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INFLUENCE OF TAX DIGITALIZATION ON TAX COMPLIANCE IN GHANA: THE MODERATING INFLUENCE OF TAX KNOWLEDGE.

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ABSTRACT: *Recently the Government of Ghana has began implementing digital tools in its tax administration with the view of increasing tax compliance and correct revenue shortfall. The purpose of this study therefore is to examine the influence of tax digitalization on tax compliance in Ghana, with a focus on the moderating role of tax knowledge. Using a quantitative cross sectional research approach, data were collected from 219 taxpayers in Techiman Municipality to assess their perceptions and behaviours regarding tax compliance, the use of digital tax systems, and their knowledge of tax laws and regulations. A regression was run using SPSS statistical software. The findings revealed a general neutrality among respondents concerning their level of tax knowledge (M= 3.34, SD= 0.463), their use of digital platforms for tax preparation and payment (M= 3.43, SD= 0.524), and their compliance with tax obligations (M= 3.06, SD= 0.535). Despite this neutrality, statistical analysis indicated that tax digitalization significantly influences tax compliance (β = .535, CI = .612 - .922). Additionally, tax knowledge was found to have a significant positive effect on tax compliance β = .224, CI = .261 - .746). Importantly, tax knowledge also moderated the relationship between tax digitalization and tax compliance (int_1= .21: p = .002), suggesting that higher levels of tax knowledge enhance the positive impact of digitalization tax on compliance. These findings underscore the importance of strengthening taxpayer education and improving digital infrastructure to boost compliance levels in Ghana's tax system. The findings have important implications for both tax administrators and policymakers. While digitization improves efficiency and accessibility in tax administration, taxpayer education significantly amplifies its effectiveness. Efforts to modernize tax systems must be paired with investments in improving tax literacy, especially among small business owners, low-income earners, and rural populations who may lack formal financial education. Again, the Ghana Revenue Authority (GRA) and local governments should intensify taxpayer education efforts using localized, practical, and accessible communication channels, including radio programs, workshops, and community engagement forums.*

KEYWORDS: Tax compliance, tax knowledge, tax digitalisation.

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INTRODUCTION

For governments in the majority of industrialized and developing nations worldwide, tax money continues to be the primary source of funding. Most government programs are either unable to be implemented or require debt financing if the state revenue objective is not met (Hermanto et al., 2022). For this reason, a nation needs to work toward meeting its tax revenue goal. Value-added tax (VAT), corporate and personal income tax (PIT), and other similar taxes have contributed significantly to Ghana's income from taxes since 2000. However, in more recent years, revenue generation from these taxes has stalled. Compared to 57% in 2000, these three tax forms accounted for approximately 70% of all collections in 2022. The amount of taxes collected by Ghana is minimal when compared to other lower middle-income countries (LMICs). Since the government of Ghana has been dealing with an increasing budget deficit and mounting debt, non-compliance with tax payments is a pressing problem. The country's goal of 18–20% tax to GDP ratio by 2027 may not met be met, which was 13.8% in 2022 and slightly less than 18% in August 2024 (Iddrisu et al., 2023; Ministry of Finance [MoF], 2023). Despite an increase of more than 6% since 2000, the ratio has not significantly increased since then.

In their research, Wahyu and Santoso (2018) elucidate the explanations for taxpayers' failure to fulfill their tax responsibilities, citing the intricate tax administration as a component of the factors. For instance, in order to file their tax returns, taxpayers must stand and wait. Another reason for public failure to comply is the absence of knowledge about tax laws (Agustiningsih, 2016). A large number of enterprises in Ghana are informal, and the informal sector greatly outnumbers the officially recognized taxpayer base in terms of Ghana's financial system. Individuals in the informal sector have not been successfully integrated into the tax system in the nation using conventional enforcement strategies. In 2013, approximately 67.9% of sole proprietorships and 66% of partnership enterprises that are not registered with GRA operated in the informal sector (Integrated Business Establishment Survey, 2013; World Bank, 2020). Due to the presence of sizable informal businesses, tax money is lost, formal businesses face unjust rivalry, and a climate of informality is fostered (Levy 2008; Perry et al. 2007). As part of its reform plan to develop into a top-tier tax administration, the GRA has started a significant digitalization campaign. A fully digital tax system that enables taxpayers to submit and pay their taxes online at any time and from any location in the world is the aim. In the context of the digital economy, the impact of digitalization on tax compliance (TC) is a complex and multifaceted phenomenon (Sadiq, 2021).

According to Night and Bananuka (2019), tax compliance is the practice of filing an annual income tax return, accurately declaring all income that is taxed, and paying all tax debts on time without waiting for additional action from the tax authorities. Khamis and Mastor (2021) distinguish between two categories of TC: technical compliance and administrative compliance. The administrative guidelines ensure the timely submission of tax returns and payment. Meanwhile, the technical specifications of tax laws and regulations determine tax computation and payment (TC). One of the issues that may impede the effectiveness of tax collection is tax compliance. Taxation compliance continues to be a challenge. The readiness of individuals to pay taxes is essential, based on the taxes on income law, which establishes a self-assessment system in an attempt to raise income tax (Iqbal & Sholihin, 2019).

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The majority of the world's industrialized economies have strong tax systems that boost both tax revenue generation and tax compliance rates. For example, as of 2021, 15.98 million of Indonesia's 19.0 million taxpayers were in compliance, accounting for 84.07% of all tax payments (Martini & Mulyati, 2023; Sembiring, 2021). In the majority of African nations, TC is still low despite a variety of tax laws and regulations. In Nigeria, for example, almost 40% of total tax revenue was realized in 2022 (Ogbediga & Oscar, 2023). To improve TC among individuals and business organizations, the GRA in Ghana has put in place a number of initiatives. As part of its restructuring plan to become a top-tier tax administration, the GRA has started a significant digitalization campaign. Even with these initiatives, TC is still difficult in Ghana, especially for SMEs. For example, Ghana's overall tax-to-GDP ratio is still below 18% as of August 2024. This ratio has not increased significantly since 2017, while being more than 6 percentage points higher than it was in 2000.

The International Monetary Fund (IMF) defines the digital economy as any activity that utilizes digital data. To enhance administration and compliance, digitalizing tax systems entails utilizing data analytics, internet-based filing and paying platforms, digital platforms, and other technical instruments (Ihnatišinová, 2021). In the latter part of the 1980s, the USA was among the first countries to use internet-based filing. Several nations, including the UK, Chile, Australia, France, the Netherlands, Finland, Germany, Switzerland, Canada, Italy, India, China, Ireland, Norway, Malaysia, Mexico, Singapore, and Thailand, to name a few, have embraced the internet-based tax structure thus far (Muturi & Kiarie, 2015). Countries in the Organization for Economic Co-operation and Development (OECD) often have business tax on earnings rates above 85% and PIT rates in excess of 70 percent (OECD, 2019). Rwanda, Ethiopia, Uganda, Kenya, and Nigeria, for instance, have used internet-based filing and payment systems (Muturi & Kiarie, 2015). By 2014, 84 nations had entirely embraced electronic taxation, while 53 countries had undergone 70 modifications in the previous five years, either by implementing or improving electronic submissions and payment systems (PwC, 2016). In the meantime, Ghana's 2009 integration of the former tax bureaus into the GRA was carried out with the specific goal of improving and modernizing tax management. The third GRA Strategic Plan was introduced in 2018 and centered on their income mobilization plans for restructuring the GRA. The first objective of Sustainable Development Goal (SDG) 17, which aims to lessen the nation's substantial dependency on foreign aid by increasing its own revenue and enhancing local revenue and additional revenue-generation capacity, and the "Ghana Beyond Aid" initiative served as the basis for the proposed strategy. To modernize the collection of taxes, the program included activities such as automating and integrating ICT into tax collecting. To address this, the Integrated Tax Application and Preparation System (iTAPS), an online submission framework, was launched in 2019. By minimizing in-person interactions between citizens and revenue agencies, the internet-based system aimed to decrease corruption potential while facilitating the filing and payment of income taxes in a simpler, quicker, and more economical manner.

