

The impact of the COVID-19 pandemic on the use of digital banking among university students in the Czech Republic

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Abstract

Research background: The COVID-19 pandemic accelerated the digital transformation of the banking sector and increased the use of online and mobile banking services. Young clients, particularly university students, represent an important segment due to their high digital literacy. However, research on gender differences in digital banking behavior in Central Europe remains limited.

Purpose of the article: The aim of the article is to identify gender-based differences in university students' attitudes and behaviors toward digital banking in the context of the COVID-19 pandemic. The study focuses on the frequency of mobile banking usage, perceptions of online banking security, awareness of digital services, satisfaction with banking digitalization, and expectations about the future of banking services.

Methods: The empirical study was carried out using an online questionnaire survey administered to 255 university students from 30 higher education institutions in the Czech Republic, including 22 public and 8 private universities. Data were analyzed using descriptive statistics, while the non-parametric Mann–Whitney U test was employed to assess statistically significant gender differences in selected aspects of digital banking usage and perceptions.

Findings & Value added: The results confirm a high level of digital banking usage among students, with mobile applications as the dominant channel. The pandemic primarily accelerated existing digitalization trends. Significant gender differences were identified in mobile banking usage frequency and perceptions of online security, with female students reporting higher usage and more positive security evaluations. No significant gender differences were found in awareness, satisfaction, or future expectations. The study provides empirical evidence on gender-specific digital banking behavior among young clients in Central Europe.

Keywords: digital banking; COVID-19; pandemic; technology; young clients; banking sector

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1. Introduction

The COVID-19 pandemic represented a significant external shock to the global economy, fundamentally affecting the functioning of financial systems and the banking sector. Unlike previous crises, which were predominantly financial in origin, the pandemic emerged outside the financial system, with banks playing a stabilizing role in mitigating its economic consequences (Marcu, 2021; Demirguc-Kunt et al., 2021). The banking sector was compelled to respond to heightened uncertainty, regulatory interventions, and changes in customer behavior, creating pressure for the rapid adaptation of business models and operational processes.

One of the most significant consequences of the pandemic was the acceleration of banking digitalization. Digital technologies became a crucial instrument for ensuring the continuity of banking services during periods of restricted physical contact. Empirical studies confirm that the COVID-19 pandemic acted as a catalyst for digital transformation, as both banks and customers increasingly relied on internet and mobile banking (Naeem and Ozuem, 2021). In many cases, this process resulted in lasting changes in the provision and use of banking services. Empirical evidence further suggests that a higher level of digital financial development contributes to improved liquidity management and greater resilience of the banking sector during periods of economic uncertainty (Hao et al., 2023).

Research based on cross-country data highlights the acceleration of de-branching processes and the shift of banking activities to digital environments. Carbo-Valverde et al. (2024) identify a decline in the importance of branch networks and a growing role of digital channels in terms of customer satisfaction, while Citterio et al. (2024) emphasize that digitalization became a key factor in bank efficiency and competitiveness within the European market during the pandemic. The COVID-19 crisis also significantly influenced customer behavior. Baicu et al. (2020) demonstrate that consumers increasingly preferred digital channels for routine financial transactions during the pandemic, primarily due to limited access to branches, efforts to minimize health risks, and growing trust in digital services. Naeem and Ozuem (2021) further stress the importance of perceived security and reliability of digital platforms in the adoption of online banking under crisis conditions.

From a macroeconomic perspective, the pandemic was also associated with increased systemic risk and volatility in the banking sector (Duan et al., 2021; Demirguc-Kunt et al., 2021). Banks' digital capabilities proved to be an important determinant of their resilience to crisis shocks. At the same time, research indicates that the development of digital finance represents a significant driver of structural economic transformation and enhanced financial system efficiency (Shen et al., 2024). However, banks' ability to respond to crisis conditions was not homogeneous. Citaku et al. (2023) highlight the importance of banks' liquidity positions, which enabled them to better manage operational challenges and continue investing in digital technologies. Taylor (2022) also points to the greater resilience of less risky and more diversified banks during the pandemic period.

Particular attention in the context of banking digitalization should be devoted to young customers, especially university students, who are considered a technologically proficient and innovation-oriented group. Szili et al. (2022) indicate that younger clients' evaluation of banks was strongly influenced by the quality of digital services even prior to the pandemic, a trend that was further reinforced during the crisis. Nevertheless, even among young customers, the need for personal interaction with banks has not completely disappeared, particularly when dealing with more complex financial products (Baicu et al., 2020).

