Research Article

A Qualitative Examination of Female Academics' Awareness of Blockchain Technology

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Absract: This study examines female academics' levels of awareness and perceptions of blockchain technology, as well as how they make sense of this technology within an academic context. Adopting a qualitative phenomenological research design, semi-structured interviews were conducted with ten female academics employed at Isparta University of Applied Sciences and Süleyman Demirel University. The data were analyzed manually in line with the interpretative phenomenological analysis approach; meaningful statements were coded and grouped under sub-themes and broader analytical categories. The findings indicate that participants predominantly associate blockchain technology with security, transparency, data management, and reliable record-keeping systems. Although the overall level of awareness is limited, perceptions of blockchain were found to be mostly positive. Participants considered this technology to offer significant opportunities not only for academic processes but also for areas such as education, healthcare, finance, and trade. However, lack of practical experience, insufficient technical knowledge, and limited digital competencies emerged as key barriers to its wider adoption. The study contributes to the literature by demonstrating that blockchain awareness among female academics is shaped by technological knowledge, disciplinary background, institutional support, and access to digital opportunities.

Anahtar Kelimeler: Blockchain, Female Academics, Digital Awareness, Qualitative Research, Phenomenology
Jel Codes: O33, D83, J16

Kadın Akademisyenlerin Blokzincir Teknolojisine Yönelik Farkındalıklarının Nitel Bir İncelemesi

Öz: Bu çalışma, kadın akademisyenlerin blokzincir teknolojisine yönelik farkındalık düzeylerini, algılarını ve bu teknolojiyi akademik bağlamda nasıl anlamlandırdıklarını incelemektedir. Nitel fenomenolojik desenin benimsendiği araştırmada, Isparta Uygulamalı Bilimler Üniversitesi ve Süleyman Demirel Üniversitesi'nde görev yapan on kadın akademisyenle yarı yapılandırılmış görüşmeler gerçekleştirilmiştir. Elde edilen veriler, yorumlayıcı fenomenolojik analiz yaklaşımı doğrultusunda manuel olarak analiz edilmiş; anlamlı ifadeler kodlanarak alt temalar ve daha geniş analitik kategoriler altında gruplandırılmıştır. Bulgular, katılımcıların blokzincir teknolojisini ağırlıklı olarak güvenlik, şeffaflık, veri yönetimi ve güvenilir kayıt sistemleriyle ilişkilendirdiklerini göstermektedir. Genel farkındalık düzeyi sınırlı olmakla birlikte, blokzincire yönelik algının çoğunlukla olumlu olduğu belirlenmiştir. Katılımcılar, bu teknolojinin akademik süreçlerin yanı sıra eğitim, sağlık, finans ve ticaret gibi alanlarda önemli fırsatlar sunabileceğini düşünmektedir. Buna karşın, uygulamaya yönelik deneyim eksikliği, teknik bilgi yetersizliği ve dijital yetkinliklerdeki sınırlılıklar yaygın benimsemeyi zorlaştıran temel engeller olarak öne çıkmaktadır. Çalışma, kadın akademisyenlerde blokzincir farkındalığının teknolojik bilgi, disipliner arka plan, kurumsal destek ve dijital fırsatlara erişimle şekillendiğini ortaya koyarak literatüre katkı sunmaktadır.

Keywords: Blokzincir, Kadın Akademisyenler, Dijital Farkındalık, Nitel Araştırma, Fenomenoloji
Jel Kodları: O33, D83, J16

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1. Introduction

Rapid advances in digital technologies have fundamentally reshaped information and communication systems, generating significant transformations in education and research practices. Within this broader landscape of digital change, blockchain technology has emerged as one of the most prominent innovations of the contemporary era, primarily due to its emphasis on trust, transparency, traceability, and data integrity (Tapscott & Tapscott, 2016; Swan, 2015). Although blockchain was initially developed to support financial transactions, its application scope has expanded considerably, encompassing diverse domains such as education, healthcare, logistics, public administration, and academic governance (Yli-Huumo et al., 2016).

From a technical perspective, blockchain can be described as a distributed ledger system operating across a decentralized network. Rather than relying on a central authority, this structure enables the secure recording of data in cryptographically linked blocks that are resistant to unauthorized alteration. By facilitating peer-to-peer verification mechanisms, blockchain allows the transfer of information or value without intermediaries, thereby reducing friction and enhancing operational efficiency across multiple sectors, including energy markets, supply chains, intellectual property management, and public services (Niforos et al., 2017). At the core of this system lies distributed ledger technology, which provides a consensus-based validation process through networked computing environments, eliminating the need for centralized oversight in maintaining and updating transactional records (Rennock et al., 2018).

In academic contexts, awareness of blockchain technology is particularly relevant due to its potential to enhance reliability in knowledge production, data sharing, credential verification, and institutional record-keeping. As universities and research institutions increasingly engage in digital transformation initiatives, academics' perceptions and understanding of emerging technologies play a critical role in shaping both individual adoption behaviors and institutional strategies (Grech & Camilleri, 2017; Chen et al., 2018; Ullah et al., 2021). Despite growing interest in blockchain-based applications within higher education, existing research suggests that awareness and conceptual understanding of this technology remain uneven across academic communities.

Moreover, the literature reveals a notable gap regarding gender-focused analyses of blockchain awareness in academia. While previous studies have examined blockchain adoption and perception among students and educators more broadly, studies specifically addressing female academics' awareness levels, attitudes, and experiential engagement with blockchain technologies remain limited. This gap is important because prior technology-adoption research indicates that gender may shape individuals' perceptions, usage patterns, and attitudes toward digital technologies (Gefen & Straub, 1997; Venkatesh & Morris, 2000). Therefore, examining blockchain awareness among female academics can provide a more specific understanding of how emerging technologies are perceived within academic and gendered professional contexts.

Against this backdrop, the present study aims to explore female academics' awareness and perceptions of blockchain technology through a qualitative, phenomenological research design. By foregrounding participants' lived experiences and subjective interpretations, the study seeks to provide an in-depth understanding of how blockchain technology is conceptualized within academic settings. The research was conducted with female academics employed at Isparta University of Applied Sciences and Süleyman Demirel University, both located in the Mediterranean Region of Türkiye. The findings are expected to contribute to the literature by illuminating gender-specific dimensions of blockchain awareness and by offering insights into the potential role of blockchain technology within higher education institutions undergoing digital transformation.