According to Sadiq (2021), the impact of digitalization on TC in the digital economy is a complex and multifaceted phenomenon that necessitates taxpayers having a thorough understanding of the tax digitization system. Simply put, tax knowledge (TK) refers to a taxpayer's comprehension of tax rules and regulations. According to Pratama (2018), TK is the degree of familiarity with fundamental tax ideas, including tax laws and financial information necessary to fulfill taxpayer duties. This is consistent with the attribution theory, which holds that internal factors like comprehension and awareness can influence a taxpayer's ability to

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fulfill their tax obligations and dictate TC behavior. Research has demonstrated that taxpayers' degree of compliance is significantly and favorably influenced by their degree of tax knowledge (Oladipupo & Obazee, 2016; Saad, 2014; Fjeldstad & Heggstad, 2012). Asrinanda (2018) emphasized this by pointing out that ignorance of taxes may inadvertently or purposely promote tax violations. This becomes much more problematic when handling complicated and challenging tax regimes. According to Isbell (2017), many Africans are unaware of the taxes they owe to their governments, resulting in a low level of taxpayer knowledge across the continent. In Nigeria, for example, Saad (2014) discovered that taxpayers lack technical expertise and view the tax system as complicated, which both contribute to their non-compliance behavior. A study of SMEs in Sekondi-Takoradi, Ghana, found that the degree of TK was moderate (Appiah et al., 2024). In addition to noncompliance, a taxpayer who is unfamiliar with the tax system would not know how much they will pay, making them more susceptible to dishonest officials or forcing them to make payments in secret. They may therefore view the tax system as unjust, which undermines the objective of raising domestic tax collection. This evidence suggests that understanding taxpayers is not just necessary for taxpayers but also for citizens.

Small company owners make significant contributions to a nation's tax structure. Ninety percent of registered businesses worldwide are SMEs, while they only make up 5% of all businesses (OECD, 2014). Approximately 70% of Ghana's GDP comes from SMEs, which are crucial to the nation's economic expansion (MoF, 2024). Based on empirical research, small taxpayers' inability to understand taxes is the main reason they fail to fulfill their tax duties (Susyanti, 2019; Inasius, 2018; Manual & Xin, 2016). Research on small taxpayers' awareness and impact on TC is lacking in Ghana (Wahabu, 2017; Danquah & Osei-Assibey, 2016). Given the increasing significance of technological advancements in tax administration, it is imperative that the impact of digitization on TC in Ghana be studied among SMEs. Ghana's burgeoning digital economy prompted the GRA to introduce a digital tax system, although data indicated that the TC setting within the nation was changing (Agyekum, 2023). To learn more about the factors influencing TC among Ghana's SME businesses, several studies have been conducted (Carsamer & Abbam, 2020; Koranteng et al., 2017; Nartey, 2023; Agyekum; Amponsah & Adu, 2017; Baba, 2022; Peprah et al., 2022; Ababio & Mangueye, 2021). The following factors have been identified as influencing TC in Ghana by previous studies: religion and religiosity (Carsamer & Abbam; Zubairu et al., 2025), perception and growth opinions (Koranteng et al., 2017), TC behavior of SMEs (Nartey, 2023), sociodemographic characteristics and economic factors (Amponsah & Adu, 2017; Baba, 2022; Zubairu et al.), and trust (Zubairu et al.) in TC among Ghanaian SMEs. Studies on the relationship between TD and TC have produced conflicting findings, necessitating more research to contribute to the body of knowledge. This research (Sulistyono & Mappanyukki, 2023; Priyanto, 2016; Tambun, Sitorus, & Pramudya, 2020; Night & Bananuka, 2020; Tambun & Muhtiar, 2019), for example, discovered that the tax digitization system had a favorable effect on TC. In contrast, research revealed that the TD system had no effect on TC (Fossung & Chi, 2022; Kiring'a & Jagongo, 2017; Tambun et al., 2019; Suherman, Almunawwaroh, & Marliana, 2015; Etim et al., 2020). Studies on the impact of TK on TC have produced conflicting findings, necessitating more research to shed more light on the relationship. According to earlier research, TK has a good and significant impact on TC (Hassan et al., 2021; Newman et al., 2018; Susyanti & Askandar, 2019; Sari & Rejeki, 2021). Conversely, the research (Ghani et al., 2020; Laura & Akhdi, 2021; Ramadhan et al., 2019) found that TK did not result in a favorable increase in TC. Furthermore, as far as the researcher is aware, no research has been

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done in Ghana on the moderating influence of TK on the link between TD and TC. The study aimed to close this gap by determining the levels of TD, TK, and TC, as well as the moderating influence of TK on the relationship between TD and TC. The study sought to address these null hypothesis:

1. $H_0$1: TD has no influence on TC among SMEs in Ghana.
2. $H_0$2: TK has no influence on TC among SMEs in Ghana.
3. $H_0$3: TK does not moderate the relationship between TD and TC among SMEs in Ghana.

It is essential to comprehend how TK-moderated TD systems impact TC to create efficient tax administration and policy strategies. Additionally, the research will help develop customized interventions to improve compliance. By providing actual data on the effects of digital tax systems mediated by TK on TC and addressing gaps in the existing literature, this study aims to support the development of effective tax policies and administration practices in Ghana.

LITERATURE REVIEW

Theoretical Review

Institutional Theory

Institutional theory studies the effects of official and unofficial rules, customs, and norms on the behaviour of individuals and organizations (McGee, 2011). The impact of social conventions, laws, and regulations on tax compliance in the age of digitization can be explained by this idea. It looks at how digitalization intersects with the institutional processes that are in place now and how it impacts taxpayer compliance. Personality and organizational behaviour are influenced by both official and unofficial regulations, standards, and customs, which can be explained by institutional theory (Sadress et al., 2019). In the age of digitization, the impact of laws, rules, and social standards on taxpayer compliance can be examined using institutional theory. The tax compliance behaviour of taxpayers is significantly influenced by the institutional framework. The internet-based economy has an impact on taxpayer compliance through innovative legal frameworks and digital documentation of laws (Lim, 2011). According to the theory pressure in the society forces people to comply with rules which include complying to tax digitalization. Digitalisation allows revenue agencies to do analysis of to improve data analysis, allows transparency and enforcement and also encourages e filing through social influence. Regulations must evolve by constantly improving methods to align with digitalization and maintain compliance. Harmonizing conventional (legal frameworks) as well as unofficial (social norms) regulations encourages tax compliance, according to the Institutional Theory study on compliance with taxes in the internet-based economy (Bassongui, 2023). Organizational frameworks that foster confidence between taxpayers and tax authorities enhance conformance in the digital era (Fossung & Chi, 2022). The impact of structures on complying with taxes in the digital economy is clarified by institutional theory. Revenue agencies and legislators can develop effective strategies to promote voluntary compliance as well as a tax attitude of compliance in the digital era by comprehending official and unofficial regulations, customs, and practices.

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Theory of Planned Behaviour

The idea of planned behaviour is a well-known social psychology hypothesis that attempts to explain human behaviour (Bobek & Hatfield, 2003). Icek Ajzen (1991) created this idea by refining the theory of rational action that Ajzen and Fishbein (1970) presented as an explanation for the act of consciousness. The theory states that behaviour in society is shape by some factors but the action of individuals depend on their motivation which is determined by their attitude and norms. Furthermore, the aforementioned characteristics are influenced by behavioural, normative, and control views (Ajzen, 2002). The theory of planned behaviour also implies that attitudes toward behaviour and subjective norms, as well as perceived behavioural control, are dependent on beliefs, specifically control beliefs (Saad, 2011). According to Mathieson (1991), control beliefs include the identification of prospects, assets, and competencies as well as the comprehension of their significance in accomplishing goals. A person's abilities, knowledge, and social support all have a significant role in their capacity to regulate their behaviour. Taxpayers' comprehension of and desire to abide by tax regulations are two aspects that influence their compliance with taxes. The model's prediction that non-economic factors like age, perception, and knowledge have a consequential effect on taxpayers' behaviours through the impact they have on rewards and attitudes toward non-compliance makes it significant. With instruction on taxes, a taxpayer learns about their rights, responsibilities, and procedure for payments of taxes, as well as the repercussions of violation (Machogu & Amayi, 2016).

