2. Literature Review

Blockchain, DLT, and decentralized

Cryptocurrencies, such as bitcoin, rely on blockchain technology (Shaban, 2020). As the name suggests, blockchains are newer forms of distributed ledger technology (DLT) consisting of a database that keeps transaction data in ledgers in the form of distributed blocks. A block is a periodic ledger or container of data in computing. Each successive block contains the address of the previous block; a chain of cryptographically linked transaction bundles, or blocks, results from each block referencing the previous block (Perlman, 2019). A blockchain is a technique used by a community of users to maintain a shared transaction record. The community verifies each transaction through a consensus method, and verified transactions are consequently recorded in the ledger of a blockchain network (Perlman, 2019; Rahman & Ali, 2020).

DLT resolves difficulties relating to innovation or technology with shared and regulated data and the secure administration of diverse commercial transactions by numerous organizations (Sultan et al., 2018). The system relies on modern cryptographic proofs for distributed authentication in the DLT. Data are stored in DLT blocks, continuously added, and synced between participating nodes in particular networks (Perdana et al., 2021). However, governments and regulatory organizations prefer DLT to blockchains. A decentralized peer-to-peer network is used to conduct cryptocurrency transactions, obviating the requirement for a central authority (Adams & Bailey, 2021; Kostić & Sedej, 2022; Nabilou, 2019; Vincent & Wilkins, 2020). In summary, blockchains are a type of DLT that is decentralized, and decentralization is a key aspect of both blockchain and DLT technologies. DLT is a broader term that encompasses all types of decentralized and distributed ledger technologies, including blockchains.

Cryptocurrencies Under IFRS: Are They Intangible Assets?

Accounting standards do not yet exist for various challenges that accountants may encounter in practice. One such concern is cryptocurrencies. Due to the lack of an accounting standard defining how cryptocurrencies should be accounted for, accountants are compelled to use established accounting standards (Vincent & Wilkins, 2020). However, cryptocurrency holders do not usually possess this type of contractual right. Thus, cryptocurrencies do not appear to fit the definition of a non-cash financial asset in IAS 32 and IFRS 9 (Barker & Teixeira, 2018).

The classification of cryptocurrencies under IFRS is a matter of debate and interpretation. Currently, there is no specific guidance on how to classify cryptocurrencies under the IFRS. However, it is generally considered that cryptocurrencies may be classified as intangible assets under IFRS if they meet the definition of an intangible asset, as stated in IFRS 38. According to IFRS 38, an intangible asset is an identifiable non-monetary asset without physical substance. To meet this definition, a cryptocurrency would need to have specific attributes, such as an identifiable and distinct set of rights and obligations, the ability to generate future economic benefits, and the ability to be sold, transferred, or exchanged (Chou et al., 2022). Therefore, if a cryptocurrency meets the definition of an intangible asset, it would be recorded as an intangible asset on the company's balance sheet, with any changes in its fair value being recognized in the company's income statement.

To summarize, it is important to note that the classification of cryptocurrencies as intangible assets under the IFRS is still subject to interpretation and may differ in different jurisdictions.

Companies and their auditors should exercise judgment and carefully consider the specific facts and circumstances in each case to determine the most appropriate classification under the IFRS.

Cryptocurrencies Under the SEC: Are They Securities?

Cryptocurrency and initial coin offerings are booming. The scope of these markets includes regional, national, and international players and an increasingly diverse spectrum of products and services. Investors and other market participants can face issues because of these developments. In such a market, U.S. federal law regulates investment companies and their operations and establishes industry standards. President Franklin D. Roosevelt signed the Investment Advisers Act of 1940 (Moriarty, 2021), empowering the SEC to oversee investment trusts and counselors. The SEC is comprised of four divisions, and several divisions within it work toward the same goal of protecting investors, ensuring fair, organized, and efficient markets, and promoting the interests of investors (Jorgensen et al., 2007).