2. Literature Review

In recent years, blockchain technology has gained increasing attention in Türkiye, both within academic circles and in the broader public sphere, largely due to its decentralized architecture and capacity for secure data management. Existing studies conducted in the Turkish context indicate that blockchain has primarily been approached from technical and sector-specific perspectives, particularly in relation to logistics, finance, and supply chain management (Tekin et al., 2020; Bakan & Şekkeli, 2019; Tüfekci & Karahan, 2019; Kardaş, 2019; Atalay, 2018). However, the literature also suggests that research focusing on awareness, perception, and socio-educational dimensions of blockchain technology remains relatively limited, especially within academic environments.

One of the most comprehensive studies examining societal awareness of blockchain and cryptocurrencies in Türkiye was conducted by Paribu & FutureBright Group (2024). Based on a large-scale survey, the report reveals that a substantial segment of the population tends to equate blockchain technology almost exclusively with cryptocurrencies. While general awareness of crypto-assets appears to be relatively high, knowledge regarding the technical infrastructure of blockchain and its non-financial applications remains considerably low. Regulatory uncertainty and security-related concerns were identified as key factors shaping public perceptions, indicating that blockchain is still insufficiently understood at a conceptual level within the Turkish context.

Research focusing on university students presents similar patterns. Bahtiyar et al. (2020) found that although students are familiar with the term "blockchain," their understanding of its operational mechanisms and cross-sectoral applications is limited. Students predominantly associate blockchain with investment-oriented crypto-assets, whereas awareness of applications related to digital identity, supply chain management, healthcare, or public administration remains weak. These findings point to gaps in blockchain-related curricula and educational content within higher education institutions. Supporting this conclusion, Demir et al. (2024) demonstrated that students who actively invest in cryptocurrencies tend to exhibit higher levels of blockchain knowledge; nevertheless, overall awareness across the student population remains at a low-to-moderate level, with uncertainties surrounding security and regulatory frameworks continuing to act as significant barriers.

Beyond the student population, international research has increasingly examined blockchain adoption within academic institutions. Ma et al. (2025), for example, investigated the potential of blockchain technology to modernize services in academic libraries across universities in China. Their findings indicate that factors such as optimism and innovativeness positively influence attitudes toward blockchain adoption, while distrust negatively affects acceptance. Importantly, the study emphasizes that positive attitudes toward blockchain contribute to enhanced information sharing and alignment with digital services, highlighting the need for trust-building mechanisms and targeted awareness initiatives in academic settings.

A bibliometric analysis conducted by Alıcı et al. (2024) further illustrates the thematic orientation of blockchain research in Türkiye. Their findings reveal that existing academic publications are largely concentrated on technical issues, including cryptocurrencies, smart contracts, security protocols, and algorithmic structures. In contrast, studies situated within the social sciences, law, education, and healthcare remain scarce. Although the number of blockchain-related publications has increased since 2017, international visibility and publication in high-impact journals remain limited. The analysis also indicates a low level of international collaboration among Turkish researchers, suggesting that blockchain research in Türkiye is still predominantly embedded within national academic networks.

Bayram & Turan (2023) examined cryptocurrency awareness and attitudes in Türkiye using sentiment analysis and statistical analysis. Although their study does not directly

focus on blockchain awareness in academic contexts, it is relevant because it shows that public familiarity with blockchain-related technologies in Türkiye is largely shaped through cryptocurrency-related perceptions. Their findings also indicate that attitudes toward crypto-assets are influenced by risk perception, financial knowledge, and prior experience. This supports the need to examine blockchain awareness beyond cryptocurrency-centered understandings and within more specific groups such as female academics.

Several studies have addressed blockchain adoption in educational and learning environments more broadly. Ullah et al. (2021), using structural equation modeling, identified perceived usefulness, trust, ease of use, social influence, and attitudes toward technology as key determinants of blockchain adoption in smart learning environments. Their findings underscore the critical role of trust and perceived benefits in shaping users' behavioral intentions, while also highlighting blockchain's potential to enhance data security and transparency in certification and student record systems. Similarly, Chen et al. (2018) emphasized blockchain's applicability in education, particularly in relation to credential verification, secure data sharing, and fraud prevention, framing the technology as a mechanism for improving institutional transparency and academic integrity.

Despite the growing body of international literature, research explicitly addressing gender differences in blockchain awareness and adoption remains limited. Existing technology-adoption studies indicate that gender may influence individuals' perceptions of technology, perceived usefulness, ease of use, and usage intentions (Gefen & Straub, 1997; Venkatesh & Morris, 2000). However, these discussions have rarely been extended to blockchain awareness among female academics, particularly through qualitative research designs. This gap is especially relevant given broader discussions surrounding gender disparities in digital competencies, access to emerging technologies, and participation in technology-driven academic fields.

Overall, the reviewed literature indicates that while blockchain technology has attracted increasing scholarly attention, research in Türkiye remains heavily skewed toward technical and financial dimensions. Studies examining awareness, perception, and gender-specific experiences within academic contexts are scarce. This gap underscores the need for qualitative investigations that explore how female academics perceive and engage with blockchain technology, thereby contributing to a more comprehensive understanding of blockchain adoption within higher education.

3. Methodology

3.1. Research Aim

The primary aim of this study is to explore the levels of awareness and perceptions of blockchain technology among female academics employed at Isparta University of Applied Sciences (ISUBÜ) and Süleyman Demirel University (SDÜ), both located in the Mediterranean Region of Türkiye. Although blockchain technology was initially developed for financial applications, it has increasingly expanded into domains such as education, law, healthcare, and public services, thereby gaining relevance within academic contexts (Tapscott & Tapscott, 2016; Swan, 2015).

Within this framework, the study seeks to capture how academics from different disciplinary backgrounds conceptualize blockchain technology and to determine the extent to which it features in the professional lives and research agendas of female academics. By focusing on this group, the research also aims to contribute to a deeper understanding of the gendered dimensions of digital transformation processes in higher education, as well as the role of interdisciplinary perspectives in shaping technology-related awareness and adoption (Rogers, 2003; Venkatesh et al., 2003).

3.2. Research Design and Study Group

A qualitative research approach was adopted in this study, employing a phenomenological research design. Phenomenology is particularly suitable for

investigating individuals' lived experiences, perceptions, and meaning-making processes related to a specific phenomenon (Creswell, 2013; Yıldırım & Şimşek, 2021). Given that blockchain technology represents a relatively new and abstract concept for many academics, the phenomenological approach enabled an in-depth exploration of how female academics interpret and experience this technology within their professional contexts.

