

An Exploration of the Barriers of E-Tax System Adoption as a Strategy for Enhancing Taxpayer Compliance among Small and Medium Taxpayers at the Zambia Revenue Authority

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Abstract

The adoption of digital tax systems is increasingly becoming a global trend, aimed at improving tax compliance, efficiency, and revenue collection. However, in Zambia, the transition to e-tax filing among small and medium taxpayers has been slow, with several factors hindering its effective adoption. This study investigated the key barriers to e-tax adoption and examined the role of attitude, subjective norms, perceived behavioural control, and intention in influencing taxpayers' actual use of the system. Using the Theory of Planned Behaviour as a guiding framework, the study seeks to understand the extent to which these psychological and structural factors impact e-tax adoption and identify potential interventions to enhance digital tax compliance. The study employed a quantitative research design, using a structured survey to collect data from 399 small and medium taxpayers in Zambia. The data was analysed using descriptive statistics, correlation analysis, and multiple regression modelling using SPSS to determine the relationship between taxpayers' behavioural factors and their actual e-tax adoption. The findings revealed that attitude is the strongest predictor of e-tax adoption, with a moderate positive correlation ($r = 0.475$) with intention. Subjective norms had a weaker effect ($r = 0.241$), suggesting that social pressure alone does not significantly influence adoption. Perceived behavioural control did not significantly predict actual use ($\beta = 0.072$, $p = 0.239$), indicating that confidence in using e-tax does not necessarily translate into usage. The regression analysis showed that only 13.9% ($R^2 = 0.139$) of the variation in actual e-tax adoption was explained by the model, implying that external barriers such as internet accessibility, technical failures, and enforcement policies play a much larger role in influencing compliance.

The findings suggested that improving system reliability, expanding taxpayer training, enhancing internet accessibility, and introducing financial incentives would significantly increase e-tax adoption. Future research should explore trust in digital taxation, the role of mobile tax solutions, and the impact of government enforcement mechanisms on tax compliance.

Keywords

E-Tax System, Adoption, Taxpayer Compliance, Tax Administration, Small and Medium Taxpayers

1. Introduction

The adoption of electronic tax (e-tax) systems has emerged as a pivotal strategy for enhancing taxpayer compliance across various tax administrations globally. The Zambia Revenue Authority (ZRA), recognising the potential of digital solutions, has implemented an e-tax system to streamline tax processes, improve efficiency, and ultimately increase compliance among taxpayers. The shift from traditional, manual tax processes to an e-tax system is motivated by the need to address challenges such as tax evasion, delayed tax filings, and low compliance rates that have historically plagued tax authorities in developing countries, including Zambia (Bwalya et al., 2021).

The implementation of the e-tax system is expected to reduce the administrative burden on taxpayers by offering a more user-friendly platform that facilitates timely and accurate tax filing (Chisanga & Mwansa, 2022). Moreover, the system is designed to enhance transparency and accountability, thereby fostering trust between the ZRA and taxpayers. This trust is crucial for improving voluntary compliance, which is a key objective for any tax authority aiming to maximise revenue collection (Mwansa, 2020).

Despite the anticipated benefits, the success of the e-tax system largely depends on its adoption by taxpayers. Factors such as ease of use, accessibility, and taxpayers' perceptions of the system's effectiveness play a significant role in determining the level of adoption (Kalaba & Ndhlovu, 2019). Therefore, this study seeks to explore the extent to which the adoption of the e-tax system by ZRA can enhance taxpayer compliance, while also identifying the challenges and opportunities associated with its implementation.

The proposed research aimed to critically evaluate the effectiveness of the e-tax system as a strategic tool for enhancing taxpayer compliance at the Zambia Revenue Authority. Guided by the Theory of Planned Behaviour (TPB), the research explored key factors affecting taxpayer behaviour and provided recommendations to optimize the system's use. The study is structured into six comprehensive sections: introduction, literature review, research methodology, research findings, discussion of research findings, and conclusion and recommendations.

2. Literature Review

The adoption of e-tax systems has become a global priority for revenue authorities aiming to enhance compliance, efficiency, and revenue collection. However, despite the benefits associated with e-tax systems, small and medium taxpayers (SMEs) often face significant challenges in adopting these digital platforms. Several studies have explored the factors that hinder the adoption of e-tax systems, revealing barriers related to technological, financial, psychological, and institutional aspects (Alabede, 2019; OECD, 2021). This literature review examines key factors that impede the adoption of e-tax systems among SMEs, including technological constraints, lack of awareness and digital literacy, perceived complexity, cost implications, and trust issues.

Technological infrastructure plays a crucial role in the successful implementation of e-tax systems. In many developing countries, inadequate access to reliable internet connectivity and electricity significantly hampers the ability of small businesses to use digital tax platforms (Muita, 2018). SMEs operating in rural and remote areas often face greater challenges due to limited broadband penetration and frequent network disruptions (Bwalya & Mutula, 2019). Additionally, outdated computer systems and lack of access to modern software further discourage small businesses from embracing e-tax systems (Ochieng, 2020).