Although the digitalization of banking and the impacts of the COVID-19 pandemic have become subjects of extensive research, empirical studies specifically focused on university students remain limited. Most existing studies rely on aggregated data or broad customer groups without deeper differentiation, which is particularly relevant in the context of Central European countries.

The aim of this paper is to identify gender-based differences in respondents' attitudes and behaviors toward selected aspects of digital banking in the context of the COVID-19 pandemic, based on quantitative data obtained through a questionnaire survey. The questionnaire was

distributed online without restriction to a specific university, and respondents were drawn from various higher education institutions across the Czech Republic.

2. Literature review

The COVID-19 pandemic represented a specific type of crisis for the banking sector, fundamentally different from previous financial shocks. Whereas earlier financial crises originated primarily within the financial system itself, the pandemic emerged as an external public health shock whose economic consequences were transmitted to banking indirectly through declining economic activity, heightened uncertainty, and the deteriorating financial conditions of households and firms (Marcu, 2021). In this context, banks assumed a dual role: on the one hand, they faced increased risks and operational challenges; on the other hand, they were expected to perform a stabilizing function and support the economy by ensuring the smooth functioning of the financial system.

Empirical studies indicate that the pandemic had a significant impact on the performance and stability of the banking sector. Demirguc-Kunt et al. (2021) identify a decline in bank profitability and an increase in credit risk, with the intensity of these effects varying depending on banking system characteristics and macroeconomic conditions. Similarly, Duan et al. (2021) document increased systemic risk and volatility during the pandemic, revealing the vulnerability of the banking sector to global external shocks. These findings suggest that banks' ability to adapt to crisis conditions played a crucial role in mitigating negative outcomes. In addition to pressures on stability and liquidity, the pandemic also affected financial reporting practices. Empirical evidence suggests that some banks engaged in more aggressive earnings management during COVID-19, reflecting heightened pressure to present favorable financial performance amid economic uncertainty (Taylor et al., 2023).

However, the COVID-19 pandemic was not merely a short-term crisis shock; in many cases, it became a catalyst for deeper structural changes within the banking sector. Taylor (2022) shows that banks with more diversified and less risky business models demonstrated greater resilience during the pandemic. These differences were subsequently reflected in banks' ability to invest in technological innovation and respond to changing customer needs. Similarly, Citaku et al. (2023) emphasize the importance of banks' liquidity positions, noting that institutions with sufficient liquid reserves were better able to manage heightened operational and credit risks while maintaining service continuity.

In the European context, Bellucci and Gucciardi (2024) identify the COVID-19 pandemic as a turning point in the evolution of banking activities. The post-pandemic period is characterized not only by higher levels of digitalization but also by structural changes in banking activities and service delivery models. Banks are gradually shifting from traditionally oriented models toward more flexible and technology-intensive solutions, with long-term implications for the functioning of the banking sector and its relationship with customers.

One of the most prominent adaptive mechanisms was the acceleration of digital transformation. Although digitalization in banking was already underway before the pandemic, crisis conditions significantly increased its pace and scope. Restrictions on physical contact, branch closures, and rising customer expectations regarding service accessibility led to increased use of digital banking channels, particularly internet and mobile banking (Naeem and Ozuem, 2021). As a result, digital technologies evolved from a complementary component of banking services into a central pillar of banking operations. This development forms part of a broader transformation often referred to in the literature as the FinTech revolution, which fundamentally reshapes traditional banking business models and the competitive landscape of financial markets (Murinde et al., 2022). Research indicates that FinTech innovations generate measurable economic value, especially in the case of technologies such as blockchain, the Internet of Things (IoT), and robo-advisory services, which are shaping the future of banking (Chen et al., 2019).

From a managerial perspective, digital transformation has come to be understood as a strategic process extending beyond technological innovation. Vives (2019) argues that digital transformation in banking fundamentally alters value creation processes, organizational structures, and relationships between banks and their customers. Empirical evidence further suggests that digitalization during the COVID-19 pandemic was not only a tool for ensuring operational continuity but also had a measurable impact on institutional efficiency. Ghertescu et al. (2024) demonstrate that banks with higher levels of digitalization achieved better performance outcomes in terms of efficiency and adaptability to changing conditions.