Data were collected through semi-structured interviews, which allow researchers to maintain a consistent thematic focus while also providing participants with sufficient flexibility to elaborate on their personal views and experiences (Patton, 2014). This method facilitated both comparability across interviews and the emergence of rich, detailed narratives regarding blockchain awareness and perceptions.

The study group consists of female academics employed at Isparta University of Applied Sciences (ISUBÜ) and Süleyman Demirel University (SDÜ). The selection of these institutions and participants was influenced by considerations of accessibility and resource constraints. Participants were initially identified using criterion-based purposeful sampling, a technique that involves selecting individuals who meet predefined criteria relevant to the research objectives (Büyüköztürk et al., 2020). Accordingly, female academics from various disciplines—such as engineering, economics, and administrative sciences—who possessed at least a basic level of familiarity with blockchain technology were included in the study.

Due to the absence of a centralized database identifying female academics with blockchain-related knowledge, snowball sampling was also employed (Yağar & Dökme, 2018). Initial participants were asked to recommend other female academics who had an interest in or prior exposure to blockchain technology. Through this process, a total of ten female academics participated in the study. All participants took part voluntarily.

Ethical approval for the research was obtained from the Ethics Committee of Isparta University of Applied Sciences (Approval Date: 09 May 2025; Decision No: E.185992). In accordance with ethical research principles, participants were fully informed about the purpose and procedures of the study, and their informed consent was obtained prior to data collection. To ensure confidentiality and protect participants' identities, pseudonyms were assigned, and all findings were reported using these codes rather than real names. The decision to focus exclusively on female academics was informed by existing research indicating that gender can play a significant role in technology awareness, adoption, and perception (Gefen & Straub, 1997; Venkatesh & Morris, 2000).

Information related to the study group is summarized in Table 1. Participant identities are anonymized, and coded identifiers are used throughout the presentation of findings.

Table 1. Characteristics of the Study Participants

No.	Participant Code	Academic Department	Interview Duration	Interview Date
1	P1	Basic Sciences (Mathematics)	8 min 56 sec	02.06.2025
2	P2	Biomedical Engineering	16 min 19 sec	01.07.2025
3	P3	International Trade	27 min 50 sec	01.07.2025
4	P4	Human Resources Management	16 min 28 sec	09.07.2025
5	P5	Human Resources Management	13 min 02 sec	14.07.2025
6	P6	Banking and Finance	13 min 42 sec	16.07.2025
7	P7	Accounting and Finance	13 min 18 sec	16.07.2025
8	P8	Banking and Finance	5 min 57 sec	27.08.2025
9	P9	Public Finance	5 min 30 sec	27.08.2025
10	P10	Accounting and Finance	11 min 33 sec	27.08.2025

3.3. Data Collection Tools

Semi-structured interviews were used as the primary data collection tool. This technique is characterized by the use of predefined guiding questions while allowing participants to express their perspectives freely and in detail (Patton, 2014). Such flexibility is particularly valuable in phenomenological research, as it supports the collection of subjective and experience-based data (Creswell, 2013).

The interview guide was developed by the researchers in alignment with the study's objectives and focused on three main areas: participants' knowledge of blockchain technology, their perceptions of its potential impact on daily and academic life, and their views on strategies for increasing blockchain awareness among female academics. The core interview questions included:

1. What do you know about blockchain technology?
2. In what ways do you think blockchain technology may influence daily life?
3. What strategies could be implemented to increase female academics' engagement with blockchain technology?

Interviews were conducted face-to-face at times convenient for the participants. With their consent, all interviews were audio-recorded and subsequently transcribed verbatim. Transcription enabled a more detailed and systematic analysis of the data and helped ensure accuracy during the interpretation process.

3.4. Data Analysis and Trustworthiness

The qualitative data collected in this study were analyzed using an interpretative phenomenological analysis (IPA) approach (Smith, Flowers & Larkin, 2021). This approach was considered appropriate because the study aimed to understand how female academics make sense of blockchain technology through their own experiences, perceptions, and meanings.

After the interviews were completed, all audio recordings were transcribed verbatim by the researcher. To reduce transcription errors, the recordings and written transcripts were also reviewed by an external peer. The analysis was conducted manually rather than through qualitative data analysis software. This choice was made because the dataset consisted of ten semi-structured interviews and allowed the researcher to remain closely engaged with the participants' narratives throughout the coding and interpretation process.

The analysis followed several systematic stages. First, the interview transcripts were read repeatedly to gain familiarity with the data. Second, meaningful statements related to blockchain awareness, perceived uses of blockchain technology, and strategies for increasing female academics' engagement with the topic were identified. Third, these meaningful statements were assigned initial codes. Fourth, similar codes were compared and grouped into sub-themes. Finally, related sub-themes were organized under broader themes that reflected the main dimensions of participants' awareness and perceptions.

The generation of themes was based on three criteria: the recurrence of similar meanings across participants' statements, the relevance of the codes to the research questions, and the conceptual coherence between codes, sub-themes, and main themes. In this process, the themes were not predetermined; rather, they emerged inductively from the interview data. However, the interpretation of the themes was also informed by the study's broader conceptual focus on digital awareness, technology adoption, and gendered experiences in academic contexts.

In qualitative research, the concepts of validity and reliability are addressed differently from quantitative research. According to Guba & Lincoln (1994), the rigor of qualitative studies can be evaluated through the criteria of credibility, transferability, dependability, and confirmability. In line with this framework, the present study employed two of the eight validation strategies proposed by Creswell (2013): peer review and the clarification of researcher bias.

Credibility was supported through peer review and expert feedback during the coding and analysis process. Transferability was strengthened by providing detailed information about the study group, participant characteristics, interview process, and research context. Dependability was addressed by following a transparent and systematic coding procedure. Confirmability was supported through researcher reflexivity. In this regard, the researcher explicitly acknowledged her assumptions and potential biases in order to minimize subjectivity during the interpretation of the data.

The researcher's potential biases may be summarized in two main points: first, her academic background is mainly concentrated in the field of finance and banking; second, she is also a female academic. Making these positional factors explicit contributed to a more reflexive interpretation of the data. In addition, an academic experienced in qualitative research reviewed the coding and analysis processes. This expert feedback helped refine the relationships between codes, sub-themes, and main themes, while also strengthening the validity and reliability of the study by ensuring that participants' experiences and perceptions were represented in a more systematic and in-depth manner (Creswell, 2013).