However, while the SEC has not issued a definitive ruling on whether all cryptocurrencies are securities, in its guidance, it has stated that many cryptocurrencies may be considered securities and, therefore, subject to federal securities laws (Quamara & Singh, 2022). The SEC applies the Howey test, a court-created test, to determine whether a particular investment is a security. According to the Howey test, an investment is a security if it involves an investment of money in a common enterprise, with the expectation of profits predominantly from the efforts of others. Based on this definition, the SEC has indicated that many initial coin offerings (ICOs) and other cryptocurrency offerings may be considered securities offerings, and, therefore, subject to federal securities laws. For example, if a cryptocurrency is marketed as an investment opportunity and promises a return on investment, the SEC may view it as security (DiMarino & Roberson, 2013; Hacker & Thomale, 2018).

Lastly, it is essential to note that the classification of cryptocurrencies as securities is a fact-specific determination and may vary depending on the specific facts and circumstances of each case. Companies and individuals involved in cryptocurrency offerings should carefully consider the applicable laws and regulations, and consult with legal counsel to determine the appropriate regulatory treatment of their offerings.

Cryptocurrency in School Accounting Books

Accounting rules emphasize responsibility in preparing financial reports to reduce unethical conduct that might endanger stakeholders' assets. Experts have concluded that ethical and responsible behavior in generating financial reports begins in the classroom. Therefore, vital accounting education is necessary to improve the compilation of financial reports. According to Suryawathy and Putra (2016), chief financial officers (CFOs) are worried about the quality of accounting education. Abayadeera et al. (2016) informed stakeholders of the significance of accounting skills for graduates. When accounting instructors can effectively convey information (Suryawathy & Putra, 2016) in a conducive learning environment, these abilities are provided (CPA Canada, 2018; Vroeijenstijn, 2003).

Furthermore, the globalization and development of accounting, such as IFRS, affects accounting education (Needles Jr, 2010), increasing CFOs' demand for improved accountant skills (Mathews, 2001). These demands and rapid changes are fundamental requirements in the educational quality environment. In addition, most accounting books classify cryptocurrencies as intangible assets (Martin et al., 2020); the possibility that cryptocurrencies could be classified differently is not discussed.

Cryptocurrency Accounting and Theoretical Framework

Cryptocurrency accounting and framework theories are still evolving, as the use of cryptocurrencies and their underlying blockchain technology is relatively new. However, several theoretical frameworks have been proposed to help accountants and financial professionals understand how to approach accounting for cryptocurrencies and related transactions. One of the frameworks is based on the concept of "real options," which considers the potential future value of a cryptocurrency investment and how that value can be realized (Sumarti et al., 2021). This framework considers the uncertainty of cryptocurrency prices and the ability of investors to make decisions based on that uncertainty. Another framework is based on the "information economics" perspective, which views cryptocurrencies as a source of information about the state of the underlying blockchain network (Caferra, 2022; Marthinsen & Gordon, 2021). In terms of actual accounting for cryptocurrencies, there are currently no globally accepted standards for how to account for cryptocurrencies in financial statements. However, some guidance has been provided by organizations such as the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB), which have issued information on how to account for cryptocurrencies in general-purpose financial statements.

Thus, although there is still much work to be done to fully understand the implications of cryptocurrency accounting, the existing frameworks and guidance can provide a starting point for accountants and financial professionals as they work to develop a comprehensive approach to accounting for cryptocurrencies.

3. Research Questions

From the standpoint of students, we seek to gain a greater understanding of whether educators have the necessary expertise in cryptocurrency technology through the following research questions:

RQ1: How do accounting professors introduce, explain, and debate cryptocurrencies during the academic years?

Our study focused on explaining how cryptocurrencies in accounting classes might vary, depending on the instructor's personal views and the specific course being taught. However, some common ways accounting professors may introduce, explain, and debate cryptocurrencies in their classes include beginning by explaining what cryptocurrencies are and how they function, including their underlying technology, such as blockchains, and how they differ from traditional fiat currencies. Accounting professors may then explain the accounting implications of cryptocurrencies, such as the challenges in valuation, the need for proper disclosures, and the potential impact on financial statements, as well as the regulations, which should be discussed to show the current regulatory landscape for cryptocurrencies, including the varying approaches taken by different countries, and the implications for companies and investors (Ammous, 2018; Lawson et al., 2014; Showalter & Wilks, 2021).