Empirical Review

Tax Digitalization and the Influence on Tax Compliance

The act of incorporating electronic devices and software into different parts of a system or organization to allow for machine learning, better precision, productivity, and availability of operations and services is known as digital transformation (Deloitte, 2015). According to Knebelmann (2022), the terms "digitization" and "digital transformation" represent distinct aspects of integrating technological innovation into a company's operational strategy, making digitalization a multifaceted process. According to Fanea-Ivanovici et al. (2019), digitization is the act of converting data into an electronic form, while digitalization is the use of ICT to change business procedures and services in order to produce better offers. The creation of completely new business models through the use of digital technologies is known as "digital transformation." The broad economic usage of digital tools like the internet and smartphones is referred to as "digitalization."

Ifeyinwa et al. (2023) define electronic taxation (e-taxation) and compliance as the application of digital tools and technological devices to streamline and impose tax-related procedures. The goal of this strategy is to make collecting taxes, submitting reports, and compliance easier for both authorities collecting revenue and taxpayers. In the second half of the 20th century, digital taxation began to take shape. In the 1970s, the United States implemented Electronic Funds Transfer (EFT) structures, which were among the earliest developments in digital taxation worldwide. Taxpayers may utilize all of the facilities offered by the taxing agency using a digital service called a digital tax system, which includes requesting a compliance certification, filing returns, and applying for a personal identification number (Ifeyinwa et al.,2023).

The GRA uses a range of IT tools to enhance its revenue-raising initiatives because it believes that rapid analysis of data is crucial for contemporary tax organizations. Nevertheless, the

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GRA's present technology platforms supporting income tax collecting are deemed to be multifaceted, complicated, and lacking in certain areas, making it impossible to administer taxes effectively (Keen et al., 2019). To assist with the activities of the DTRD, GRA utilizes three distinct frameworks: the GITMIS, ITAPS, and TRIPS.The GRA just launched and encouraged electronic submission and payment in an effort to lower the duration and cost associated with TC. Additionally, GRA has worked to broaden the base of taxpayers, with limited success thus far. By December 31, 2019, there were 3,394,488 individuals identified with Tax Identification Numbers (TINs), up from 1,394,842 during 2019.

Fossung and Chi (2022) investigate Cameroon's digitalization and tax compliance in relation to the impact of digitization on TC. Two hundred internet taxpayers were surveyed using purposive sampling as well as a causal research technique. The Likert scale was used to collect the primary data. Tax compliance is positively and considerably impacted by effort expectancies, reliability, and accessibility when utilizing Partial Least Square-Structural Equation Modeling (PLS-SEM); nevertheless, the cost of the e-tax service has no discernible impact. Effort expectations were somewhat mediated by taxpayers' behavioral intentions. For Cameroonian taxpayers, the authorities should improve the e-tax mechanism's accessibility and usage. Sentanu and Budiartha (2019) claim that operational fines, e-billing, and e-filing have an impact on TC in Badung Regency. Improved TC is necessary to maximize tax opportunities. One hundred taxpayers from the North as well as South Badung KPPs were polled out of 126,477 total. Regulatory penalty considerations depended on tax penalties, infractions, and application, while usability and ease of use were used to evaluate e-filing and e-billing. The study used multiple linear regression to analyze the data. The findings highlight the value of technologically driven reporting of taxes by demonstrating that e-filing, e-billing, and administrative penalties increase TC.

Tax Knowledge and the Influence on Tax Compliance

An essential element that has been noted as a potential predictor of voluntarily complying with taxes is taxpayer knowledge. Knowledge about taxpayers is essential for TC in the internet-driven economy. It assesses the knowledge of taxpayers regarding their tax obligations, freedoms, incentives, and tax structure. In the current digital era, when technology plays a larger role in the handling of taxes and operations, taxpayer awareness is essential for precise documentation and voluntary compliance (Le et al., 2020). Understanding taxpayers promotes voluntarily complying in the internet-driven economy. According to Adhiambo and Theuri (2019), taxpayers are more likely to adhere when they are aware of their tax obligations and the benefits of doing so. A dearth of knowledge regarding tax laws and filing procedures could result in unintentional non-compliance. Tax laws and regulations may alter swiftly in the age of digitization to address emerging issues and opportunities related to digital transactions. Taxpayers can modify their tax operations by being informed of modifications to tax laws, deadlines, and specifications for digital transactions (Nurkhin et al., 2018). Palil and Mustapha's (2010) research linked taxpayer behavior to their understanding of crimes, reimbursements, punitive rights, and charges. According to Fauziati et al. (2020), TK is the overall comprehension of the tax code and its regulations in a particular jurisdiction. In order to achieve compliant behavior, TK is crucial, especially when determining the level of accountability required in an SAS scenario (Kasipillai, 2010). SMEs are thought to be more inclined to act in accordance with tax laws if they are more informed about them. Compared to taxpayers who have decreased financial knowledge, those who possess greater financial knowledge have a higher tax ethic. Lewis, Webley, and Furnham (2012) supported these

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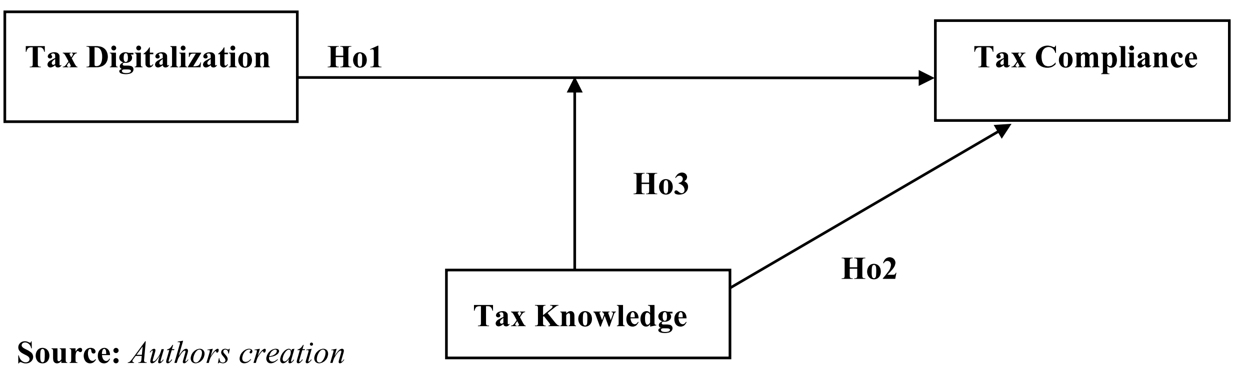
findings by asserting that antagonistic views about taxes are associated with an absence of fiscal awareness and that such opinions can be improved by having an understanding of taxes. Oladipupo and Obazee (2016) assert that as TC increases taxpayers' awareness of their obligations, it is considered a significant factor in voluntarily complying with taxes. According to Baru (2016), one of the key factors influencing SME operators' degree of TC is their degree of tax awareness. Research like Loo (2011) and Chen Loo et al. (2009) has demonstrated that the most significant factor influencing taxpayers' TC is their level of tax awareness. Ritsema et al. (2011) further support this claim by revealing that a sizable portion of SMEs in New Zealand willingly abide by the tax laws and regulations due to their sufficient understanding of the taxation process. Numerous investigations by Kicher (2013) came to the conclusion that knowledge increases compliance.