4. Findings

The analysis of the interview data revealed that female academics' awareness and perceptions of blockchain technology are shaped around three main analytical dimensions: conceptual understanding, perceived areas of application, and strategies for developing awareness and engagement. Rather than representing independent categories, these dimensions demonstrate how participants make sense of blockchain technology at different levels.

During the analysis process, participants' statements were first coded according to shared meanings. Similar codes were then grouped under sub-themes, and these sub-themes were subsequently associated with broader main themes. The resulting codes reflect female academics' levels of knowledge about blockchain technology, their perceptions, their evaluations of its areas of application, and their suggestions for increasing academic interest in this field.

The main themes and sub-themes were identified inductively based on participants' responses, thereby allowing the findings to be presented in a systematic manner. In this regard, the findings not only reveal participants' current awareness of blockchain technology, but also point to the support, training, and institutional guidance considered necessary for enabling female academics to engage more actively with this technology.

4.1. Identification of Shared Codes

In line with the research questions, the shared codes identified through the analysis were grouped into three main categories:

- Female academics' level of knowledge regarding blockchain technology,
- Perceptions of the ways in which blockchain technology may influence everyday life, and
- Approaches to developing awareness and interest in the topic.

Participants' responses varied across these categories. Some participants described blockchain as an innovative and transformative technology with academic and professional potential, whereas others emphasized uncertainty, lack of knowledge, and limited practical experience. This contrast suggests that female academics' awareness of blockchain technology is shaped by both positive expectations and perceived barriers.

An overview of the shared codes identified in the analysis is presented in Figure 1.

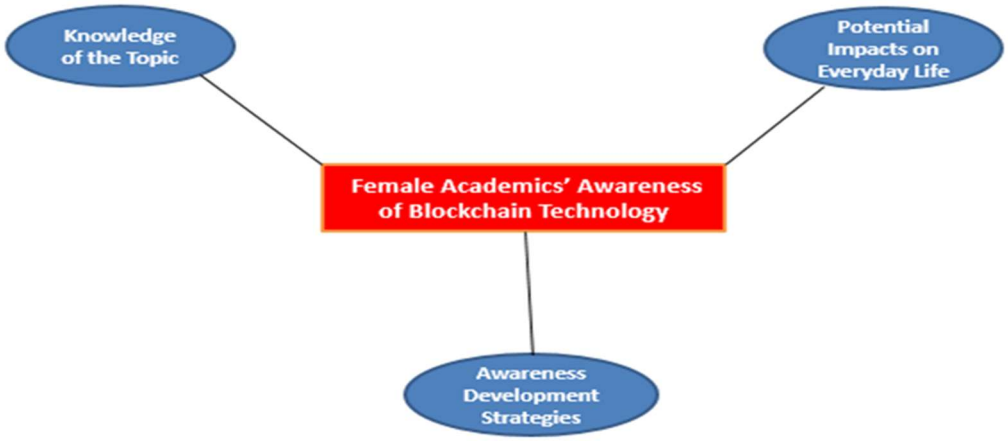


Figure 1. Shared Codes

As illustrated in Figure 1, the themes that emerged in response to the shared code "knowledge of the topic" were grouped into four main categories: software, programming and encryption, data and database structures, blockchain systems, and information security and rights. With regard to the second shared code, "the ways in which blockchain technology may influence everyday life," participants' responses were organized under five themes: commerce and logistics, healthcare systems, gender equality, finance and the economic domain, and banking.

In addition, themes related to the final shared code, "developing awareness of blockchain technology," were identified as social issues, commercial career opportunities, employment prospects, creating distinction, reducing the workload of female academics, and success stories. Participants' views regarding the themes and sub-themes identified under each shared code are presented under separate subheadings.

Female Academics' Level of Knowledge of Blockchain Technology

Among the shared codes presented in Figure 1, the category "level of knowledge about the topic" was organized into four main themes: software, programming and encryption, data and database structures, blockchain systems, and information security and rights. Findings related to each of these themes are discussed in detail in this subsection. The main themes and sub-themes identified under the shared code "knowledge of the topic" are collectively presented in Figure 2.