RQ2: During the academic years, do accounting professors debate the ethical concerns of cryptocurrencies?

As accounting and accountants evolve, they are affected by various factors, including the context within which they operate and the technological advances that affect their capture (Wells, 2018). The curriculum for accounting education is often criticized for needing to represent contemporary accounting practices fully. This can be due to a variety of reasons, including the slow pace of change, emphasis on traditional accounting methods, lack of industry involvement, lack of practical experience, and the fact that accounting education often lacks opportunities for students

to gain valuable experience in real-world accounting scenarios, which can limit their exposure to contemporary accounting practices (Parker et al., 2011; Mathews, 2001). Accordingly, we propose the following research question:

RQ3: Do accounting textbooks used during school years explain cryptocurrency in detail?

Cryptocurrencies are a relatively new development, and their impact on the accounting profession is still evolving. Some accounting textbooks briefly mention cryptocurrencies, and most textbooks generally do not cover the topic in depth. Instead, accounting professors may supplement their courses with additional readings, case studies, and other materials to provide students with a more comprehensive understanding of this emerging area (e.g., Abayadeera et al., 2016; Suryawathy & Putra, 2016; Vroeijenstijn, 2003). It is likely that, as the use and impact of cryptocurrencies continue to grow, they will receive more attention in accounting textbooks and courses in the future. This means that firms may examine new employees' competencies to identify development needs. Despite the increased interest in this area, no studies have examined development programs for accountants on cryptocurrency. Consequently, we propose our final research question:

RQ4: Do accounting firms provide on-the-job training on cryptocurrency?

Recently, many accounting firms have begun to provide training on cryptocurrency to their employees. As the use of cryptocurrencies becomes more widespread, accounting firms are recognising the importance of having a knowledgeable workforce that understands the accounting implications of these emerging technologies (Stern & Reinstein, 2021). The nature and extent of cryptocurrency training provided by accounting firms can, however, vary widely, ranging from brief overviews to comprehensive courses. Some firms may offer in-house training sessions or workshops, while others may provide online courses or other training materials. The training may focus on a range of topics, including the basics of cryptocurrencies, the implications of accounting and financial reporting, and the regulatory landscape. Overall, providing training on cryptocurrency is becoming increasingly important for accounting firms as the use of these technologies continues to grow, and it is likely that this trend will continue in the future.

4. Research Method

This study examines the knowledge, experiences, and perceived outcomes of students who have completed CPA studies and recent graduates who enroll in a CPA program. To investigate our research question, we conducted semi-structured interviews. These semi-structured interviews offer precise information on individual real-world students' experiences with cryptocurrencies, allowing us to better understand how they acquire crypto knowledge. A virtual interview process was conducted with 57 recently qualified accountants. To ensure diversity across universities and colleges in Canada, we identified interviewees through our contacts. One coauthor conducted a thorough question-by-question analysis in keeping with the study's interpretive focus (Hermanson et al., 2012). This coauthor classified and categorized replies by their frequency of occurrence; the coauthor conferred with the other coauthors as needed. A second coauthor evaluated the data file and chose quotes from the interviews to prepare the manuscript. Along with the initial coauthor, two more coauthors analyzed the patterns of the results and quoted discussions for consistency with their perceptions. This study used Han's (2015) quoting method to present the results.

All participants had received their credentials within the last five years. We estimated that government entities employ 35% of the population. Two-fifths (40%) are employed by major companies, whereas small companies employ 27%. Three-quarters (73%) of the participants invested in cryptocurrencies, although none analyzed them in their jobs. Just over a third (35%) started to invest in cryptocurrencies while at school, the majority in 2019. All participants had to provide a copy of their degree certificates in accounting for reliability.

4.1. Ethical Procedures

Ethical procedures in research are crucial for protecting the rights and dignity of research participants and ensuring that research is conducted in a manner that upholds scientific integrity. Therefore, we followed several steps to ensure that our research adheres to ethical standards and sought guidance from ethical review committees.