Research on digital innovation also highlights the declining importance of traditional distribution channels. Carbo-Valverde et al. (2024) identify a strengthening of the de-branching trend, with customer satisfaction increasingly determined by the quality, usability, and functionality of digital platforms. Digital innovation has thus become not only a cost-reduction mechanism but also a key determinant of competitiveness and market differentiation. From an economic perspective, digital transformation has also proven to be a resilience factor during crisis periods. Citterio et al. (2024) show that banks with higher levels of digitalization performed better during the pandemic and responded more effectively to sudden environmental changes.

The COVID-19 pandemic also significantly influenced customer behavior. Empirical studies confirm that consumers increasingly relied on digital banking services for routine financial transactions during the pandemic (Baicu et al., 2020). This shift was driven by a combination of limited access to physical branches, health concerns, and the growing availability of digital solutions. The pandemic also accelerated digital adoption among customers who had previously used such services only to a limited extent.

Behavioral aspects of digital banking adoption played a crucial role in this process. Naeem and Ozuem (2021) emphasize the importance of trust, perceived security, and service quality in shaping customer attitudes. Although the pandemic increased customers' willingness to use online banking, concerns related to data protection and cybersecurity risks persisted (Baicu et al., 2020). Banks therefore faced the dual challenge of expanding digital offerings while systematically strengthening customer trust through enhanced security measures and transparent communication. In this context, Ghani et al. (2022) highlight perceived usefulness and reliability as key determinants of digital banking effectiveness, suggesting that the pandemic itself may not be the sole driver of adoption.

Changes in customer behavior were also reflected in bank evaluations and selection criteria. Szili et al. (2022) show that digital services gained prominence in customer evaluations during the pandemic, with the quality of digital environments becoming a key determinant of satisfaction. This shift indicates that digital banking is evolving from a short-term crisis response into a permanent strategic component of banking operations.

Building on these studies, it is important to distinguish between the initial adoption of digital banking and its long-term use. Musyaffi et al. (2022) demonstrate that in the post-pandemic period, factors such as technological optimism, discomfort, and uncertainty influence perceived usefulness and ease of use, thereby shaping acceptance. Even after the immediate health risk subsided, customers continued using digital services when they perceived them as practical and reliable solutions for everyday financial needs.

Beyond initial adoption, the continuity of internet banking usage is equally relevant. Rahi et al. (2023) integrate expectation-confirmation theory with self-determination theory and show that continued use of e-banking during the pandemic depends on a combination of cognitive factors (confirmed expectations, perceived usefulness) and motivational factors (intrinsic motivation, perceived autonomy in using digital channels). Their findings extend traditional technology acceptance models by emphasizing that long-term engagement requires more than technical functionality alone.

A specific perspective is offered by studies focusing on university students and Generation Z. Faizuddin and Kamil (2025), using the AHP method, demonstrate that perceived usefulness and

security are the most important determinants of digital banking adoption among university students, while factors such as online responsiveness and trust vary according to gender and education level. Similarly, Addula (2025) identifies perceived usage costs and social influence as key determinants of mobile banking adoption among Generation Z, noting that technological self-efficacy may paradoxically have a negative association with actual adoption if accompanied by concerns about fees or security.

The moderating role of the COVID-19 pandemic in student behavior is illustrated by Pasaribu (2021), who tests the UTAUT2 model among Indonesian students and finds that although the pandemic may not always statistically moderate the relationship between technological factors and behavioral intention, it significantly accelerates the transition toward cashless solutions and strengthens the importance of digital skills. Even prior to the pandemic, Akturan and Tezcan (2012) demonstrated among university students that perceived benefits, social risk, and performance risk significantly shape attitudes toward mobile banking, suggesting that many behavioral mechanisms observed during COVID-19 build upon longer-term trends among young clients.

The pandemic also affected the broader digital payments ecosystem. Kapoor et al. (2022), applying the stimulus–organism–response framework, show that relative advantage, infrastructural conditions, security considerations, and the availability of contactless transactions played significant roles in mobile wallet adoption during the pandemic. These determinants are largely transferable to digital banking, as customers evaluate financial applications based on similar criteria of convenience, security, and perceived value. Fu and Mishra (2022), using global data on financial application usage, document a substantial increase in financial app downloads during lockdowns, particularly for platforms offering simple, reliable, and user-friendly access to financial services.