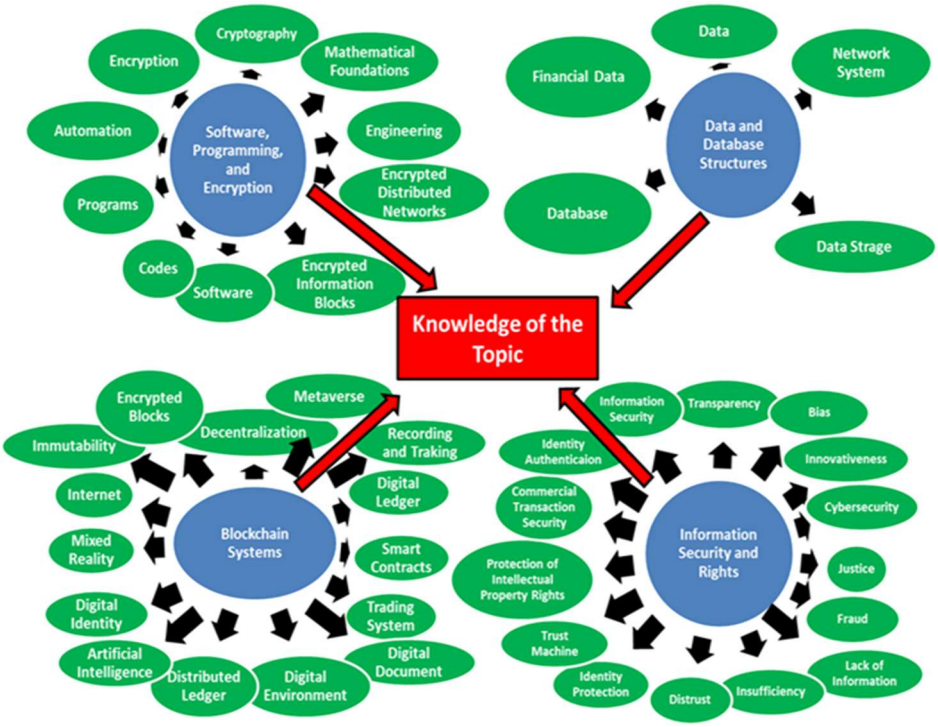


Figure 2. Shared Code, Main Themes, and Sub-Themes

Within the theme Software, Programming, and Encryption, findings were organized into ten sub-themes: cryptography, encryption, mathematical foundations, engineering, encrypted distributed networks, encrypted information blocks, software, codes, programs, and automation. Regarding this theme, Participant P8 described blockchain as "*a database in which information is stored in encrypted blocks on a digital platform*." Similarly, Participant P1 emphasized the mathematical and technical foundations of blockchain, stating that "*blockchain is closely related to cryptology, which is a topic within discrete mathematics. It involves encryption methods and the mathematical infrastructure and equations underlying these processes, and it is used in engineering fields that focus on coding and software*." In addition, Participant P6 associated blockchain primarily with finance and engineering-based applications, noting that "*in finance, especially in the production of cryptocurrencies such as Bitcoin, blockchain operates through decentralized systems, and I tend to think that if one is to use blockchain technology, it requires an engineering background*." By contrast, Participant P2 indicated a more limited conceptualization, stating that "*I have heard the term blockchain, but I mostly associate it with cryptocurrencies.*" Taken together, these perspectives suggest that as participants' disciplinary backgrounds vary, so do their interpretations and definitions of blockchain technology, and no consensus definition emerged among the female academics interviewed. Furthermore, the relatively recent emergence of blockchain technology and its limited diffusion across all academic fields appear to contribute to a generally constrained level of knowledge.

With respect to the theme Data and Database Structures, participants expressed largely convergent views. Participant P10 described blockchain as "*a type of database—essentially a platform where data are recorded,*" while Participant P9 similarly stated, "*I know that it is a database*." Participant P6 noted that "*wherever there is data, blockchain is present,*" and Participant P7 characterized blockchain as "*a shared and networked form of database that differs from conventional databases and is related to data storage.*" These responses indicate a shared understanding among participants that blockchain technology fundamentally relies on data and database structures, suggesting a common perception that the existence and functionality of blockchain are inseparable from data storage and management systems.

Findings related to the Blockchain Systems theme were grouped into fifteen sub-themes: encrypted blocks, decentralization, metaverse, recording and tracking, digital ledger, smart contracts, trade systems, digital documents, digital environments, distributed ledger, artificial intelligence, digital identity, mixed reality, internet, and immutability. Overall, these findings indicate that participants possess a multidimensional awareness of blockchain technology. However, the aspects of blockchain that were most salient tended to align with participants' disciplinary interests or areas of academic engagement. For example, Participant P3 described blockchain primarily as "*a digital ledger,"* emphasizing that "*although blockchain is often associated with Bitcoin, it is essentially a digital ledger in which data are entered and cannot be altered, and its core operational form is based on smart contracts rather than simple transactions.*" Participant P10 similarly highlighted immutability, noting that "*all information and records are stored in a decentralized and distributed ledger structure, and the most important aspect is that records cannot be altered*." In the same vein, Participant P9 described blockchain as "*a digital record-keeping system consisting of sequential blocks in a non-centralized structure,*" while Participant P5 stated that "*since artificial intelligence relies on blockchain infrastructure, and because I use AI tools in my daily life, I believe I use blockchain indirectly, albeit in a limited way*." Other participants framed blockchain in relation to emerging technologies. Participant P1 approached the topic from an artificial intelligence perspective, suggesting that "*the AI models we use to produce tools on the internet must rely on underlying blockchain-based infrastructures.*" Participant P6 emphasized decentralization, describing blockchain as "*a networked system in which data are interconnected through decentralized blocks,*" and further argued that "*decentralized digital currencies may eventually replace physical money*." Participant P4 focused on blockchain's relationship with the metaverse, explaining that "*as we increasingly integrate technologies such as metaverse platforms into education, where students and instructors interact through avatars, blockchain constitutes the underlying infrastructure of these environments.*" Meanwhile, Participant P7 linked blockchain to accounting practices, suggesting that "*the accounting profession will increasingly shift from manual processes to fully digital systems based on blockchain networks.*" As previously noted, these variations demonstrate that female academics' perceptions of blockchain technology differ according to their disciplinary orientations and professional priorities.

Under the theme Information Security and Rights, findings were categorized into fifteen sub-themes: information security, transparency, bias, innovativeness, cybersecurity, justice, fraud, lack of knowledge, insufficiency, distrust, identity protection, trust machine, protection of intellectual property rights, commercial transaction security, and identity authentication. Regarding this theme, Participant P9 emphasized transparency and efficiency, stating that "*blockchain can increase transparency, reduce transaction costs, and improve speed, while also helping to prevent fraud*." Participant P5 highlighted data reliability, noting that "*blockchain technology can contribute positively in terms of data continuity and trustworthiness.*" Participant P6 and Participant P7 similarly described blockchain as a system that "*provides transparency and a sense of reliability*." Participant P8, however, drew attention to the risks associated with insufficient knowledge, particularly in relation to cryptocurrencies, stating that "*if individuals enter cryptocurrency markets without adequate knowledge, they may fail to achieve the returns they expect or may not use the system efficiently*." Participant P2 emphasized intellectual property concerns in academic contexts, explaining that "*if information security is ensured, academics may feel more comfortable sharing ideas, which could facilitate interdisciplinary collaboration. When ideas are protected through encryption, individuals can confidently assert ownership, preventing misuse and encouraging joint projects.*" This perspective underscores the potential positive implications of blockchain for protecting intellectual property rights and fostering collaboration within academia.

Overall, the findings under this category indicate that female academics' knowledge of blockchain technology is present but uneven and largely shaped by disciplinary background. Participants with closer exposure to technical, financial, or data-related fields

tended to define blockchain through concepts such as encryption, distributed networks, data security, and digital records. In contrast, participants from less technology-oriented fields generally associated blockchain with more familiar examples, particularly cryptocurrencies or database systems. This suggests that awareness of blockchain among female academics is not entirely absent; however, it often remains at a conceptual or associative level rather than reflecting practical or applied experience. Therefore, the findings point to a gap between recognizing blockchain as an important emerging technology and having sufficient technical or experiential knowledge to evaluate its academic and professional uses in depth.

Female Academics' Perceptions of the Potential Impacts of Blockchain Technology on Everyday Life

Based on participants' views, the themes and sub-themes associated with the shared code "potential impacts on everyday life" are collectively presented in Figure 3.