A major impediment to e-tax adoption is the lack of digital literacy among small and medium taxpayers. According to a study by Karanja (2022), many SME owners lack the necessary knowledge and skills to navigate online tax platforms effectively. This problem is exacerbated by inadequate training and awareness campaigns from tax authorities, leaving many taxpayers unaware of how to register, file, and submit taxes electronically (Bakar, 2020). Moreover, resistance to technology adoption is often observed among older business owners who prefer traditional paper-based tax filing due to their familiarity with manual processes (Boadi et al., 2019).

Additionally, the complexity of e-tax platforms is another major barrier to adoption. SMEs often perceive these systems as complicated and difficult to use, leading to reluctance in transitioning from manual to digital filing (Jenkins & Forlemu, 2021). A study by Chalu and Mugoya (2022) found that taxpayers often struggle with technical jargon, multi-step registration procedures, and frequent system downtimes, which discourage them from engaging with e-tax platforms. The usability of the e-tax system, including interface design and ease of navigation, significantly influences adoption rates, with poorly designed systems reducing user motivation (Yusuf et al., 2018).

The financial burden associated with adopting e-tax systems is another challenge for SMEs. Studies indicate that the costs of acquiring necessary digital devices, internet access, and professional tax consultancy services pose a financial strain on small businesses (Amponsah & Adams, 2020). Additionally, compliance costs such as software upgrades, transaction fees, and cybersecurity investments deter small taxpayers from adopting the system (Mwangi & Njenga, 2021b). In

economies where SMEs operate with thin profit margins, these additional costs can be discouraging and result in continued preference for manual tax filing methods.

Trust in the e-tax system and concerns about cybersecurity risks significantly influence adoption decisions. SMEs often fear data breaches, system failures, and fraudulent activities, which undermine confidence in digital tax platforms (Mutinda, 2019). A report by the International Monetary Fund (IMF, 2018) highlights that many small taxpayers worry about exposing sensitive financial information online due to the increasing number of cyberattacks targeting financial institutions and government platforms. Without adequate security assurances, SMEs remain hesitant to fully transition to e-tax systems (Agbemabiese & Acheampong, 2020).

2.1. Research Model

The research model for this study is anchored in the Theory of Planned Behaviour (TPB), which serves as a comprehensive model for understanding the factors influencing the adoption of the e-tax system and its subsequent impact on taxpayer compliance. The TPB, developed by Ajzen (1991), posits that an individual's behaviour is determined by their intention to perform the behaviour, which is in turn influenced by their attitudes, subjective norms, and perceived behavioural control.

According to the research model above (Figure 1), the adoption of the e-tax system by small and medium taxpayers at ZRA is influenced by their attitudes, subjective norms, and perceived behavioural control. Positive attitudes toward the system, strong social influences, and a high degree of perceived control are expected to enhance the likelihood of adopting the e-tax system, which, in turn, should improve taxpayer compliance.

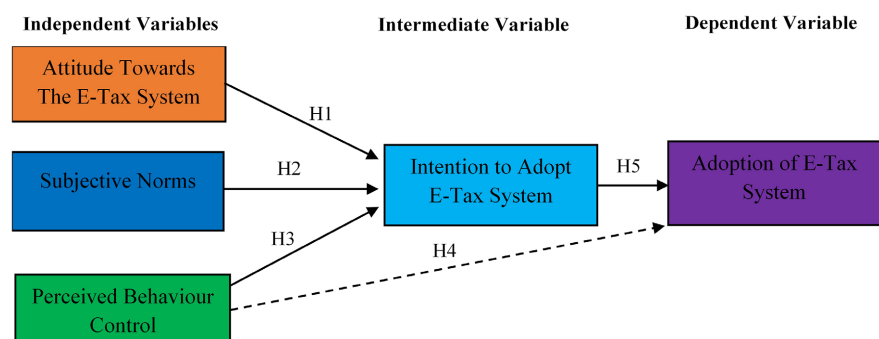


Figure 1. The proposed research model based on the TPB model by Ajzen (1991).

2.2. Research Hypotheses

The following hypotheses were used:

- H1: Attitude has a positive and significant effect on adoption of e-tax system through intention.
- H2: Subjective Norms have a positive and significant effect on adoption of e-

tax system through intention.

- H3: Perceived behavioural control has a positive and significant effect on adoption of e-tax system through intention.
- H4: Perceived behavioural control has a positive significant effect directly on adoption of e-tax system.
- H5: Intention has a positive and significant effect on adoption of e-tax system.

3. Methodology

The quantitative research design was used for the study. The design is a non-experimental approach aimed at describing the characteristics of a population or phenomenon while exploring the relationships between variables. As such this research design was used to adequately describe characteristics and behaviours related to e-tax adoption at ZRA by small and medium taxpayers. This design focused on understanding how factors naturally occur and how they are interconnected, without manipulating any variables. It involved gathering data to describe the situation being studied and, simultaneously, determining if there are any significant associations between different elements. This makes it ideal for situations where the researcher is seeking to identify and understand variables as they naturally exist and how they are interrelated, but without assuming causality (Creswell, 2014).