Recent research also expands traditional technology acceptance models by incorporating new determinants. Lee et al. (2025), in the post-pandemic context of online banking in India, integrate perceived environmental, social, and governance (ESG) performance of banks into the Technology Acceptance Model (TAM), alongside perceived ease of use, accessibility, and system reliability. Their findings suggest that younger customers may increasingly consider value-based and societal aspects when adopting digital banking. Sebayang et al. (2024) further highlight that health risk concerns, trust in digital services, and overall risk perception significantly influenced mobile banking usage during the pandemic, underscoring the complexity of customer decision-making under crisis conditions.

This body of literature provides a theoretical framework for analyzing the behavior of university students in the Czech Republic. Existing research suggests that this group combines high levels of digital competence and openness to innovation with sensitivity to security risks, social influence, and user experience quality. It is therefore important to empirically examine whether findings from other countries and contexts—particularly studies focused on Generation Z and university students—are applicable within the Czech banking market.

Although COVID-19 and banking digitalization have been extensively studied, significant research gaps remain. Most studies focus on macroeconomic impacts, banking stability, or aggregated customer behavior, while detailed analyses of specific customer segments are limited. This is particularly relevant for Central European countries, where digital banking transformation is dynamic but its effects on distinct customer groups remain underexplored. Conducting empirical research focused on university students as a specific customer segment is therefore justified, as their behavior may indicate long-term trends in digital banking. Moreover, the development of the digital economy represents a broader transformative process extending beyond the financial sector and shaping the functioning of modern economies as a whole (Chen et al., 2023).

3. Methodology

The aim of this paper is to identify gender-based differences in respondents' attitudes and behaviors toward selected aspects of digital banking in the context of the COVID-19 pandemic.

The analysis focuses primarily on changes in the frequency and manner of using digital banking services, as well as on students' attitudes toward digital channels compared to in-person interaction with banks during the pandemic. The study seeks to determine whether the COVID-19 pandemic represented a significant stimulus for more intensive use of digital banking within this customer segment and to what extent their preferences regarding banking communication and service delivery have changed.

University students constitute a specific segment of banking clients, largely composed of members of Generation Z. This generation is characterized by a high level of digital literacy, a strong preference for mobile technologies, and expectations of fast and flexible solutions accessible anytime and anywhere, without the need to visit a physical branch (Akturan and Tezcan, 2012; Addula, 2025; Sebayang et al., 2024). For this group, digital channels do not represent merely an alternative to traditional services, but rather the primary mode of interaction with financial institutions.

The empirical part of the paper is based on quantitative research conducted through an online questionnaire survey among university students in the Czech Republic. Data collection took place between March 2025 and April 2025. The questionnaire was distributed via social media platforms, university communication systems, and personal networks. Student organizations and representatives of several higher education institutions were also contacted to support dissemination.

The study successfully involved students from a total of 30 higher education institutions in the Czech Republic, including 22 public universities and 8 private universities. This contributes to greater diversity within the research sample and enhances its explanatory value. Respondents were selected based on availability and voluntary participation, and the questionnaire was not restricted to a specific university or region.

From a methodological perspective, the questionnaire included the following types of variables: (i) nominal variables (e.g., gender, use of specific banking services); (ii) ordinal variables (e.g., frequency of digital banking usage); and (iii) items measured on a five-point Likert scale to assess respondents' attitudes and opinions.

Descriptive statistics were employed to evaluate the collected data, enabling the characterization of the research sample structure and the identification of fundamental trends in respondents' behavior.

Within this study, university students' attitudes were examined with respect to the following questions:

RQ1: How frequently do you use your bank's mobile application (on a smartphone or tablet)?

RQ2: How do you assess the level of security in your primary bank? Do you feel safe when using online banking?

RQ3: Do you feel sufficiently informed about new digital services offered by your primary bank?

RQ4: Are you satisfied with the current level of digitalization of banking services and with the approach of employees in your primary bank?

RQ5: Do you believe that digitalization will completely replace traditional banking services in the future (e.g., closure of branches, absence of face-to-face contact with a banker)?