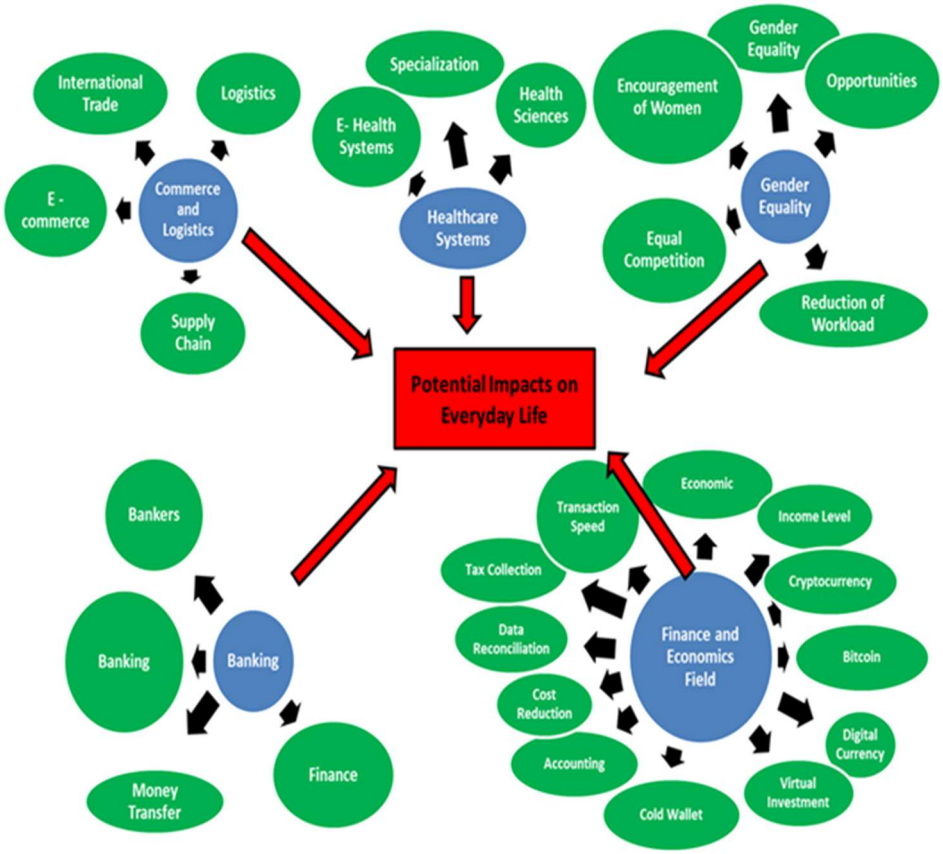


Figure 3. Shared Code, Main Themes, and Sub-Themes

Based on the interviews conducted with the participants, five main themes emerged under the shared code "potential impacts of blockchain technology on everyday life": commerce and logistics, healthcare systems, gender equality, finance and the economic domain, and banking. The sub-themes associated with each main theme are discussed in this section.

Findings related to the Commerce and Logistics theme were organized into four sub-themes: international trade, e-commerce, logistics, and supply chain. With regard to the supply chain, Participant P6 stated that "*I know that operations in supply chains are carried out through blockchain-based systems,*" while Participant P4 described blockchain as "*a system that secures ownership rights and commercial transactions by enabling the recording and tracking of digital assets.*" Similarly, Participant P7 emphasized traceability, noting that "*blockchain is used in logistics; when viewed from production to consumption, the monitoring*

process is essentially based on blockchain infrastructure." Overall, participants' responses indicate that their knowledge within this theme is largely based on general awareness rather than direct experience.

Within the Healthcare Systems theme, findings were grouped into three sub-themes: e-health systems, specialization, and health-related fields. Participant P9 stated that "*I had heard that it is a technology used in health sciences and various related fields,*" while Participant P10 noted that "*blockchain technology may be applied in healthcare, data reconciliation, education, tourism, logistics, and consumption, as many organizations and companies utilize large volumes of data.*" Participant P5 emphasized the role of digital health infrastructures, stating that "*the e-health system currently used in Türkiye stores our personal data.*" These views suggest a shared perception that technology-based applications in healthcare are, or could be, supported by blockchain technology.

Distinct from the themes of commerce, logistics, and healthcare, the Gender Equality theme reflects a more socially grounded perspective and is perceived as having a potentially significant impact on female academics. The sub-themes identified under this category include encouragement of women, gender inequality, opportunities, equal competition, and reduction of workload. Given that gender roles shaped by social norms continue to influence professional experiences, the perspectives of female academics on this theme are particularly noteworthy. In this context, Participant P9 stated, "*I think the acceleration brought by blockchain technology will reduce the workload of female academics, and by working in these areas, they can further develop themselves.*" In contrast, Participant P7 referred to structural barriers such as the "*glass ceiling*" and "*glass cliff,"* arguing that "*even if women achieve technological equality, they may still face negative discrimination due to male-dominated social structures, where men are perceived as more capable of adapting to technology*." Participant P6 adopted a different stance, emphasizing individual choice rather than gender, stating that "*this is a technology that is equally accessible to all users, and any difference depends on whether individuals choose to use it*." Similarly, Participant P1 argued that "*there is no significant gender-based distinction; those who are interested and willing to develop themselves can improve their competencies regardless of gender*." Participant P5, however, highlighted the presence of opportunities within perceived inequalities, stating that "*if women overcome hesitation and recognize these technologies as opportunities, they can transform inequality into advantage. There are numerous national and international funding mechanisms—particularly in advanced R&D—that specifically support women, enabling them to develop projects and access resources*." Collectively, these views indicate that participants perceive blockchain technology as having both positive and negative implications for gender equality within academic contexts.