Most SMEs are unaware of tax laws and thus are not compliant, according to most surveys. Although there is general agreement that TK directly affects TC, some research has shown conflicting findings. For example, voluntary payment of taxes is not much influenced by the presence of tax expertise, as explained by Bird (2013). Maseko (2014) found no connection between voluntary TC and the tax expertise of entrepreneurs with small enterprises, which supports Bird's argument. Furthermore, it is stated that because businesspeople who are aware of tax legislation and procedures can identify ways to reduce their tax liabilities, TK may actually encourage evasion of taxes and failure to comply. In Mauritius, Beeson et al. (2016) evaluated the factors that influence individual taxpayers' TC. To gather data for this research, an initial questionnaire design was used, and thematic statistical computing was used for analysis. The findings of their research indicate that TK has a major impact on TC, while opinions regarding government spending, statutory audits, and fines all affect the degree of compliance. According to the study's findings, taxpayers and tax administrators should work together to reduce non-compliance.

Conceptual Framework

In Figure 1 below, the conceptual framework that connects the different research variables is displayed. The H_01–H_03 illustration shows the aforementioned hypotheses. The influence of TD on TC is shown by the H_01, which indicates that TD does not influence TC. The influence of TK on TC is shown by the H_02, which indicates that TK does not influence TC. The moderation role of TK is shown by the H_03, which indicates that TK moderates the relationship between TD and TC.

Figure 1. Conceptual Framework on the influence of TK and TD on TC, and the moderation role of TK.



Source: *Authors creation*

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METHODOLOGY

Research Design

This study employed a descriptive cross-sectional quantitative design to examine the relationship between TK, TD, and TC among SMEs in Ghana. The population in this study covers all management staff in registered SMEs within the Techiman Municipality of Ghana. The study relied on a target population of 219 SMEs registered by the Ghana Enterprises Agency within the Techiman Municipality (Timothy, 2023). Due to its mid-Ghana location, Techiman was considered appropriate. It draws traders, business owners, particularly small and medium-sized enterprises, as well as additional investors from both Ghana and other countries, especially those in neighboring West African states like Nigeria, Mali, Niger, Burkina Faso, and La Cote d'Ivoire. The consequence is that the municipality is home to a number of SMEs. The author was inspired to choose the municipality for the research endeavor by these characteristics. According to GRA (2014), the city serves as one of Ghana's thriving economic centers and has the capacity to generate a sizable amount of tax income for the state. The research recruited SMEs from the manufacturing, trading, and services sectors. By census, a sample of all 219 registered SMEs in Ghana's Techiman Municipality was taken. To choose important management personnel, such as owners or managers of the chosen SME businesses in the municipality, the study employed a purposive sample technique.

Data and Variable Measurements

The Techiman Municipality of Ghana's SME owners and managers were surveyed to collect statistics. The questionnaire were self-administered to the selected SMEs' managers during their shift and break periods and retrieved them the same day to ensure a 100% return rate. All the 220 owners or managers in the selected SME firms were given a questionnaire, but 219 completed questionnaires, representing a response rate of 99.55%. All ethical protocols, such as the anonymity and confidentiality of the information requested, were assured. Also, written consent was sought from the participants before the questionnaires were issued to them. The questionnaire is comprised of statements that measure the study's constructs, such as tax digitization, tax knowledge, and tax compliance. The foundation for assessing these constructs is the managers' perceptions in the chosen SMEs. Both closed-ended and open-ended questions were used to assess the respondents' demographic characteristics. The study used a five-point Likert scale to assess constructs including TD, TK, and TC. The range of responses is 1 (completely disagree) to 5 (completely agree). The items used to measure the constructs were identical to those used in prior investigations. Thirteen elements that were taken from Night & Bananuka (2020) were used to measure the TC construct. Also, eight items were taken from Night & Bananuka(2020) to measure the construct measuring TD. The instrument developed by Night and Bananuka (2020) was deemed valid and reliable because its total content validity index was 0.857 and all of its variables' Cronbach alpha coefficients were above 0.70. Five items, taken from Poudel (2017), were used to measure the TK construct. The TK questionnaire was deemed credible based on its total Cronbach alpha rating of 0.852.

Despite being standardized, the adopted instrument was not standardized among Ghanaian taxpayers. As a result, the tool underwent several validity and reliability tests with Ghanaian taxpayers and tax authorities. Experts in tax management at GRA guaranteed both face and content validity. Using Cronbach's alpha, a reliability test was performed to ascertain the

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consistency of the questionnaire's items. Internal consistency within the questionnaire was indicated by all Cronbach's alpha scores exceeding 0.7 (Hair et al., 2014).

Analysis Method

Multiple linear regression was adopted to understand the impact of the independent variable on the dependent variable. This analysis was used to determine simultaneously the relationship between TD and TK on TC as well as the variables that have a higher influence on the dependent variable. Additionally, Andrew Hayes process macro was adopted to determine the moderation effect of TK on the relationship between TD and TC.

RESULTS AND DISCUSSION

Descriptive Results on Socio-demographic Characteristics, Tax Digitization, Tax Knowledge, and Tax Compliance

The reliability of the Night and Bananuka (2020), and Poudel (2017) questionnaire were considered satisfactory, as the Cronbach's alpha was >0.7. A total of 219 participants completed the questionnaire.

The results show most (33.3%) of the participants were university graduates. Most (32.0%) were general traders. Twenty-four percent (24%) of the respondents earns between one million (1M) and two million (2M) Ghana cedis. Most (42.0%) make between GH¢2,000.00 and GH¢5,000.00 on sales on monthly basis. Monthly purchases ranged between GH¢2,000.00 and GH¢10,000.00 among most (74.0%) of the participants.

Monthly administrative cost ranged between GH¢5,000.00 and GH¢10,000.00 among most (34.7%) of the participants. Business ownership structure of most of the respondent was sole proprietorship (45.2%). Most (39.7%) of the respondents had their business in operation for between 1 and 5 years. Most (36.5%) of the respondents had between 1 and 9 number of employees. Business location of most (92.2%) of the respondents was urban. Most (76.3%) of the respondents adopt technology for tax preparation. The type of tax paid by majority respondents is Techiman Municipal Assembly (TMA) levy or tax (47.5%). Majority of the respondents had registered with GRA (75.3%) and TMA (69.9%), and keep financial records (78.1%).

Table 1. Tax Knowledge, Tax Digitization, and Tax Compliance of the Respondents.

	M	SD
Tax Knowledge	3.34	0.463
Tax Digitization	3.43	0.524
Tax Compliance	3.06	0.535

Source: *Author's Field Data, 2025*

The descriptive result also revealed that TK variable obtained the mean score of 3.34 (SD= 0.463). This implies that most of the respondents neither agree nor disagree that they have good knowledge on tax laws and regulations. Also, the TD variable obtained the mean score of 3.43 (SD= 0.524). This implies that most of the respondents are neutral about the utilization of tax digital systems in tax preparation and payment. Again, the TC variable obtained the mean score

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of 3.06 (SD= 0.535). This implies that most of the respondents neither agree nor disagree that they comply with tax laws and regulations regarding tax preparation and payment. The result is shown in table 2.