The article formulates the following statistical hypotheses:

H1: There is no statistically significant difference between male and female respondents in the distribution of responses to RQ1.

H2: There is no statistically significant difference between male and female respondents in the distribution of responses to RQ2.

H3: There is no statistically significant difference between male and female respondents in the distribution of responses to RQ3.

H4: There is no statistically significant difference between male and female respondents in the distribution of responses to RQ4.

H5: There is no statistically significant difference between male and female respondents in the distribution of responses to RQ5.

Based on descriptive statistics and constructed contingency tables, preliminary assumptions regarding gender differences among university students were formulated. To verify these assumptions, the non-parametric Mann–Whitney U test was applied. The results of this test provided the final determination regarding the presence or absence of statistically significant gender differences in the examined aspects according to respondents' gender.

4. Results

The research sample consisted of 255 university students studying in the Czech Republic. In terms of gender distribution, females constituted the majority of respondents, representing 64.3% of the sample (164 respondents). Males accounted for 34.1% (87 respondents), while 1.6% (4 respondents) chose not to disclose their gender.

The age structure indicates a strong concentration in younger age categories. The largest group comprised students aged 18 to 24 years, representing 76.1% of the sample (194 respondents). The second most significant group included respondents aged 25 to 34 years, accounting for 21.2% (54 respondents). Other age categories were only marginally represented, with respondents over 35 years of age comprising less than 3% of the sample, which corresponds to the characteristics of the university student population.

In terms of educational attainment, respondents predominantly reported secondary education with a school-leaving certificate (55.3%), reflecting the fact that a substantial proportion were still pursuing their university studies. A bachelor's degree was reported by 34.5% of respondents, while 7.5% held a master's degree. Higher vocational education accounted for 2.4%, and doctoral or higher education was reported by only 0.4% of respondents.

4.1. Use of digital banking among university students

The survey results confirm a high level of digital banking usage among university students in the Czech Republic, with mobile banking playing a dominant role. Internet banking via a web interface is used daily by 15.3% of respondents and several times per week by an additional 15.3%. Conversely, 27.1% of students reported not using web-based internet banking at all.

In contrast, mobile banking usage is significantly more intensive. A total of 46.3% of respondents reported using mobile banking applications daily, and 43.5% indicated usage several times per week. Only a negligible proportion of respondents reported rare or no use of mobile banking applications. These findings suggest that mobile banking represents the primary digital channel for university students when conducting routine banking operations.

4.2. Perceived impact of the COVID-19 pandemic on customer behavior

Respondents indicated that the COVID-19 pandemic influenced their use of banking services, particularly through the limitation of personal contact with banks and the shift of banking activities to digital environments. Digital banking channels were perceived as practical solutions enabling the execution of financial transactions without the need to visit a physical branch.

At the same time, the impact of the pandemic was not uniform across respondents. While some students reported increased use of digital banking due to pandemic-related restrictions, others indicated minimal behavioral change, as they had already been intensive users of digital services prior to the pandemic. The results therefore suggest that, among university students, the COVID-19 pandemic primarily acted as an accelerator of pre-existing digitalization trends in banking.

The overall structure of the sample corresponds to the target research group—university students as young banking clients with a high level of digital literacy—thus providing a suitable basis for analyzing their behavior in relation to digital banking usage.

To test the formulated hypotheses, contingency tables were first constructed to capture the distribution of responses by gender across the examined questions (RQ1–RQ5). The purpose of this preliminary analysis was to identify potential differences in response structures between male and female respondents prior to statistical testing. The tabular presentation of frequencies enabled a visual assessment of response distributions across Likert scale categories and provided the foundation for the subsequent application of the non-parametric Mann–Whitney U test. The distribution of responses to question RQ1 by gender is presented in Table 1.

Table 1: Respondents' attitudes toward statement RQ1 by gender

Count (RQ1) Responses	Gender Male	Gender Female	Total
1	30	87	117
2	46	63	109
3	8	8	16
4	3	1	4
5	0	5	5
Total respondents	87	164	251

Source: own processing

The distribution of responses indicates a high level of mobile banking application usage among both genders, with the highest frequency categories clearly dominating. However, a difference in response distribution between male and female respondents is observable, as women demonstrate a greater concentration of responses in the higher-frequency usage categories.

These findings suggest a potential gender-based differentiation in the intensity of mobile banking usage.