Under the Finance and the Economic Domain theme, twelve sub-themes were identified: economic aspects, income level, cryptocurrency, Bitcoin, digital currency, virtual investment, cold wallet, accounting, cost reduction, data reconciliation, tax collection, and transaction speed. Participants' perceptions within this theme were largely shaped by associations with cryptocurrencies. Participant P10 stated, "*When we evaluate cryptocurrencies, the bigger picture is blockchain; cryptocurrencies such as Bitcoin represent only one component of this system*." Supporting this view, Participant P7 explained that she actively engages with cryptocurrencies, noting that "*I invest in cryptocurrencies and previously used a cold wallet to enhance security, as the absence of state regulation increases risks such as theft and money laundering*." She also emphasized blockchain's role in accounting systems and its contribution to cost reduction and economic efficiency. Participant P9 linked blockchain to public finance, stating, "*In my field, blockchain can be used in taxation processes, tax collection, and budgeting, particularly to accelerate administrative procedures.*"

Finally, the Banking theme comprised four sub-themes: bankers, finance, banking, and money transfer. Participant P5 emphasized the breadth of blockchain's applications, stating that "*blockchain has a wide range of use cases; although it is often perceived as a digital or software-based system, it is also applicable in healthcare, finance, and education, making it a multidimensional concept.*" Participant P6 similarly highlighted the increasing centrality of

data in financial sectors, noting that "*as the world becomes increasingly data-driven, blockchain will gain prominence across all sectors that rely on large-scale data, particularly in accounting and finance.*" Participant P8 further emphasized that "*the banking, finance, and healthcare sectors are likely to be among those most significantly affected by blockchain technology in the future.*"

Overall, the findings in this category show that female academics perceive blockchain technology as a multidimensional innovation with potential effects across both everyday and professional life. Participants most frequently associated blockchain with sectors that depend heavily on data security, traceability, transaction speed, and institutional trust, such as logistics, healthcare, finance, banking, and public administration. However, their responses also indicate that these perceptions are largely based on general awareness and sectoral expectations rather than direct practical experience. The inclusion of gender equality as a distinct theme further suggests that participants do not evaluate blockchain only as a technical or economic tool, but also as a technology that may influence women's professional participation, workload, and access to emerging digital opportunities. Therefore, this category reveals a dual perception: blockchain is seen as a promising technology for improving efficiency and transparency, yet its potential benefits remain dependent on knowledge, access, institutional support, and inclusive participation.

Awareness Development

Based on the data obtained, the main themes and sub-themes identified under the shared code "awareness development strategies" related to enhancing female academics' awareness of blockchain technology are collectively presented in Figure 4.

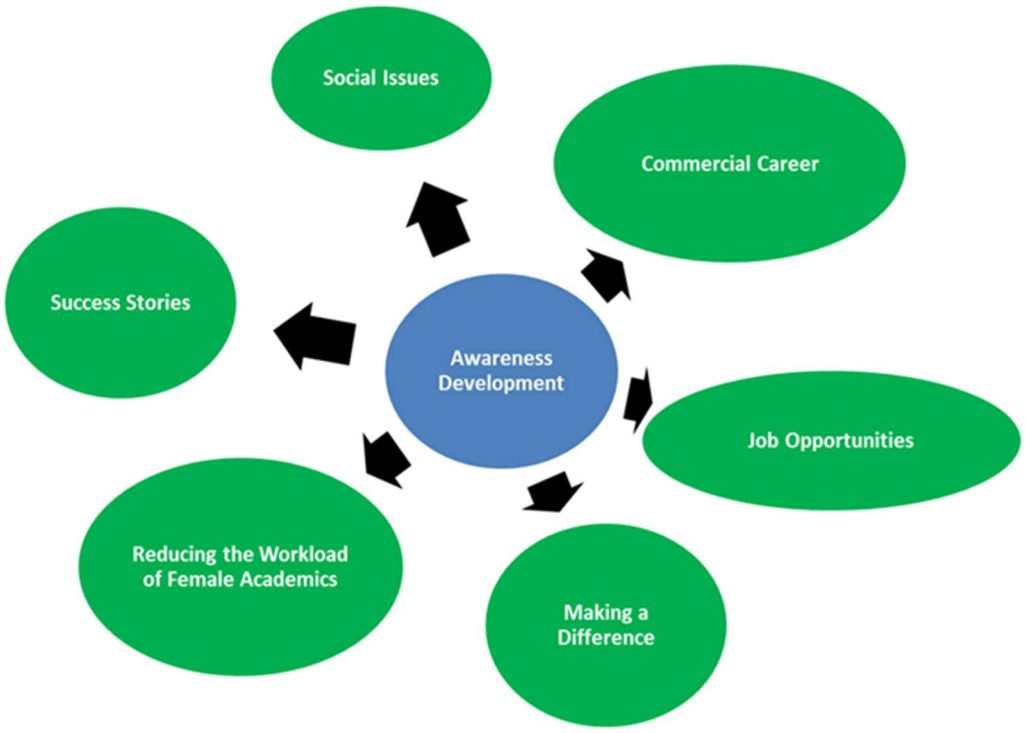


Figure 4. Shared Code, Main Themes, and Sub-Themes

The shared code Awareness Development encompasses female academics' views on how blockchain technology can be utilized within their professional practices or areas of interest, as well as the domains in which its application could be made more effective. In this context, Participant P5 described blockchain as "*a rapidly developing field*" and emphasized that "*its academic contribution can also translate into a commercial career.*" Similarly, Participant P7 framed blockchain as a potential career transition, stating that

"*blockchain technology can be considered as a pathway for career change, particularly in addressing economic, security, and social issues. If we increase awareness and truly understand what blockchain is, we can encourage more women to engage with it. For this purpose, training programs and conferences could be organized.*" Participant P6 highlighted the role of institutional initiatives, noting that "*by organizing more university-based introductory trainings and conferences, blockchain technology can be promoted more widely, enabling female academics to benefit from it and produce academic outputs.*" Along similar lines, Participant P4 stressed the importance of visibility and representation, stating that "*as the number of women active in this field increases and they become more visible, societal acceptance may also increase. As this visibility grows, more women are likely to enter and actively participate in the field. However, this requires preliminary information and foundational training, and at a national level, preparatory infrastructure should be established.*" Participant P8 emphasized the employment potential of blockchain technology, explaining that "*female academics who wish to specialize in this field can receive adequate training and then provide education or courses as experts. In this sense, blockchain can be seen as a new employment opportunity even within academia.*" Participant P5 similarly noted that engaging with blockchain technology may allow academics to differentiate themselves professionally, stating that "*being a sought-after expert does not necessarily mean surpassing others, but rather creating distinction. This field is still very new, and academic studies are limited; therefore, each contribution can serve as guidance for younger scholars and other academics.*" Expanding on this perspective, Participant P5 emphasized the motivational power of success stories, arguing that "*what people want to hear are concrete success narratives—how someone succeeded, developed a blockchain-related project, received funding, or published a Q1 article. If such success stories are shared regionally and matched appropriately with relevant fields, they can significantly enhance awareness.*" This view highlights the importance of role models and tangible outcomes in fostering engagement with emerging technologies.