According to the 46.101(b) Categories of Exempt Human Subjects Research, our research is exempt based on the first and second categories. However, our process to obtain this exemption started with the development of a consent form and interview script, which we provided to the IRB. After obtaining the IRB exemption (#18860), we ensured that the data we collected from

participants was kept confidential and secure by providing a password-protected laptop that was used for research purposes only. We informed the participants that the information would be destroyed from the laptop after three years.

Participants were notified that each interview was expected to last 15 to 20 minutes and would be held in a private room provided by each university for this purpose. Participants were provided with consent forms and interview copies an hour before their scheduled interview time. The interviews were recorded by taking notes with paper and pen, and no audio or video recording was used. To ensure privacy, each participant was recorded using their initials. We also ensured that our sample consisted of individuals aged between 21 and 33 with a background in accounting and experience in the accounting field to ensure that all interview information was related to our research topic. Additionally, we ensured that our sample included individuals of all gender identities.

Furthermore, we provided the participants with all the information about the research, including the research aim, the low risk involved (as their name and university would not appear in our research), potential results, and contributions for this research. Additionally, all participants were notified that they could leave at any time if they felt under pressure during the interview.

4.2. Semi-Structured Interviews

Overall, semi-structured interviews can be a valuable tool for studying cryptocurrencies because they allow researchers to collect rich, detailed data on participants' experiences, perspectives, and behaviors (Obreja, 2022). We conducted interviews with 57 recent accounting graduates. We randomly selected the sample from five public universities and two public colleges enrolled in the CPA Canada program that participated in the interviews in 2021.

Table 1 summarizes the characteristics of the interviewees, including education, qualifications, age, gender, and experience. As shown, most of our interviews were with accountants (67%), followed by senior accountants (33%). Of these, 77% had a bachelor's degree in accounting, and 23% had a master's degree in accounting. In addition, 14% of interviewees had CPA qualifications. In terms of experience, 46% of interviewees had long periods of work experience in their current firm (>5 years), 42% had medium experience (2–4 years), and 12% had an experience of one year. Our analysis showed that 87% of our participants were between 22 and 29 years old, and 13% were 30 years and older. Our sample included 26% male and 74% female

interviewees. Together, these statistics suggest that our interviewees were sufficiently well-qualified and experienced to provide in-depth insights about cryptocurrencies in accounting schools. The study focuses on the Canadian market, since the researchers had access to participants there. The principal researcher teaches at a Canadian institution with access to individuals and accounting program expertise in Canada.

<INSERT TABLE 1 HERE>

Semi-structured interviews, guided by a set script, enabled us to explore the fundamental positions of cryptocurrency among the participants. This method conforms to the methods of various scholars' methods (Beasley et al., 2009). At least two study team members were present at each interview. Each interview lasted around 20 minutes, and all interviewees consented to be videotaped. Based on the questions in the interview guide, the interview responses were initially categorized into topics and then into emerging themes. The experts reached a consensus on coded topics and themes through a series of iterations.

5. Results

Research Question 1

Accounting professors may have a wide range of experience with cryptocurrencies and blockchain technology. As the cryptocurrency industry continues to evolve, accounting professors will likely play an important role in developing accounting practices and standards that can help ensure the transparency and accuracy of cryptocurrency transactions (Ammous, 2018).

Our initial step in designing our interviews was to ascertain whether the professors had accounting competence. Overall, 62% of respondents provided concrete examples of their professor's superior accounting knowledge, indicating students' confidence in assessing their professor's accounting knowledge and experience. According to the respondents, accounting lecturers were mostly CPA graduates who worked in major accounting firms. These skills and experiences aided significantly in explaining the accounting topic. The following quotes demonstrate this "discovery" of accounting professors' job skills and backgrounds.