Table 2: Respondents' attitudes toward statement RQ2 by gender

Count (RQ2) Responses	Gender Male	Gender Female	Total
1	52	71	123
2	30	89	119
3	5	4	9
4	0	0	0
5	0	0	0
Total respondents	87	164	251

Source: own processing

The distribution of responses to question RQ2 by gender is shown in Table 2. The response structure indicates a relatively positive perception of the security level of online banking among respondents. At the same time, slight differences in the distribution of responses between male and female participants can be observed, suggesting variations in the subjective evaluation of digital service security.

The distribution of responses provides a basis for further testing of the statistical significance of these differences.

Table 3: Respondents' attitudes toward statement RQ3 by gender

Count (RQ3) Responses	Gender Male	Gender Female	Total
1	25	39	64
2	40	86	126
3	11	24	35
4	9	15	24
5	2	0	2
Total respondents	87	164	251

Source: own processing

The distribution of responses to question RQ3 by gender is presented in Table 3. The distribution of responses in this area appears relatively balanced between genders, without pronounced extremes in individual categories. Responses are dispersed across multiple levels of the scale, indicating differentiated but not polarized evaluations of perceived awareness.

Preliminary visual analysis of the table does not suggest substantial gender differences.

Table 4: Respondents' attitudes toward statement RQ4 by gender

Count (RQ4) Responses	Gender Male	Gender Female	Total
1	26	49	75
2	50	99	149
3	5	13	18
4	6	2	8
5	0	1	1
Total respondents	87	164	251

Source: own processing

The distribution of responses to question RQ4 by gender is shown in Table 4. The results indicate a predominantly positive evaluation of the current state of digitalization of banking services among both groups of respondents. The distribution of responses is very similar between male and female participants, with the majority of answers concentrated in the middle to positive categories of the scale.

The data structure thus suggests a high degree of homogeneity in attitudes across genders.

Table 5: Respondents' attitudes toward statement RQ5 by gender

Count (RQ5) Responses	Gender Male	Gender Female	Total
1	10	14	24
2	28	65	93
3	10	26	36
4	31	53	84
5	8	6	14
Total respondents	87	164	251

Source: own processing

The distribution of responses to question RQ5 by gender is presented in Table 5. The distribution of responses reflects differentiated attitudes toward the potential complete replacement of traditional banking services by digitalization. Answers are spread across the entire scale, indicating varying expectations regarding the future development of the banking sector. However, no visually identifiable substantial difference in response structure between male and female respondents can be observed. The results of the Mann–Whitney U test for all examined questions are summarized in Table 6.

Table 6: Mann-Whitney U test results

Statement	U	Z	p-value
RQ1	5 804.500	-2.688	0.007
RQ2	6121.000	-2.101	0.036
RQ3	7011.000	-0.243	0.808
RQ4	7035.500	-0.205	0.837
RQ5	6611.500	-1.002	0.316

Source: own processing

To compare male and female responses to RQ1, the non-parametric Mann–Whitney U test was applied. The test results revealed a statistically significant difference between men and women (p-value = 0.007).

The negative Z value (-2.688) indicates that the first compared group (men) achieved lower mean ranks, corresponding to a lower frequency of mobile banking application usage compared to women.

The identified gender-based difference suggests that gender is associated with the frequency of mobile banking application usage. Specifically, women use mobile banking applications more frequently than men. In practical terms, this implies that women may be more active users of digital banking services and may rely more heavily on mobile applications for everyday financial transactions and account monitoring. Based on these findings, hypothesis H1 is rejected. For question RQ2, similar statistical results were obtained. The p-value reached 0.036, indicating a statistically significant difference between male and female respondents in their perception of online banking security.

The negative Z value (-2.101) shows that men achieved lower mean ranks than women. In other words, a lower evaluation of the level of security and perceived safety when using online banking was observed among male respondents. Women perceive the level of security in their primary bank and their sense of safety when using online banking somewhat more positively than men. The identified difference suggests a gender-based variation in the perception of online banking security. Based on the statistical testing, hypothesis H2 is rejected.

For RQ3, no statistically significant difference between male and female respondents was identified, as the p-value exceeded the 0.05 threshold. The Z value (-0.24) is very close to zero, indicating that the difference in the distribution of responses between men and women is negligible.