Multiple Linear Regression on Tax Digitization, Tax Knowledge, and Tax Compliance

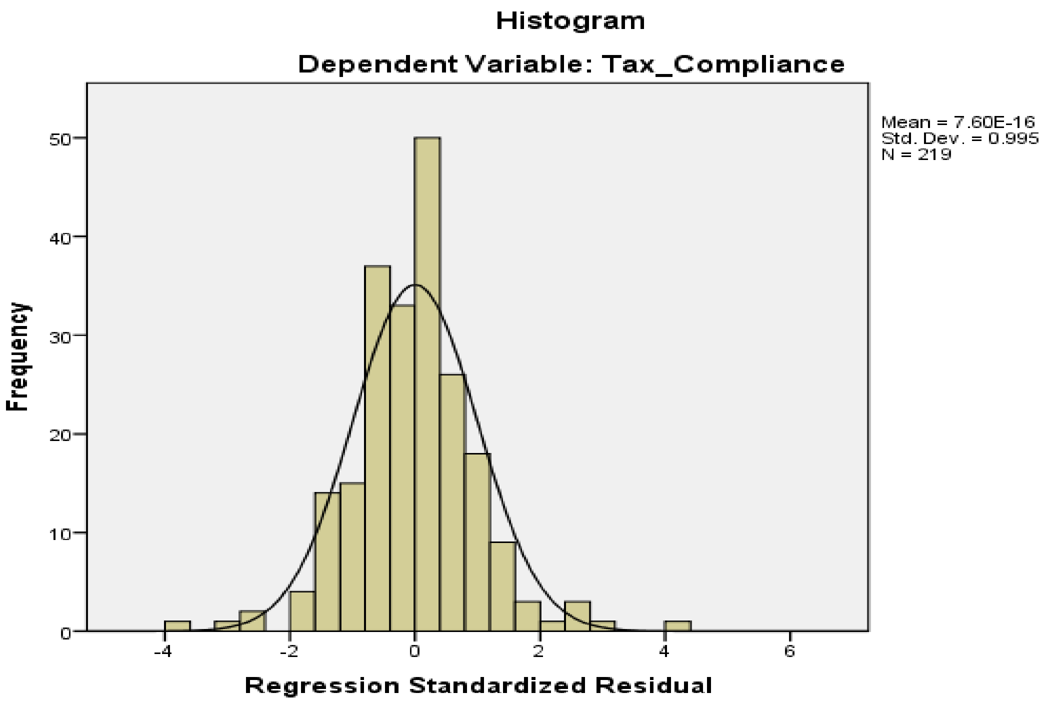
Assumptions of multicollinearity was assessed in the regression analysis. A variance inflation factor (VIF) was conducted to assess the correlation among independent variables that were statistically affecting tax compliance in the regression analysis. Both the VIF and tolerance statistics met the recommended cut-off points of 10 and 0.1, respectively (Table 3). Other assumptions such as outliers, heteroscedasticity, and normality were also assessed in the regression analysis (Figure 2, 3, and 4).

Table 2: Multicollinearity Test

	Tolerance	VIF
Tax Digitization	.991	1.009
Tax Knowledge	.991	1.009

Source: *Author's Field Data, 2025*

Figure 2: Normality test



Since the histogram form in Figure 2 is nearly identical to a bell shape, it can be inferred that the regression graph has a normal distribution shape, indicating that the data has a normal distribution.

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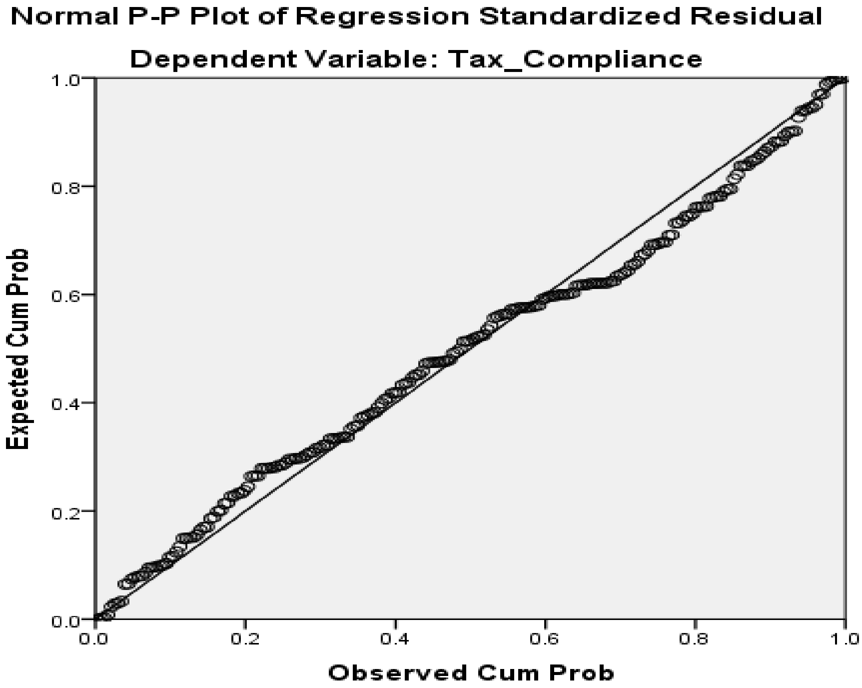
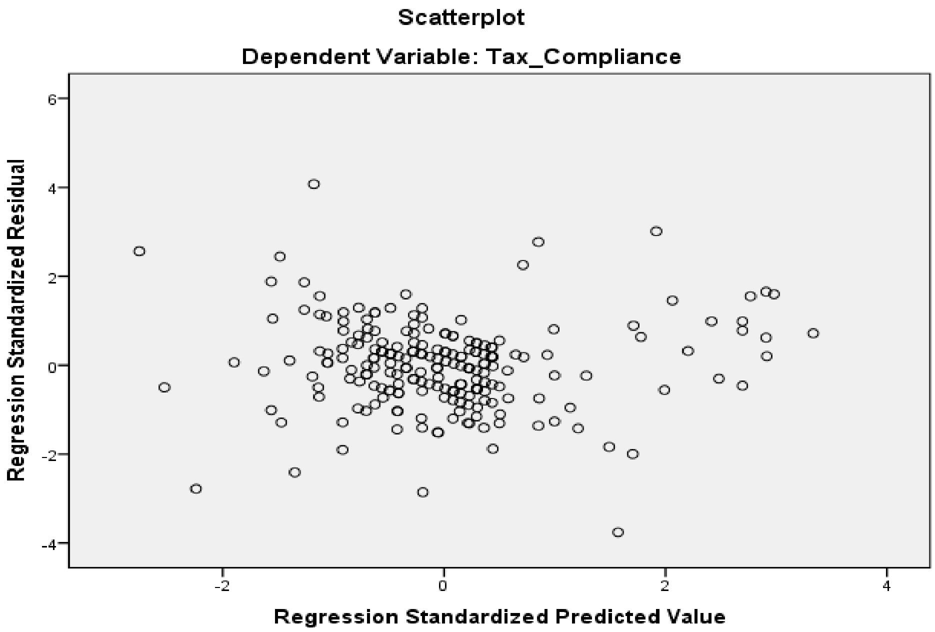
Figure 3: Normality test



A normal distribution of the data and a regression model that satisfies the normality assumption are indicated by the findings in Figure 3, where the points spread out around the diagonal line and follow its direction.

Figure 4: Heteroscedasticity test



The scatterplot graph in Figure 4 displays points that are dispersed at random and situated both above and below the Y-axis value, which is 0. This suggests that heteroscedasticity is absent

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from the regression model. This demonstrates that there is no heteroscedasticity in the regression model.

Multiple Linear Test

Multiple linear regression analysis was conducted to test the effect of tax digitization, and tax knowledge on tax compliance. In the multivariable linear regression coefficient analysis, tax digitization had a significant influence on tax compliance (β = .535, CI = .612 - .922).

Table 3: Multiple Linear Regression on Tax Digitization, Tax Knowledge, and Tax Compliance.

	Unstandardized Coefficients		Standardized Coefficients	P-value	95% Confidence Interval
	B	Std. Error	Beta		
(Constant)	14.783	2.743		<0.001	9.376 - 20.190
Tax Digitization	.767	.078	.535	<0.001	.612 - .922
Tax Knowledge	.503	.123	.224	<0.001	.261 - .746

Source: *Author's Field Data, 2025*

Also, tax knowledge had a significant influence on tax compliance (β = .224, CI = .261 - .746). Therefore, refuting the null hypothesis that that tax knowledge and tax digitization have no influence on tax compliance in taxpayers.

Moderation Analysis on Effect of Tax Knowledge on the Relationship between Tax Digitization and Tax Compliance.