> *"I have a pretty professional faculty to learn from. They know about vast things. They were so easy to approach. I remember three of my accounting professors worked at KPMJ. I think that helped us learn more and better." (P2)*

> *"My lecturers used to offer us significant examples from their past job experience and provide us with difficulties that required us to collaborate to determine a solution [for] customers. I honestly thought this to be very fascinating ... I discovered that I probably want to get further knowledge in this area." (P24)*

> *"Now that I work as an accountant, I think, 'Oh. I completely get all of the instances my instructors illustrated in class, and their expertise has increased my confidence in reaching this point at my present company'". (P7)*

It is crucial to demonstrate that students can assess instructors' knowledge levels to ascertain whether they can judge their understanding of cryptocurrency. The overwhelming majority of our participants were dissatisfied that their accounting instructors had never covered cryptocurrency in class, even though the vast expertise of their accounting professors had benefitted them in general. A few individuals acknowledged that instructors discussed cryptocurrencies but not accounting treatments or auditing cryptos. These views are conveyed in the following quotes:

> *"My instructors used to insist that we must live in the present. So, to live, individuals must learn new things. As a result, they spent time talking about cryptocurrencies but were never about financial treatment". (P15)*

> *"My professors are knowledgeable, but they have never really discussed such topics... I do not recall any of them ever mentioning bitcoins." (P8)*

> *"Cryptocurrency or bitcoin should be taught to students ... Regrettably, our lecturers never fully addressed such issues in class, and the ones who did were against bitcoins." (P17)*

These quotes highlight the variation in the knowledge and abilities of accounting professors. According to the participants, they had a high degree of confidence in their capacity to determine the level of expertise of certain lecturers. The differences between accounting university graduates and college professors regarding their knowledge and skills were not substantial. This diversity of experience of accounting professors is consistent with prior studies (Bhaskar, 1983; Romney, 1983) and demonstrates the profession's willingness to hire academics with diverse skill sets. Another probable explanation is that most accounting professors earned their degrees before cryptocurrencies were introduced, rendering them incapable of educating students.

Research Question 2

Our analysis showed that many participants' professors were concerned about cryptocurrencies and ethics, corresponding to an earlier study (Barth et al., 2020; Vincent & Wilkins, 2020). We inquired about the respondents' and their professors' perspectives on cryptocurrencies to evaluate whether they shared the same perspective. According to most respondents, cryptocurrencies were primarily used for money laundering, illegal currency exchanges and platforms, and underground black markets. As expected, participants whose instructor was opposed to cryptocurrencies were hostile to cryptocurrency investments and transactions. In addition, our findings show that the concerns mentioned during the interview did not stop most accounting graduates from investing in cryptocurrencies. Due to a lack of awareness and ethical challenges, participants were learning more about crypto concerning accounting and audit procedures; they felt that cryptocurrencies would not vanish due to ethical concerns, and as more significant corporations invest in bitcoins. These views are conveyed in the following quotes:

> *"It is well known that drug dealers use cryptocurrencies." (P14)*
>
> *"There are so many issues surrounding bitcoin, take real states in Canada as an example, how international money is being used to legitimate the money". (P4)*
>
> *"I have many concerns about crypto…… drugs being the main reason." (P31)*
>
> *"I do think cryptocurrency is here to stay … If governments issued their cryptocurrency in a few years, we would not see the mess in the market… and illegal activities will disappear." (P22)*
>
> *"I recall my professors talking about bitcoins and how drug dealers are using bitcoin… I feel it is better to be far away for now from bitcoin." (P27)*

Accordingly, our analysis results are consistent with prior studies, which found that government and regulatory bodies are increasingly focusing on the ethical considerations of cryptocurrencies. Unethical conduct, such as market manipulation or fraudulent ICOs, can lead to increased regulation and scrutiny, which can affect the valuation and adoption of cryptocurrencies (Bagus & De la Horra, 2021). In addition, ethics play a critical role in the adoption and valuation of cryptocurrencies. It is important for investors, companies, and regulators to promote ethical practices and hold those who engage in unethical conduct accountable (Dierksmeier & Seele,

2018). This can help build trust, protect the reputation of the industry, and ensure the long-term success of cryptocurrencies.