The research design was well-suited for the study because it focused on examining relationships between key variables (such as barriers and compliance behaviour) without manipulating these factors. The aim was to describe the current state of affairs, which aligns perfectly with a quantitative approach (Creswell, 2014). Moreover, correlational analysis allowed to uncover associations that provided useful insights, such as whether barriers like technological issues were linked to decreased adoption rates.

The study population was composed of 205,130 SMEs registered with ZRA and based in Lusaka Province of Zambia were specifically sampled for this study as they accounted for 45.2% of the total currently registered taxpayers.

To calculate the sample size, Yamahane formula was used. Yamahane's formula helped in calculating an appropriate sample size from a population, particularly when the exact size of the population is known. It was crucial for ensuring that a sample is representative and statistically significant (Yamahane, 1967). The formula is as shown:

$$n = \frac{N}{1 + N(e)^2} \quad (1)$$

where; n = the required sample size, N = the number of SMEs in the population and e = the allowable error (%). Substituting numbers in the formula gives us:

$$n = 205,130 / 1 + (205,130 (0.05)^2).$$

$$n = 205,130 / 513.825.$$

$$n = 399.22.$$

Therefore, the sample size for the research was 399.

This study employed probability sampling with a simple random technique to select SME taxpayers, a methodological choice that offers several important advantages for research on e-tax adoption barriers. First and foremost, this approach ensures strong representativeness and generalizability of findings by giving every SME taxpayer in ZRA's registry an equal chance of selection. This random selection process is particularly crucial for tax compliance research, as it eliminates potential selection bias that could occur if researchers consciously or unconsciously favoured certain types of businesses. The resulting sample naturally reflects Zambia's diverse SME landscape across sectors, business sizes, and geographic locations, allowing findings to be confidently extended to the broader population of small and medium taxpayers.

The use of probability sampling also provides essential statistical rigor for this quantitative study. By following random selection principles, the research satisfies key assumptions required for applying inferential statistics and calculating meaningful confidence intervals around the findings. This statistical robustness is especially valuable when analyzing relationships between different e-tax adoption barriers and compliance behaviors, as it allows researchers to determine whether observed patterns likely exist in the full population rather than just appearing in a skewed sample. The method's objectivity also enhances the study's credibility with both academic peers and ZRA policymakers who need unbiased evidence to guide digital transformation decisions.

Practical considerations further supported the choice of simple random sampling. ZRA's comprehensive taxpayer registers provided a complete and reliable sampling frame, while digital tools facilitated efficient random selection from this database. The approach proved operationally feasible without requiring complex stratification, which aligned well with the study's exploratory nature and available resources. Importantly, this sampling strategy positions the research for valuable future comparisons—both with subsequent Zambian studies tracking e-tax adoption over time and with international research using similar probability methods.

While acknowledging that pure random sampling could potentially underrepresent rare subgroups, the study mitigated this limitation through an adequate sample size and supplementary qualitative components. Ultimately, the probability approach provides the most scientifically sound foundation for investigating systemic e-tax adoption barriers and testing theoretical models across Zambia's diverse SME taxpayer population. The methodological rigor supports the development of evidence-based recommendations that ZRA can confidently apply to its nationwide digital tax system improvements.

This study employed systematic random sampling to select SME participants from ZRA's taxpayer registry, a method chosen for its balanced combination of statistical rigor and practical implementation. The approach was particularly suitable given the availability of a complete, ordered sampling frame and the need for efficient data collection from Zambia's large SME population while maintaining research quality under typical resource constraints of developing country studies

(Ali et al., 2021). Using the standard interval formula ($K = N/n$, where K represents sampling interval, N is population size, and n is sample size), the method ensured equal selection probability while preventing periodicity bias (Kish, 1965; Cochran, 1977). Systematic random sampling was used to sample out the SMEs using the following formula:

$$K = N/n \quad (2)$$

where: N = total population size = 205,130; n = desired sample size = 399.

$$K = 205,130/399.$$

$$K = 514.$$

Therefore, every 514th SME was selected from the population of SMEs.

Systematic random sampling was a method used to select a sample from a population in a systematic way, typically by choosing every k th element from a list after a random start.

The systematic approach maintained essential probability sampling characteristics required for valid statistical generalization, including the ability to calculate sampling errors and apply inferential techniques (Lohr, 2019). Its appropriateness was further confirmed by the taxpayer registry's lack of inherent ordering that could introduce bias and the research's need for geographically dispersed respondents. Potential limitations were mitigated through randomization of the starting point and verification of consistency across sampled units. This methodology aligns with established practices in tax compliance research (Bird & Zolt, 2008) while addressing the practical challenges of fieldwork in Zambia's SME sector, making it both scientifically sound and operationally feasible for studying e-tax adoption barriers.

4. Results

4.1. Demographic Data

The demographic distribution of respondents (Figures 2-6) provides context for understanding variations in e-tax adoption. The study revealed that 59% of respondents were male and 41% were female (Figure 2), indicating a near-balanced gender representation. Similar trends were observed in marital status, with 38% of respondents being married (Figure 3). The age distribution (Figure 4) indicated that the majority of respondents (25%) fell within the 31 - 40 age group, which aligns with prior studies suggesting that middle-aged individuals are more engaged in formal economic activities and thus more likely to interact with taxation systems (Kassim & Karanja, 2020).