Table 5 presents the results for the moderation analysis on the effect of tax knowledge in the relationship between tax digitization and tax compliance. Tax Digitization had a positive and statistically significant influence in predicting tax compliance (β = .54; $p < .001$).

Table 4: The Moderation Effect of Tax Knowledge on the Influence of Tax Digitization on Tax Compliance.

Pathway	*b*-values	*t*-values	*P*-values	95% CI	
				LL	UL
Direct effects					
Tax Digitization ➔ Tax Compliance	.54	9.78	.001	.61	.92
Tax Knowledge ➔ Tax Compliance	.22	4.09	.001	.26	.75
Interaction effect					
Tax Digitization x Tax Knowledge ➔ Tax Compliance	.21	3.21	.002	.44	.84

Source: *Author's Field Data, 2025* *Notes: LL = Lower limit, UL = Upper limit.*

Tax Knowledge also had a positive and statistically significant influence in predicting tax compliance (β = .22; $p < .001$). The interaction (moderation) effect of tax knowledge in the influence of tax digitization on tax compliance was positive and significant (int_1= .21: $p = .002$). This indicates that tax knowledge moderate the influence of tax digitization on tax compliance in taxpayers thereby refuting the null hypothesis that tax knowledge does not moderate the influence of tax digitization on tax compliance. The results show that when tax

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knowledge was introduced, tax digitization influence the change in tax compliance in taxpayers.

DISCUSSIONS

The current study revealed that taxpayers in the Techiman Municipality of Ghana remained neutral regarding their knowledge of tax laws and regulations. This finding suggests a moderate level of awareness, where taxpayers may possess some basic understanding but lack in-depth knowledge of the tax system. This ambivalence could stem from multiple factors, including limited access to tax-related information, the complexity of tax laws, and inadequacies in tax education programs. One potential explanation for this neutrality is the complexity and technical nature of tax legislation, which can be difficult for ordinary citizens to comprehend without specialized training or assistance. According to Palil (2010), many taxpayers in developing countries face challenges understanding tax systems due to their intricate nature and a lack of simplified information. Similarly, Loo et al. (2009) found that low tax literacy is often associated with tax compliance issues and that many individuals are unsure about their level of knowledge, leading to neutral responses when surveyed. This finding aligns with a study by Atawodi and Ojeka (2012) in Nigeria, where many small business taxpayers expressed uncertainty about their understanding of tax policies, indicating gaps in the dissemination of tax information. Likewise, Agyemang (2012) noted that in Ghana, although awareness of taxes exists, detailed knowledge about specific tax obligations, filing procedures, and legal consequences remains limited among the informal sector. However, this result contrasts with findings from developed countries where taxpayer education programs are more institutionalized. For instance, Kirchler (2007) reported that in Austria and Germany, taxpayers generally agree that they are knowledgeable about tax laws, attributed largely to comprehensive civic education and transparent communication from tax authorities. The implication of this finding is twofold. Firstly, a neutral stance on tax knowledge could lead to unintentional non-compliance. If taxpayers are unsure of their responsibilities or entitlements under tax laws, they may fail to comply, not out of evasion but due to ignorance. Secondly, it highlights the need for targeted taxpayer education.

Again, the current study revealed a neutral attitude among taxpayers in the Techiman Municipality regarding the use of digital tax systems for tax preparation and payment. This neutrality suggests a balance between perceived benefits and concerns, or possibly a general lack of awareness, experience, or trust in these systems. Several underlying factors may explain this finding, as well as variations seen in other studies across different regions. One possible explanation is the level of digital literacy and access to technology in Techiman. While Ghana has made notable strides in expanding ICT infrastructure, disparities persist, particularly in semi-urban and rural areas. Osei-Assibey (2020) notes that many small and medium enterprises (SMEs) still rely on manual tax filing due to limited knowledge and digital skills. In such a context, a neutral stance could reflect uncertainty or unfamiliarity rather than clear support or opposition. Another key factor is the limited exposure to taxpayer education and sensitization campaigns. The Ghana Revenue Authority (GRA) has introduced initiatives such as the Integrated Tax Application and Preparation System (iTaPS), but awareness and training remain uneven. Abdul-Rahaman and Amponsah (2021) emphasize that education significantly influences taxpayer behavior toward digital systems. In Techiman, insufficient outreach could result in limited knowledge and, consequently, neutral perceptions. Trust in digital systems

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also shapes attitudes. If taxpayers perceive government platforms as inefficient, insecure, or not user-friendly, they may hesitate to fully engage with them. Mensah and Boateng (2022) found that perceived risk and distrust in e-government systems are major barriers to adoption in Ghana. These concerns could prevent taxpayers from developing a positive or negative opinion, leading to ambivalence. Interestingly, this finding aligns with similar research in other developing economies. For example, Uchenna and Okafor (2020) found that small business owners in Nigeria expressed indifference toward e-tax systems due to uncertainty about their reliability and value. In Tanzania, Mchomvu (2019) observed a similar neutral stance, which was attributed to inconsistent government communication and lack of digital engagement. However, the finding contrasts with results from more urbanized areas in Ghana, such as Accra and Kumasi, where digital access, higher education levels, and more targeted public campaigns have fostered more positive attitudes. Asare and Frimpong (2020) report that taxpayers in Accra, for instance, viewed e-tax systems as convenient and time-saving, leading to greater acceptance. Several factors may account for the variation in taxpayer attitudes across different regions and studies. Geographic and demographic differences may account for the variation in taxpayer attitudes across different regions and studies. Urban areas tend to have better infrastructure and higher digital exposure compared to semi-urban locations like Techiman. Another reason could be digital literacy and technological access. Regions with limited access to reliable internet, smartphones, or computers, and lower levels of digital literacy, tend to exhibit more ambivalence or resistance (Osei-Assibey, 2020). Also, variations in the GRA's outreach and educational efforts can influence taxpayers' knowledge and confidence in using digital tax tools (Abdul-Rahaman & Amponsah, 2021). Another reason could be the taxpayer's type and business characteristics. Informal and micro-businesses, which are more prevalent in areas like Techiman, may view digital systems as irrelevant or difficult to use compared to larger or urban-based enterprises (Uchenna & Okafor, 2020). Another reason could be cultural and social norms. In some communities, traditional practices and limited openness to digital innovation may result in more cautious or neutral attitudes (Mchomvu, 2019).

Moreover, this study examined taxpayers' attitudes toward compliance with tax laws and regulations in the Techiman Municipality of Ghana and found that respondents generally maintained a neutral stance concerning their adherence to tax preparation and payment obligations. This neutrality implies neither strong compliance nor strong resistance to tax obligations, suggesting an underlying uncertainty, ambivalence, or detachment from the tax system. One plausible explanation for this neutral disposition is the limited level of tax education and awareness among taxpayers. As Atuguba (2006) observed, many Ghanaian taxpayers lack a comprehensive understanding of tax policies and procedures, which may hinder their ability to make informed decisions about compliance. This deficiency in tax knowledge may result in neither active compliance nor deliberate non-compliance, but rather a passive and indifferent attitude. In addition, perceptions of government accountability and the visible benefits of taxation may influence tax morale and, by extension, compliance behavior. Osei and Quartey (2005) highlighted that taxpayers in Ghana often question whether public funds are used effectively. In contexts where the link between tax payment and public service delivery is weak or ambiguous, taxpayers may adopt a neutral stance due to disillusionment or lack of trust in the fiscal system. Administrative inefficiencies within the Ghana Revenue Authority (GRA) may further contribute to this phenomenon. Dziro and Osei-Assibey (2020) noted that bureaucratic challenges, including delays, inadequate taxpayer support, and procedural complexity, diminish the incentives for proactive tax compliance. Such inefficiencies may create a burdensome experience for taxpayers, prompting them to disengage