Research Question 3

Developing accounting books for cryptocurrencies can be a complex task, but it is important for individuals and companies that hold, trade, or mine cryptocurrencies to accurately track and report their cryptocurrency transactions. By doing so, they can comply with tax and regulatory requirements, and make informed decisions about their cryptocurrency holdings (Abayadeera et al., 2016). Therefore, regarding whether accounting textbooks include cryptocurrencies, the students had differing viewpoints. More than half of the respondents said that cryptocurrencies were never discussed in their textbooks. These views are conveyed in the following quotes:

> *"I have never read anything about it in the previous version of books. Probably, the new versions may contain a little information on it." (P41)*

> *"I do not remember having encountered such a subject during my accounting studies in the books. I would remember if I saw it, given that I had reviewed my accounting books while preparing for my CPA." (P52)*

> *"I had never seen it, even when I was studying for my CPA. I went through all my CPA materials and CPA competencies books; I never had the opportunity to read about them… I firmly believed that no textbook stated anything about crypto." (P39)*

The remaining participants reported that the textbook devoted just one page to cryptography without providing examples or problems, or if they did, the examples were not helpful. Students agreed that the textbook's material on intangibles covered cryptocurrency, but according to them, the handling of cryptocurrency in the book was insufficient for the subject, since an increasing number of businesses were embracing cryptocurrencies. These views are conveyed in the following quotes:

> *"I remember that my Intermediate Accounting volume 2 accounting textbook discussed cryptocurrency, but I think it was an introduction page, maybe in a one or two page only and was classified as intangible assets". (P30)*

> *"Since I am investing in crypto, this caught my attention… I think there was one column in one of the chapters." (P9)*

The respondents were able to offer precise justifications for their positions in response to a subsequent inquiry. Their responses centered on crypto as a new problem, indicating that future textbooks would need more resources to accommodate the growing number of crypto investors. Students cited the writers' lack of knowledge regarding cryptocurrency as a contributing factor. These views are conveyed in the following quotes:

> *"I do not believe the textbook included information about bitcoin, which is a new subject. It may take a few years before doing so." (P24)*

> *"I think the book's author has no in-depth knowledge about crypto, so they did not expand on the subject … Remember, it is a very new subject …, and people still test the water." (P29)*

> *"I think if more people and companies invest in crypto, the more demand for information's needed. Which I believe will be in new editions of the accounting textbook". (P51)*

This result indicates a dearth of information available in the textbooks. Whether or not the interviewees stated that the cryptocurrency was discussed in the book, the fact remains that it was barely mentioned, indicating that students are incapable of addressing the accounting treatment of a cryptocurrency. This result contradicts prior studies (Hammond et al., 2015). As a result of their examination of accounting textbooks, which revealed that accounting textbooks are being revised at an accelerating rate and that accounting professors believe the rate of change should be slowed, faculty members who are not textbook authors deem frequent textbook revisions to be of diminishing value.

Research Question 4

Most universities and colleges in Canada provide an accounting co-op designed for students interested in acquiring work experience in accounting firms. Students in accounting must complete one semester of working for a firm to be able to graduate from the program. All participants completed the program in their current or prior place of employment. Participants reported that their work while in school was an entry-level role, and that the training they obtained

was relevant to their daily duties and understanding of the firm structures. Many in-hire positions reported that their training was only related to the new job and did not extend to other areas, such as cryptocurrencies. A few participants indicated that their firm had specialist departments and personnel who dealt with cryptocurrency investment, yet they had no interaction due to the nature of their jobs. These views are conveyed in the following quotes:

> *"I have been investing in cryptocurrency since 2019. Thus, I have become acquainted with it. Nevertheless, I have never been trained at work about classifying crypto." (P11)*

> *"Last year, I started my job as an account receivable clerk. I have been reading much about it since my co-op was mainly about bookkeeping while I was at school … my firm does not deal with crypto; it is a small firm … My supervisor invests in crypto. We sometimes discuss the crypto but not in terms of accounting classification auditing". (P26)*

> *"I was surprised when I learned that we have a specialist in crypto in our firms. Some of our companies invest in crypto … But I rarely see or talk to the people who deal with crypto investors." (P31)*