Regarding educational attainment, the highest number of respondents held a master's degree (27%), while the lowest had PhDs (14%) (Figure 5). This educational distribution suggests that most respondents were well-educated, which may influence their ability to navigate the e-tax system. However, despite relatively high education levels, significant challenges in e-tax adoption were observed, suggesting that factors beyond education, such as system usability and accessibility, play a crucial role (Mwangi & Njenga, 2021a).

GENDER DISTRIBUTION OF RESPONDENTS

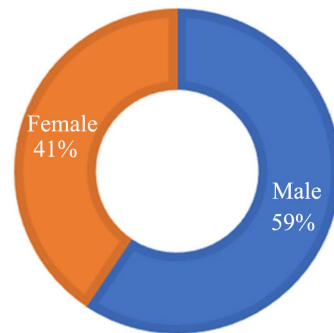


Figure 2. Gender distribution.

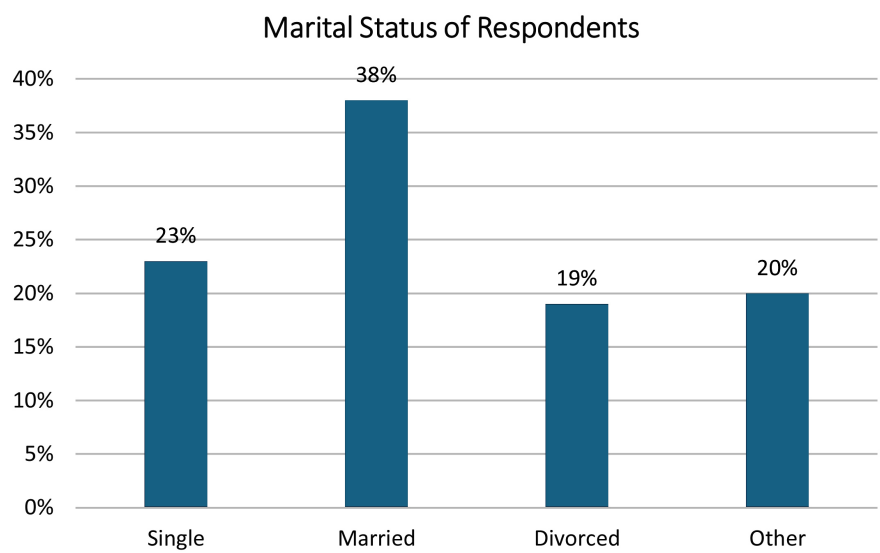


Figure 3. Marital status of respondents.

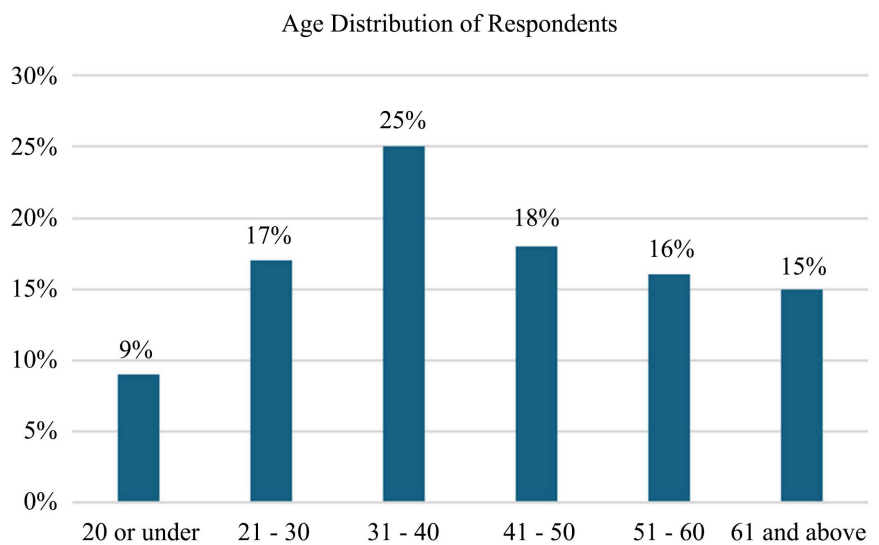


Figure 4. Age distribution.

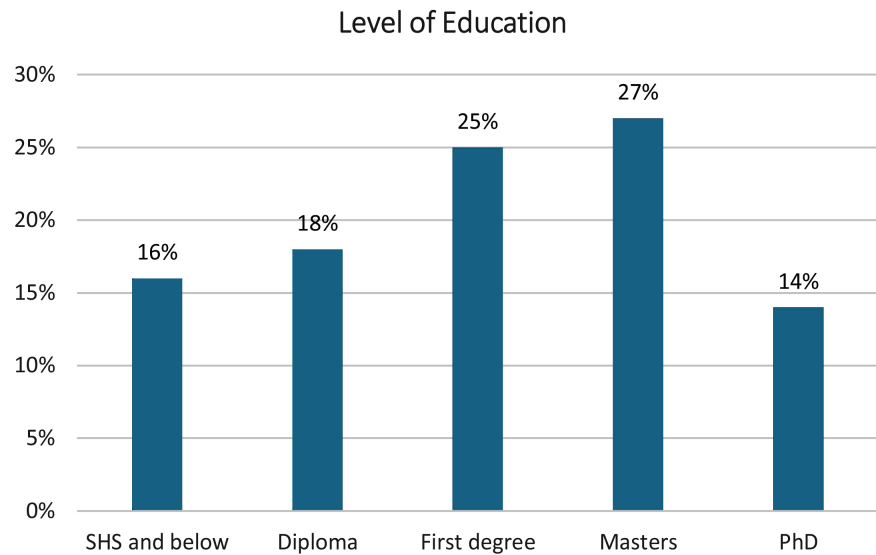


Figure 5. Levels of education.