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from active participation in tax processes. The findings of this study are consistent with those of Torgler (2007), who found that taxpayers in several developing countries exhibit ambivalent attitudes toward compliance due to low levels of institutional trust and weak enforcement. Similarly, Fjeldstad and Heggstad (2012) reported that in East African countries, many citizens display passive or neutral attitudes toward taxation, driven by poor tax morale and limited state-citizen accountability. Contrary to the current findings, other studies have demonstrated higher levels of compliance influenced by positive perceptions of the tax system, perceived fairness, and effective enforcement. For example, Palil and Mustapha (2011) found that in Malaysia, taxpayers' attitudes were significantly shaped by their perception of equity and their understanding of tax laws. Likewise, Kirchler, Hoelzl, and Wahl (2008) argued that voluntary compliance improves when there is a synergistic balance between institutional trust and enforcement capabilities. It is important to recognize that the neutrality observed in Techiman may not be uniformly reflected in other municipalities or regions. Several factors could explain possible variations in findings across different contexts. First, regional differences in institutional efficiency may influence taxpayer behavior. Tax offices in other parts of Ghana may be better resourced and more responsive, leading to higher compliance levels (Dziro & Osei-Assibey, 2020). Conversely, areas with weaker administrative capacity may foster greater ambivalence or resistance to tax obligations. Second, socioeconomic and educational differences could significantly affect tax attitudes. Regions with higher levels of formal education and employment in the formal sector tend to exhibit better tax knowledge and stronger compliance (Palil & Mustapha, 2011; Torgler, 2007). In contrast, areas with low literacy levels and a large informal sector presence, such as parts of Techiman, may exhibit less certainty or interest in engaging with tax systems. Third, the dominance of informal economic activities can shape compliance behavior. In economies where informal employment is prevalent and tax enforcement is inconsistent, taxpayers may feel disconnected from the tax system, resulting in a neutral or passive stance (Joshi, Prichard, & Heady, 2014). Fourth, cultural and social norms influence how individuals perceive tax obligations. Where tax evasion is socially tolerated or perceived as commonplace, individuals may feel less compelled to comply, regardless of enforcement (Kirchler et al., 2008). Such social attitudes could reinforce neutral or indifferent behaviors, especially in closely knit or informal community networks. Finally, differences in perceived legitimacy and trust in government can play a pivotal role in shaping tax attitudes. In regions where government institutions are seen as transparent and service-oriented, taxpayers may be more inclined to comply. Conversely, perceptions of corruption or mismanagement of public resources may fuel taxpayer disengagement (Fjeldstad & Heggstad, 2012). These variations underscore the need for localized assessments of taxpayer attitudes and the development of region-specific tax strategies.

Additionally, the current study found that tax digitization had a significant influence on the tax compliance behavior of taxpayers in the Techiman Municipality. This finding aligns with a growing body of literature that supports the positive role of digital systems in enhancing tax administration and compliance. A major reason for this significant relationship is the increased efficiency and transparency that digitized tax systems introduce into tax processes. Digital platforms reduce human interaction, which often serves as a point for corruption or inefficiencies in tax collection (Okunogbe & Santoro, 2021). In Techiman Municipality, the digitization of tax systems has likely reduced opportunities for tax evasion by increasing traceability and minimizing discretion on the part of tax officers. Moreover, tax digitization simplifies the tax filing process, thereby reducing the compliance burden on taxpayers.

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According to Narayan and Singh (2021), digital tax systems lower the cost and complexity of tax compliance, which in turn motivates taxpayers to comply voluntarily. The availability of online portals, mobile payment platforms, and real-time record-keeping in Techiman may have enabled more accurate and timely filing, enhancing overall compliance. Consistent with this finding, a study by Kira and He (2012) in Tanzania found that e-tax systems significantly improved voluntary tax compliance by improving taxpayer convenience and reducing ambiguity in tax procedures. Similarly, Muita et al. (2020) highlighted that in Kenya, the digitization of tax services led to increased compliance levels, as taxpayers perceived the system to be more user-friendly and less susceptible to manipulation. However, not all studies report similar results. For instance, Fjeldstad et al. (2020) reported that in certain rural and low-income areas of sub-Saharan Africa, tax digitization had minimal impact on compliance due to limited digital literacy and inadequate infrastructure. If such barriers exist in parts of Techiman, they could potentially moderate the effectiveness of digital systems. However, this study's significant impact indicates that the municipality is either effectively managing these barriers or they are not as prominent. Several factors may explain the variations in findings across studies regarding the impact of tax digitization on compliance. One prominent factor is the quality and accessibility of digital infrastructure. In regions with limited internet access or unstable electricity, the functionality of e-tax systems may be compromised. Fjeldstad et al. (2020) noted that inadequate infrastructure in rural areas often renders digital tax platforms ineffective. By contrast, Techiman's urban infrastructure may have supported smoother implementation and usage. The ability of taxpayers to interact with digital platforms is another key determinant. In areas with low ICT literacy, even well-designed tax platforms may be underutilized or misunderstood, reducing their impact (Muita et al., 2020). It is possible that taxpayers in Techiman have benefited from better digital awareness and support services, enhancing the uptake and effectiveness of the systems. Public trust plays a pivotal role in tax compliance. Taxpayers are more likely to respond positively when they perceive digitization as part of a broader government effort to enhance fairness and reduce corruption. In contexts of low institutional trust, however, even digitized systems may be viewed with suspicion (Okunogbe & Santoro, 2021). The scope and design of digital systems could also explain the variance in the findings. The functionality and user experience of tax systems also vary widely. Some implementations may only digitize filing, while others provide full-service platforms including automated calculations, digital audit trails, and online support. The more comprehensive and user-friendly the system, the more likely it is to drive compliance. Differences in system design across countries and municipalities may thus explain divergent findings. Additionally, the socioeconomic characteristics of taxpayers may also account for the variation in the findings. Taxpayer profiles such as education level, income, business size, and sector can affect how digitization impacts compliance. Higher-income or formally registered businesses are typically better equipped to engage with digital systems. In regions with large informal sectors, like parts of rural Africa, these systems may have less reach or impact (Narayan & Singh, 2021).

Again, the present study found that tax knowledge has a significant influence on tax compliance among taxpayers in the Techiman Municipality. This result reinforces the central role of taxpayer education in enhancing voluntary compliance, particularly in decentralized settings where informal economic activity may be prevalent. When individuals possess adequate knowledge about tax laws, procedures, benefits of compliance, and consequences of non-compliance, they are more likely to fulfill their tax obligations willingly. Tax knowledge can reduce uncertainty, demystify complex procedures, and foster a sense of civic responsibility.

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This finding aligns with a body of literature demonstrating a positive relationship between tax knowledge and tax compliance. For example, Palil and Mustapha (2011) concluded that better-informed taxpayers in Malaysia exhibited higher compliance due to increased awareness and understanding of the tax system. Similarly, Saad (2014) found that tax knowledge not only enhanced taxpayers' understanding but also reduced their fear and confusion regarding filing procedures, ultimately leading to better compliance behavior. In the Ghanaian context, Atawodi and Ojeka (2012) emphasized that knowledge significantly influences compliance among small and medium enterprises (SMEs), especially when compliance systems are perceived as fair and understandable. Additionally, the findings resonate with Kirchler's (2007) slippery slope framework, which highlights that tax compliance can be strengthened not just through enforcement, but through fostering voluntary cooperation rooted in trust and understanding. Knowledge builds transparency and trust between tax authorities and citizens, thereby encouraging a more cooperative tax culture. However, not all studies report a straightforward relationship between knowledge and compliance. McKerchar and Evans (2009) argue that knowledge alone is not always sufficient to induce compliance, especially when broader structural or behavioral factors come into play. For example, economic hardship, perceptions of unfairness, and distrust in government institutions may override even a well-informed taxpayer's intention to comply. The discrepancies in existing research can be attributed to several factors: Socioeconomic and institutional contexts play a pivotal role. In regions with high corruption or limited public service delivery, such as in some African and Latin American countries, knowledge may not lead to compliance due to eroded trust in government (Fjeldstad & Semboja, 2001). Conversely, in more transparent environments, taxpayers who understand the system are more likely to comply voluntarily. Secondly, the structure of the tax base and prevalence of informality affect the relevance of tax knowledge. In informal economies, many economic activities are unregistered, reducing the influence of tax education campaigns that target formal actors (Joshi, Prichard, & Heady, 2014). Moreover, differences in how tax knowledge is measured can explain varied findings. While some studies assess general awareness, others evaluate in-depth technical understanding. According to McKerchar (2003), superficial knowledge may have little behavioral impact, whereas comprehensive understanding, including legal responsibilities and benefits of tax payment, can significantly influence compliance. Cultural and behavioral differences also contribute to inconsistent results. Torgler (2007) argues that social norms, civic morality, and peer behavior often moderate how knowledge is applied. In cultures where tax evasion is normalized, even informed taxpayers may choose non-compliance. Enforcement levels further complicate the relationship. In jurisdictions with strong monitoring and penalties, tax knowledge may amplify the deterrent effect; in low-enforcement settings, however, knowledge might not be sufficient to change behavior (Alm, Jackson, & McKee, 1992). Lastly, differences in target populations, such as employees, entrepreneurs, or informal traders, can affect how knowledge influences behavior. For example, salaried workers with automatic tax deductions may not require the same level of tax knowledge as self-employed individuals who must actively file taxes and calculate liabilities.