> *"My work is not related to crypto, and as a result, I have not been informed about it. Even though we have a large number of firms who invest in crypto … our database has information about crypto to read, but it's only accessible for people whose work relates to bitcoin." (P2)*

> *"Since I completed school, I have worked as an auditor at the government agency; so far, I did not have any clients who invested in crypto. Therefore, I never had training. I do not recall anyone at my workplace discussing the crypto … most of them believe it is a scam……but as we provide public service, I think we should know about crypto." (P27)*

Our results supported prior research that documented that graduate students may have a wide range of experiences with cryptocurrencies, depending on their interests and professional goals. Cryptocurrencies are a rapidly evolving field, and graduate students who engage with them may

have the opportunity to gain valuable skills, develop new ideas, and make important contributions to the industry (Hasan et al., 2022).

6. Conclusion

Since cryptocurrency is a relatively new concept in accounting, laws are alarmingly absent. The challenges presented by the SEC in its quest to regulate cryptocurrencies and classify most of them as financial securities put pressure on the international standard to assess its definition of security through the lens of IFRS and offer a more accurate classification of cryptocurrency. Whereas student investors are aware of the underlying principles of cryptocurrency, most graduates with accounting degrees continue to face difficulties due to a lack of knowledge about cryptocurrencies or a lack of resources. We also discovered that recent accounting graduates had only the slightest awareness of cryptocurrencies, likely due to a lack of professors' comprehension of or exposure to the issue. Our primary contribution is to understand whether accounting graduates are prepared to conduct accounting and auditing work regarding cryptocurrencies in the future.

Our analysis showed that several textbooks have been revised and no longer included the appropriate section on cryptocurrencies. Another objection might be made about the instructors' expertise in cryptocurrencies, since the subject was not featured in the textbook and was thus not discussed in class. This is a reasonable point; however, most participants reported that they discussed cryptocurrencies with their professors and either opposed cryptocurrency for ethical reasons or had a limited understanding of it. Several actions can be taken by schools in response to these findings, including collaboration with the CPA, regulators, and academic book authors to provide more resources about cryptocurrencies. Accounting schools should educate academics on cryptocurrencies and encourage instructors to include cryptocurrency-related content in their courses. Furthermore, we suggest that accounting textbooks should contain a section on cryptocurrencies. Students should learn about cryptocurrencies through CPA and Canada's cryptocurrency exams. In addition to developing criteria for evaluating whether cryptocurrencies qualify as securities, IFRS committees should comprehensively examine cryptocurrency classification.

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Table 1. Interviewees

Institution	Interviewee (Participant)	Position	Age	Gender	Academic qualification	Professional qualification	Years of firm experience
College 2	1	A	28	Female	BA		5
University 2	2	A	27	Female	BA		5
University 2	3	A	22	Male	BA		4
University 5	4	A	29	Female	BA		5
College 2	5	A	27	Female	BA		4
University 4	6	A	26	Female	BA		4
College 1	7	A	28	Female	BA		5
College 1	8	A	27	Female	BA		3
University 5	9	SA	33	Male	MA	CPA	5
College 2	10	A	24	Female	BA		4
University 3	11	A	27	Male	BA		3
University 3	12	SA	32	Female	MA	CPA	5
University 3	13	SA	24	Female	BA		2
College 1	14	A	28	Male	BA		5
University 4	15	A	27	Female	BA		3
College 1	16	A	29	Female	BA		5
University 1	17	A	24	Female	BA		2
University 1	18	A	23	Female	BA		1
University 5	19	A	29	Male	BA		5
College 2	20	SA	28	Female	BA		4
University 2	21	A	27	Female	BA		4
University 2	22	SA	29	Female	BA		5
College 1	23	SA	35	Male	MA	CPA	5
University 4	24	SA	29	Female	BA		5
University 3	25	A	24	Female	BA		2
College 1	26	A	26	Female	BA		3
University 5	27	A	22	Male	BA		1
University 3	28	A	28	Female	BA		4
College 1	29	SA	32	Female	MA	CPA	5
University 5	30	SA	27	Male	BA		5
University 1	31	SA	29	Female	MA		5
College 1	32	A	26	Female	BA		4
University 2	33	SA	31	Male	MA	CPA	5
University 4	34	A	29	Female	BA		5
College 1	35	A	26	Female	BA		3
University 1	36	SA	28	Female	MA		5
College 1	37	A	25	Male	BA		3
University 4	38	A	27	Female	BA		5
University 3	39	A	23	Female	BA		2
College 1	40	SA	27	Female	MA		5
University 1	41	SA	29	Female	MA		5
University 2	42	A	27	Female	BA		3
University 4	43	A	26	Male	BA		3
University 4	44	A	26	Female	BA		4
University 3	45	SA	27	Female	BA		5
University 1	46	A	23	Female	BA		1
University 3	47	A	28	Female	BA		5
University 3	48	SA	34	Male	MA	CPA	6
University 2	49	A	28	Female	BA		4
University 4	50	A	23	Female	MA		1
College 1	51	SA	29	Male	BA		5
University 5	52	A	28	Female	BA		4
University 3	53	SA	30	Male	MA	CPA	5