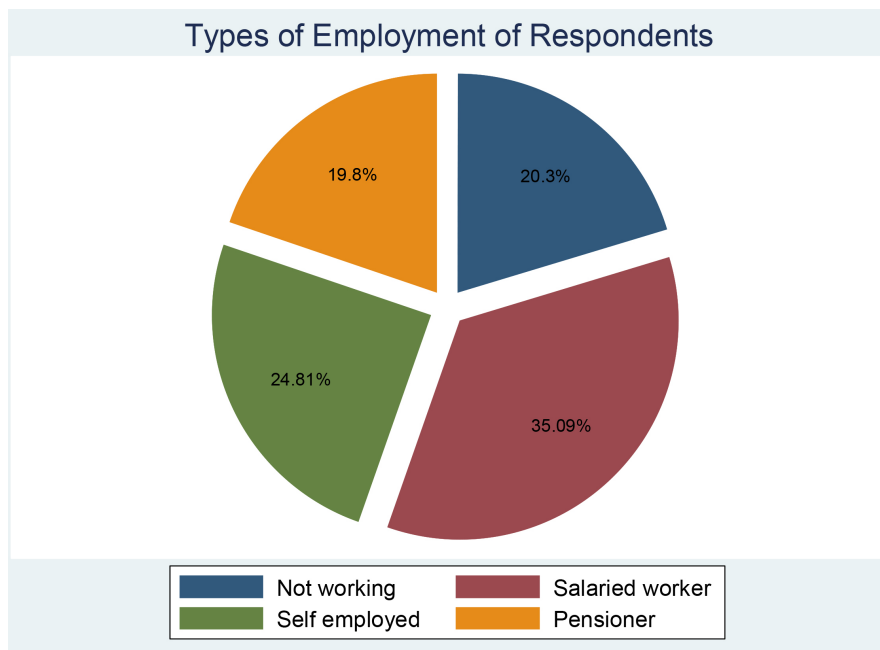


Figure 6. Types of employment of respondents.

The employment distribution (Figure 6) showed that 35% of respondents were salaried workers, 25% were self-employed, 20% were not working, and 20% were pensioners. This diversity indicates that e-tax adoption must cater to different employment categories, each with unique tax obligations and digital literacy levels.

4.2. Factors That Hinder the Adoption of E-Tax System among Small and Medium Taxpayers at ZRA

In terms of identifying the factors that hinder the adoption of e-tax system the research looked at various factors as computer knowledge of respondents, access

to reliable internet, training on e-tax usage and technical challenges experienced during the use of the e-tax system. **Figure 7** shows that 14% of respondents had poor or very poor knowledge of computers, while only 29% had a very good command of computers. Similarly, **Figure 8** revealed that 29% of respondents had poor or very poor knowledge of the Internet. These findings are consistent with research by **Chalu and Mugoya (2022)**, which found that low digital literacy significantly hinders the adoption of digital tax platforms in developing economies.

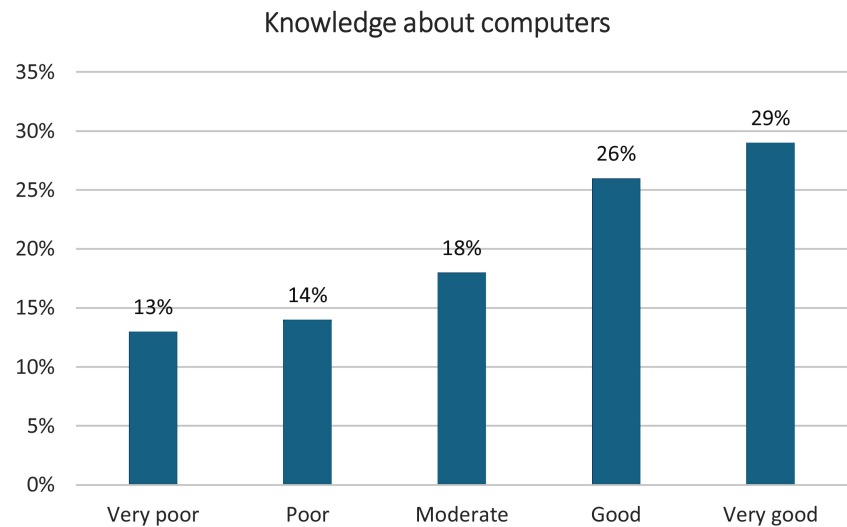


Figure 7. Knowledge of computers.