From a practical perspective, the results suggest that both male and female respondents feel similarly informed about new digital services offered by their primary bank. This may imply that information about new digital services is communicated in a relatively uniform and equally accessible manner to all customers, regardless of gender.

Similar results were obtained for Q4, where the p-value reached 0.837 and the Z value was -0.205. In practical terms, respondents expressed a comparable level of satisfaction with the current state of digitalization of banking services and with the approach of employees in their primary bank, irrespective of gender. Based on these findings, hypotheses H3 and H4 are not rejected.

The final examined question (RQ5) focused on respondents' attitudes toward the future of traditional banking services and their potential replacement by digitalization. The test results did not reveal a statistically significant difference between male and female respondents (p-value = 0.316). As in the previous questions, the Z value was close to zero, indicating that the difference in the distribution of responses between men and women was small and statistically insignificant. Both male and female respondents hold very similar views regarding the future development of banking services in the context of digitalization. In this case, gender does not appear to be a factor that significantly influences expectations concerning the complete replacement of traditional banking services by digital alternatives. Based on these findings, it can be concluded that perceptions of the future of banking are relatively homogeneous across genders, and hypothesis H5 is not rejected.

The results of the above analyses suggest that gender plays a role only in selected aspects of digital banking. Statistically significant differences between male and female respondents were identified in questions focusing on the frequency of mobile banking application usage and on the perception of security and safety when using online banking, with women achieving higher evaluations in both cases. In contrast, no statistically significant gender differences were found in questions related to the level of awareness of new digital services, overall satisfaction with the current state of digitalization of banking services, or expectations regarding the future replacement of traditional banking services by digital alternatives.

Overall, it can be concluded that although certain differences in attitudes and behavior according to gender are present in specific areas, these do not represent a comprehensive or

pronounced divergence across all aspects of banking digitalization. The findings indicate that the perception and use of digital banking services are relatively homogeneous in most areas, with differences primarily related to practical usage intensity and subjective evaluations of security.

5. Discussion

The empirical findings confirm that digital banking represents the dominant mode of interaction between university students and the banking sector in the Czech Republic. The results indicate a high level of mobile banking usage, with the bank's mobile application serving as the primary channel for conducting financial transactions for the majority of respondents. This outcome is consistent with international studies identifying mobile banking as the preferred financial management tool among younger generations (Akturan and Tezcan, 2012; Sebayang et al., 2024).

From the perspective of the impact of the COVID-19 pandemic, it can be concluded that the pandemic functioned primarily as an accelerator of pre-existing digitalization trends rather than as a completely new behavioral impulse. While some respondents reported increased use of digital services during the pandemic, many students indicated that they had already been intensive users of digital channels prior to its outbreak. This finding corresponds with Pasaribu (2021), who suggests that the pandemic did not fundamentally alter the core behavioral determinants of mobile banking usage but accelerated the transition toward contactless solutions. Similarly, Fu and Mishra (2022) argue that crisis periods strengthen the adoption of technological solutions, particularly in contexts where users already possess sufficient digital readiness.

Special attention should be devoted to the identified gender differences. Statistically significant differences between male and female respondents were found in the frequency of mobile application usage and in the perception of online banking security. Women reported more frequent use of mobile applications and more positive evaluations of security levels. This result is particularly noteworthy in light of traditional assumptions regarding technological behavior, as the literature often highlights higher levels of technological self-efficacy among men. However, more recent research suggests that gender differences are gradually diminishing within Generation Z, and that the adoption of digital financial tools is increasingly determined by practicality and everyday usability rather than technological orientation alone (Addula, 2025).

The higher frequency of mobile application usage among women may be associated with more intensive monitoring of personal finances or a higher level of daily interaction with banking services. At the same time, the more positive evaluation of security may indicate greater trust in their primary bank or higher satisfaction with implemented security features. This aspect aligns with the findings of Naeem and Ozuem (2021), who emphasize perceived security as a key determinant of digital banking adoption.

In contrast, no statistically significant gender differences were found in relation to awareness of digital services, overall satisfaction with the level of digitalization, or expectations regarding the future replacement of traditional banking services by digital alternatives. These findings suggest that perceptions of broader strategic issues related to digital transformation are relatively homogeneous across genders. This may be interpreted as an expression of generational uniformity in expectations toward the banking sector. University students, predominantly members of Generation Z, expect fast, flexible, and digitally accessible solutions regardless of gender. Generation Z is characterized by a preference for instant access to services, high levels of technological adaptability, and a strong orientation toward mobile solutions available anytime and anywhere (Sebayang et al., 2024; Addula, 2025).