University 2	54	A	22	Female	BA		1
College 2	55	A	24	Female	BA		1
University 1	56	SA	29	Male	MA	CPA	8
University 2	57	A	27	Female	BA		3

Notes: SA – Senior Accountant, A – Accountant, MA – Master's in accounting, BA – Bachelor's in Accounting.

[IRB Portal] Application Exempt "Cryptocurrencies in Accounting School?"

IRB Portal <irb@gcsu.edu>
Mon 03/04/2023 18:49
To: adel almasarwah <adel.almasarwah@gcsu.edu>
Cc: **IRB <irb@gcsu.edu>**

Institutional Review Board

Office of Academic Affairs

irb@gcsu.edu

http://www.gcsu.edu/irb

DATE: 2023-04-03

TO: ADEL ALMASARWAH

FROM: Sallie Coke, Ph.D., Chair of Georgia College Institutional Review Board

PROJECT TITLE: #18860 Cryptocurrencies in Accounting School?

ACTION: DETERMINATION OF EXEMPT STATUS

DECISION DATE: 2023-04-03

REVIEW CATEGORY: Exempt

Thank you for submitting an application to the Georgia College IRB for the above-referenced project. Based on the information you provided in your submission, IRB has determined that your project involving human subjects qualifies for EXEMPT status under 45CFR part 46 commonly known as the Revised Common Rule 2018.

Assignment of exempt status to this project means that this project is exempt from further IRB review. This exempt status is valid unless substantive revisions to the study design occur which would alter the risk to participants. If a substantive change is anticipated, you may submit an extension/modification form detailing these changes. Please consult the GC IRB if you have a question about a potential change to your exempt study.

Please note that all responsibilities required of conducting human subject research still apply to this project. Specifically, the Belmont Report principles of respect for persons, beneficence, and justice apply, and all investigators involved in this project must have and maintain current/valid certification of training with conducting research with human subjects

We will retain a copy of this correspondence within our records.

If you have any questions, please contact irb@gcsu.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Georgia College IRB's records.

Sincerely,

Sallie Coke, Ph.D.

Responses to Editor Comments on "Cryptocurrencies in accounting school?"

I would like to thank you again for your efforts and patience in the fourth-round review.

Editor Comments and Justifications

<1. You need to insert text into the methods section about your ethical procedures. This needs to show that (1) your institutional procedures have been followed and (2) the ethical procedures followed. This helps assure readers that you have been ethical.>

Thank you so much for this valuable comment. We have added a new section explaining my university and ethical procedures.

Affected Sections: Section 4.1. Ethical Procedures.

< 2. You need to upload a formal email from a senior person in your faculty or university which confirms the details you have entered in text form to your previous reply. This helps assure ourselves that proper procedure has been followed.>

Amendment: Thank you. I have uploaded an email from my current university. As my previous university, where I started my project, did not have an IRB committee.

Again, thank you so much for your great and valuable comments. We hope that this time we have provided the information you need to make your final decision.