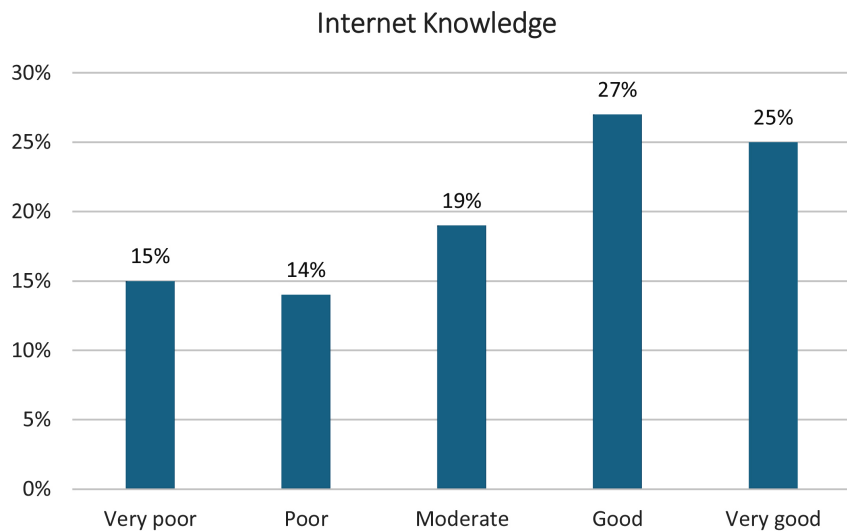


Figure 8. Knowledge of Internet.

Additionally, **Figure 9** highlights that only 25% of respondents had reliable internet access, whereas 41% indicated that they “sometimes” have access, and 33% lacked access altogether. This suggests that internet reliability remains a major barrier to e-tax adoption, confirming findings by **Yusuf et al. (2018)** that infrastructure deficiencies limit digital tax compliance in sub-Saharan Africa.

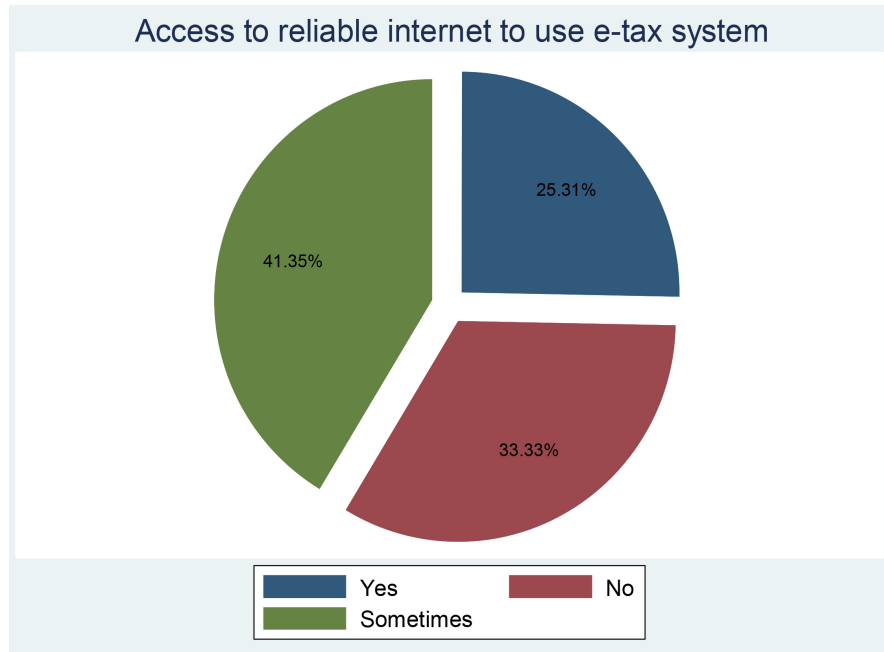


Figure 9. Access to reliable Internet.

With reference to the ease of use, Figure 10 showed that 26% of respondents found the e-tax system difficult to navigate, and 13% found it very difficult. Comparatively, only 20% found it easy. Coupled to this, is the incidence of technical failures. Figure 11 revealed that only 12% of respondents never experienced technical failures, while 42% reported experiencing them “often” or “always”. These findings align with studies by Muita (2018), which emphasized that complex system interfaces and frequent downtimes deter taxpayers from using digital tax platforms effectively.