Finally, Participant P9 approached awareness development from a work–life balance perspective, suggesting that blockchain technology could help reduce the workload of female academics. She noted that "*female academics often carry heavier responsibilities both professionally and in their private lives, particularly when they have children. The acceleration enabled by blockchain technologies may help reduce this burden, allowing women to allocate more time to their academic work and self-development.*" Overall, these findings suggest that awareness development strategies are closely linked not only to professional advancement and technological competence but also to broader issues of visibility, opportunity creation, and the redistribution of academic labor.

Overall, the findings under this category indicate that developing awareness of blockchain technology among female academics requires more than providing technical information. Participants emphasized the importance of training programs, conferences, institutional support, visible role models, and concrete success stories in encouraging women academics to engage more actively with blockchain-related knowledge and research. Their views also suggest that blockchain awareness is closely linked to professional development, career diversification, academic visibility, and access to emerging digital opportunities. At the same time, the emphasis on reducing workload and supporting work–life balance shows that awareness strategies should be designed in a way that considers the specific professional and personal responsibilities experienced by female academics. Therefore, awareness development should be understood not only as a matter of technological literacy, but also as a broader process involving empowerment, institutional inclusion, and equal participation in digital transformation.

5. Conclusion and Discussion

This qualitative study examined the awareness, perceptions, and experiential interpretations of the female academics participating in the study regarding blockchain technology. Based on semi-structured interviews conducted with female academics working at Isparta University of Applied Sciences and Süleyman Demirel University, this

study provides an in-depth understanding of how blockchain technology is understood, evaluated, and meaningfully interpreted within academic and professional contexts.

The findings indicate that female academics have a certain level of awareness of blockchain technology; however, this awareness remains limited in terms of both scope and depth. Participants most frequently associated blockchain technology with cryptocurrencies, encryption, data security, decentralization, transparency, and digital records. This finding is consistent with previous studies showing that blockchain is often understood through cryptocurrency-centered associations and that knowledge of its non-financial applications remains limited (Paribu & FutureBright Group, 2024; Bayram & Turan, 2023; Bahtiyar et al., 2020; Demir et al., 2024). Although participants were able to define blockchain as an important emerging technology, their explanations generally remained at a conceptual or associative level rather than reflecting direct practical experience or technical expertise.

The findings also indicate that blockchain technology is perceived as a technological innovation associated with education, health, finance, logistics, banking, data security, and academic processes. Participants particularly emphasized the importance of secure record systems, transparent transactions, diploma or certificate verification, the protection of academic ideas, and reliable data management. These findings are consistent with studies that address the potential of blockchain in education and smart learning environments, particularly in relation to credential verification, data security, transparency, and trust (Grech & Camilleri, 2017; Chen et al., 2018; Ullah et al., 2021). However, the findings also reveal that participants' positive expectations are accompanied by uncertainty. Limited practical experience, insufficient technical knowledge, lack of institutional guidance, and concerns regarding the complexity of the technology emerge as factors that restrict deeper engagement with blockchain technology in academic contexts.

One of the main contributions of this study is that it approaches the subject from a gender-sensitive perspective. While blockchain research in Türkiye has largely focused on technical, financial, and sectoral dimensions, studies addressing awareness, perception, and gender-specific experiences in academic contexts remain limited (Alıcı et al., 2024). By focusing on female academics, this study shows that blockchain awareness is not merely a matter of technological knowledge, but is also related to professional visibility, access to digital opportunities, academic confidence, workload, and institutional inclusion. Participants regarded blockchain as a field that may create new academic and professional opportunities for women. At the same time, they emphasized that existing inequalities in digital literacy, access to technical training, and participation in technology-oriented fields may limit women's ability to benefit equally from such opportunities.

From a theoretical perspective, the findings indicate that female academics' awareness of blockchain technology cannot be explained solely by their level of technical knowledge. Rather, this awareness is shaped by their general awareness of digital technologies, their tendency to perceive technology as useful and usable, and their academic experiences. Previous technology acceptance studies have similarly shown that gender may influence technology perceptions, perceived usefulness, ease of use, and behavioral intentions to use technology (Gefen & Straub, 1997; Venkatesh & Morris, 2000). However, the present study demonstrates that female academics' relationship with blockchain technology is not limited to perceived usefulness or technological interest alone; it is also shaped by factors such as disciplinary background, professional experience, institutional support, and perceived access to emerging digital fields. Therefore, the adoption of blockchain technology in higher education should be considered not only as a technical process, but also as a social and institutional process that requires inclusive support mechanisms.

These findings also provide important practical implications for the development of blockchain awareness within universities. Universities should not limit blockchain awareness to general information-sharing activities. Instead, they should develop

structured and practice-oriented training programs, interdisciplinary workshops, certificate programs, project-based learning opportunities, and academic collaboration platforms. In addition, increasing the visibility of successful blockchain projects and female role models may encourage female academics to engage more actively with this field. Institutional support is particularly important for transforming blockchain awareness from a conceptual level into applied academic practice.

This study has several limitations. First, the research was conducted with a limited number of female academics working at two universities located in the Mediterranean Region of Türkiye. Therefore, the findings cannot be generalized to all female academics or to all higher education institutions. Second, the study focused on participants who had at least a basic level of familiarity with blockchain technology. Different findings may be obtained from studies conducted with academics who have no prior knowledge of blockchain or with academics who possess advanced technical expertise. Third, the study is limited to interview data based on participants' self-reports; therefore, the findings reflect participants' perceptions rather than observed technology use.

Future studies may broaden the sample by including female academics from different universities, disciplines and geographical regions. Comparative studies may examine whether blockchain awareness differs according to academic field, seniority, digital competence or previous experience with emerging technologies. In addition, longitudinal studies may reveal how blockchain awareness changes over time as universities adopt more digital systems.

In conclusion, this study demonstrates that female academics are not indifferent to blockchain technology; rather, their awareness is emerging, selective, and shaped by both opportunities and barriers. Blockchain is perceived as a promising technology that can strengthen transparency, trust, data security, and academic processes. However, its adoption in higher education remains limited due to technical complexity, lack of experience, and insufficient institutional support. Therefore, strengthening female academics' engagement with blockchain technology requires not only technological training, but also inclusive academic policies, interdisciplinary collaboration, and greater visibility of women in emerging digital fields.

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