Furthermore, the present study examined the moderating role of tax knowledge in the relationship between tax digitization and tax compliance among taxpayers. The findings revealed that tax knowledge significantly moderates this relationship, thereby refuting the null hypothesis that tax knowledge does not influence the effect of tax digitization on tax compliance. This result emphasizes that the effectiveness of digitized tax systems is not uniform across all taxpayers but depends, in part, on the level of tax knowledge they possess.

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This outcome supports previous studies suggesting that informed taxpayers are more likely to engage effectively with digital tax systems, leading to higher levels of compliance (Saad, 2014; Kirchler, 2007). Tax knowledge enhances taxpayers' ability to interpret, navigate, and utilize digital tools efficiently, minimizing errors and increasing voluntary compliance. Digital systems, while streamlining tax processes, still require users to understand basic tax obligations, deadlines, and procedures. Those with low tax knowledge may perceive these systems confusing or intimidating, which can result in accidental non-compliance or avoidance (OECD, 2019). The current finding aligns with the work of Alm, Bloomquist, and McKee (2017), who demonstrated that information availability and peer effects significantly enhance compliance, particularly when supported by tax literacy. Similarly, Azmi and Bee (2010) observed that Malaysian taxpayers with higher tax knowledge made better use of e-filing systems, suggesting that digital tools are more effective when users understand the broader tax framework. However, some research has reported divergent outcomes. Muturi and Kiarie (2015), studying taxpayers in Kenya, found that digitized tax systems improved compliance even among individuals with limited tax knowledge. They argued that user-friendly interfaces and automated functions can reduce the need for deep understanding. Such findings suggest that the moderating role of tax knowledge may not be universal but context-dependent. Several contextual and methodological factors can account for the observed discrepancies across studies. The complexity of a country's tax system plays a pivotal role. In jurisdictions with intricate tax laws and multifaceted filing procedures, tax knowledge becomes essential to interpret and comply with digital systems. In contrast, in countries with simplified tax regimes, taxpayers may be able to use digital systems without deep understanding, diminishing the moderating effect of tax knowledge (Saad, 2014; Torgler, 2007). Digital literacy levels and access to reliable technological infrastructure also influence the relationship. In technologically advanced societies, even taxpayers with limited tax knowledge may find it easier to navigate digital tax systems. However, in developing nations, where digital literacy and internet penetration are lower, tax knowledge becomes more critical for leveraging digitized platforms effectively (Azmi & Bee, 2010; OECD, 2019). Variations may also stem from the extent of taxpayer education initiatives. Countries that invest in public tax education tend to minimize knowledge gaps, reducing disparities in how taxpayers benefit from digitization. In contexts lacking such initiatives, differences in individual tax knowledge can significantly influence outcomes (Alm et al., 2017). Differences in study design, such as the operational definitions of tax knowledge and compliance, data sources, and analysis methods, can yield contrasting results. Some studies may define tax knowledge narrowly (e.g., knowledge of tax rates), while others take a broader approach that includes procedural understanding or behavioral attitudes (Kirchler, 2007; Torgler, 2007). Cultural norms, trust in government, perceived fairness of the tax system, and enforcement attitudes can also shape taxpayer behavior. In high-trust environments, taxpayers may comply regardless of their knowledge levels, while in low-trust settings, knowledgeable individuals may either avoid taxes through legal loopholes or comply due to a stronger understanding of consequences (Kirchler, Hoelzl, & Wahl, 2008).

CONCLUSION

This study investigated the influence of tax digitalization on tax compliance in Ghana, with particular attention to the moderating role of tax knowledge. The results demonstrated that tax digitalization has a significant positive impact on tax compliance, emphasizing the value of digital tools in improving the efficiency and effectiveness of tax administration. Furthermore,

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tax knowledge was found to exert a direct positive influence on compliance behavior, indicating that taxpayers who are more informed about tax laws and procedures are more likely to fulfill their tax obligations. Despite the observed statistical relationships, respondents generally remained neutral in their self-assessments regarding tax knowledge, utilization of digital tax systems, and compliance practices. This neutrality suggests a potential gap between the availability of digital tools and taxpayers' readiness or willingness to engage with them fully, possibly due to limited awareness, inadequate training, or systemic challenges. Crucially, the findings revealed that tax knowledge significantly moderates the relationship between tax digitalization and tax compliance. The evidence indicates that the effectiveness of digital tax platforms is enhanced when taxpayers possess a sufficient understanding of tax-related information. In other words, digitalization alone may not yield optimal compliance outcomes without complementary efforts to improve taxpayer education. In light of these findings, it is recommended that the Ghana Revenue Authority (GRA) and relevant stakeholders invest in comprehensive taxpayer education initiatives, public awareness campaigns, and user-friendly digital tools that align with the technological capabilities and knowledge levels of taxpayers. A dual approach combining technological innovation with capacity-building will be vital in promoting a more compliant and digitally engaged taxpayer base. Future research could expand this study by exploring qualitative perspectives on barriers to digital tax system adoption or by conducting comparative studies across different regions or income groups to further contextualize the findings.

Despite the study's contributions, it is important to acknowledge several limitations. Firstly, the study utilized a cross-sectional research design, which limits the capacity to infer causal relationships between tax digitization, tax knowledge, and tax compliance. Longitudinal or experimental designs in future research could better capture causal relationships and dynamic changes over time. Second, the data were collected through self-reported questionnaires, which may be subject to response bias, such as social desirability or recall bias. While efforts were made to ensure anonymity and reduce bias, the accuracy of self-reported tax compliance behavior remains a concern. Third, the study took place in a specific area and administrative setting, which might make it hard to apply the results to other places with different tax rules, technology use, or types of taxpayers. Comparative studies across multiple regions or countries could provide broader insights. Lastly, while the moderating role of tax knowledge was established, other potentially influential variables, such as the perceived fairness of the tax system, trust in tax authorities, or digital literacy, were not considered. Including these factors in future models may offer a more comprehensive understanding of taxpayer behavior in the context of digital transformation.

POLICY IMPLICATION

The findings have important implications for both tax administrators and policymakers. While digitization improves efficiency and accessibility in tax administration, taxpayer education significantly amplifies its effectiveness. Efforts to modernize tax systems must be paired with investments in improving tax literacy, especially among small business owners, low-income earners, and rural populations who may lack formal financial education. Again, the Ghana Revenue Authority (GRA) and local governments should intensify taxpayer education efforts using localized, practical, and accessible communication channels, including radio programs, workshops, and community engagement forums. Secondly, integrating tax education into

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school curricula and vocational training programs could foster long-term tax consciousness, especially among young entrepreneurs and informal sector workers.

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