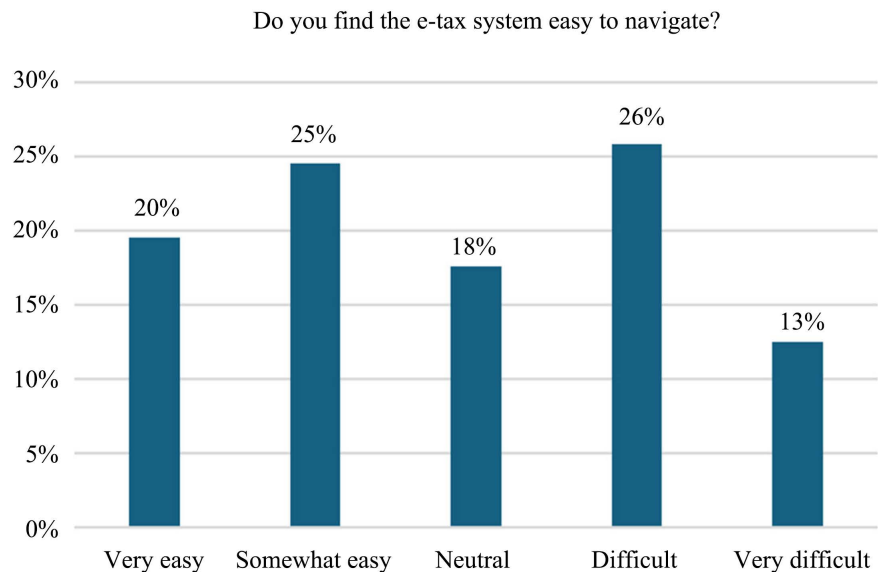


Figure 10. Easy to navigate e-tax system.

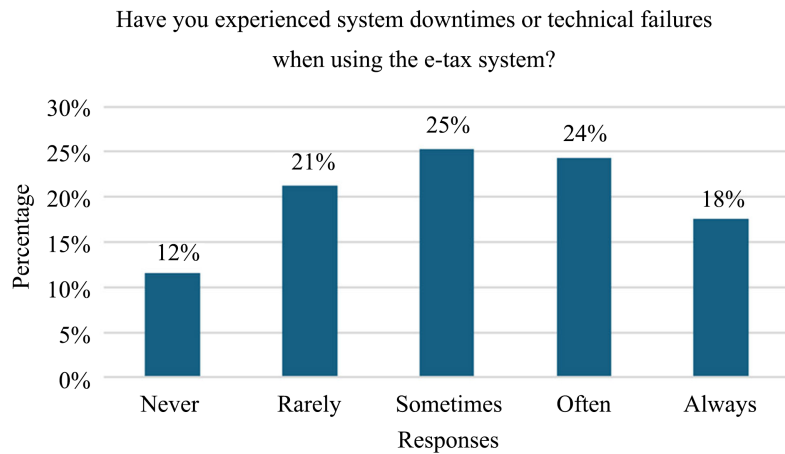


Figure 11. system downtime or technical failure.

Contributing to the factors hindering adoption of e-tax was the training in the usage of e-tax system. **Figure 12** indicates that 48% of respondents received training on e-tax from ZRA, while 30% had no training, and 22% were trained by tax consultants. This suggests that while training efforts exist, coverage remains inadequate. Prior research (Mwangi & Njenga, 2021a) confirms that targeted training significantly improves digital tax compliance.

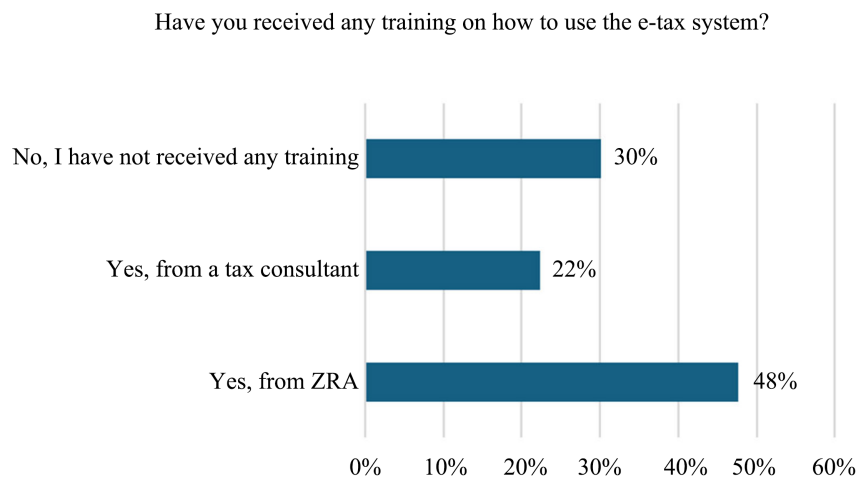


Figure 12. Training in the use of e-tax system.

4.3. Effective Use of E-Tax System among Small and Medium Taxpayers at ZRA

Respondents indicated that they use the e-tax system to view account statements. **Figure 13** shows that 22% of respondents always use e-tax for this purpose, while 12% never use it. They also used the system to file returns. **Figure 14** reveals that 30% always file returns via e-tax, but 15% never use it for this function. Additionally, it was indicated that the system was used to paying taxes and fees as shown in **Figure 15** which indicates that 30% always use e-tax for payments, while 16% never use it.