The findings also confirm that the need for personal contact with banks has not entirely disappeared. Although digital channels dominate routine operations, more complex financial decisions may still require personal consultation, consistent with Baicu et al. (2020). Digitalization therefore does not fully replace traditional banking but rather contributes to the emergence of a hybrid service delivery model.

From a practical perspective, the results carry important implications for the banking sector. Banks targeting young clients should prioritize the optimization of mobile applications, enhancement of user-friendliness, and transparent communication of security mechanisms. Digital financial platforms reduce information asymmetry and improve access to financial services, which is particularly relevant for technologically oriented customer groups, including university students (Li et al., 2023). Since gender differences are mainly reflected in usage frequency and perceived security, marketing and communication strategies could be tailored accordingly. At the same time, it is essential to continue developing digital services as the primary distribution channel, as for younger generations they represent a standard rather than an innovation. The findings should, however, be interpreted in light of certain research limitations. The sample consisted exclusively of university students, limiting the generalizability of the results to the broader population of banking clients. Furthermore, data collection was conducted through an online questionnaire, which may have introduced selection bias in favor of more digitally active respondents. Overall, it can be concluded that the COVID-19 pandemic did not trigger a revolutionary shift in the behavior of university students but rather accelerated the ongoing digital transformation of their banking habits. Digitalization has thus become an integral component of everyday financial practice within the young client segment, with gender differences emerging only in specific areas rather than across the entire spectrum of digital banking adoption.

6. Conclusions

The aim of this paper was to identify gender-based differences in respondents' attitudes and behaviors toward selected aspects of digital banking in the context of the COVID-19 pandemic. The empirical findings confirm that digital banking represents the dominant mode of conducting financial transactions within this customer segment, with mobile banking applications playing a central role. The COVID-19 pandemic primarily acted as an accelerator of already existing digitalization trends rather than as a fundamental transformational turning point in the behavior of university students, who were digitally oriented even before its outbreak.

The analysis of gender differences revealed statistically significant differences in the frequency of mobile banking application usage and in the perception of online banking security. Women reported higher levels of mobile application usage and more positive evaluations of security compared to men. In contrast, no significant gender differences were identified regarding awareness of digital services, overall satisfaction with the level of digitalization, or expectations concerning the future development of banking services. These findings suggest that while certain behavioral differences between men and women exist, the perception of broader digitalization trends within the university student generation remains relatively homogeneous.

The results contribute to the existing body of knowledge on the behavior of young banking clients in Central European countries, where empirical research focusing on specific customer segments remains relatively underdeveloped. University students, as members of Generation Z, constitute a segment characterized by high digital literacy, a preference for mobile solutions, and expectations of fast, flexible, and continuously accessible services. For the banking sector, this implies the need for systematic development of digital channels, optimization of mobile applications, and strengthening trust in online security environments. At the same time, the findings indicate that the complete replacement of traditional banking services by digital alternatives is not unequivocal in the short term, as a certain need for personal contact persists, particularly in relation to more complex financial products.

Despite its contributions, the study has several limitations. The sample consisted exclusively of university students, which limits the generalizability of the findings to the broader population of banking clients. Data were collected through an online questionnaire, which may have introduced selection bias in favor of more digitally active respondents. Future research could focus on comparisons across age-differentiated groups, longitudinal monitoring of behavioral

developments, and deeper analysis of factors influencing digital banking adoption, including income level, field of study, and technological self-efficacy.

Overall, it can be concluded that digitalization in banking is a stabilized and natural phenomenon within the young client segment. The COVID-19 pandemic accelerated this process but did not constitute its primary initiator. For banks, the key challenge therefore lies not only in technological innovation but also in building trust, enhancing user-friendliness, and fostering long-term loyalty among this emerging generation of clients.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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Data Availability Statement

The data presented in this study are available on request from the corresponding author.

Conflicts of Interest

The authors declare no conflict of interest.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used ChatGPT to assist with translation and language proofreading. After using this tool, the authors reviewed and edited the content and take full responsibility for the content of the published article.

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