Frequency of the use of e-tax system to view account statement

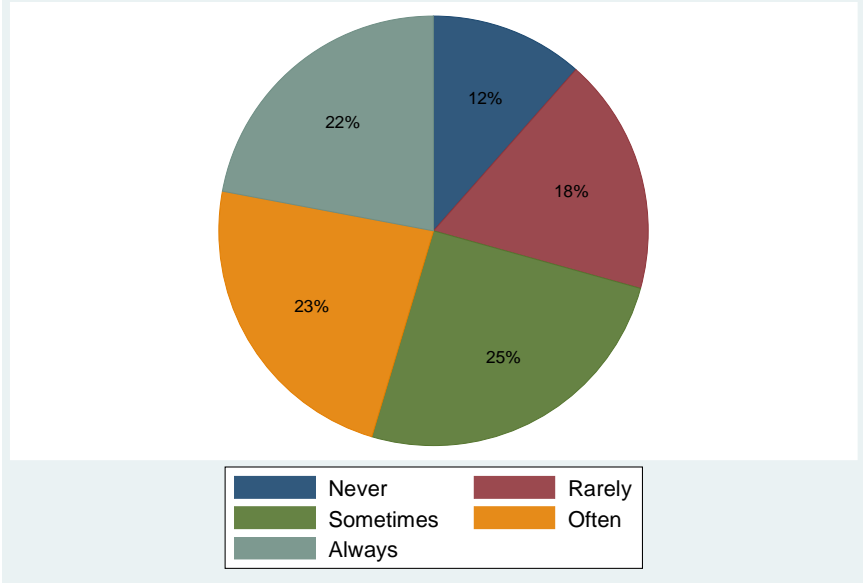


Figure 13. Use to view account statements.

Frequency of the use of e-tax system to file returns

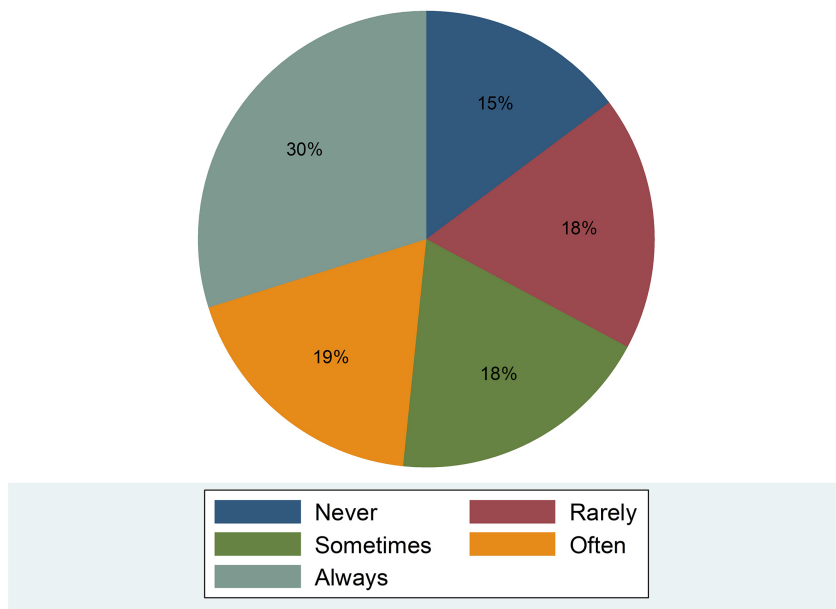


Figure 14. Use to file returns.

When respondents were asked on how frequently they use e-tax system in a week, **Figure 16** shows that 28% used e-tax more than three times a week, but 25% did not use it at all weekly. These findings indicate that while a portion of taxpayers actively use e-tax, many remain inconsistent users. Studies by **Amponsah and Adams (2020)** suggest that adoption gaps often stem from usability issues and lack of incentives.

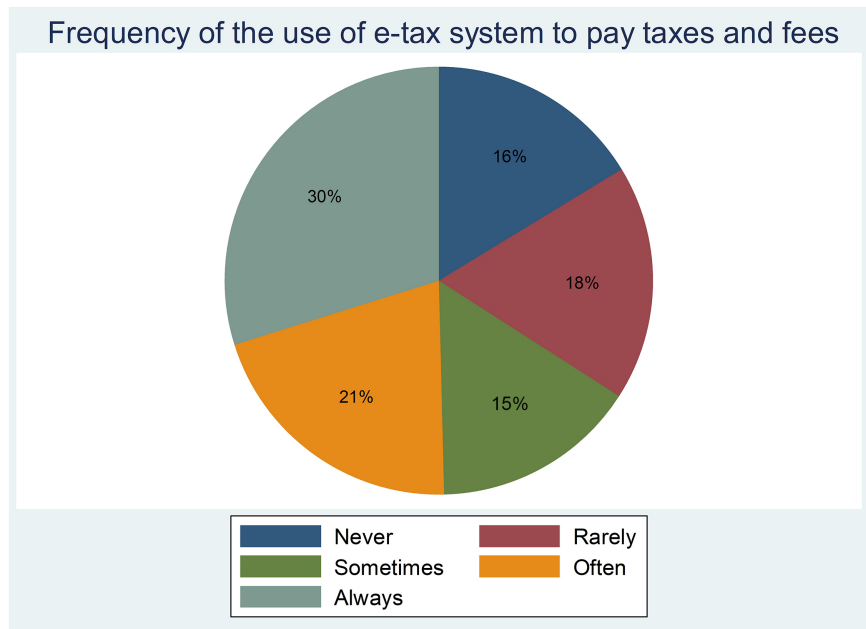


Figure 15. Use to pay taxes and fees.

On a weekly basis, how many times do you use e-tax system?

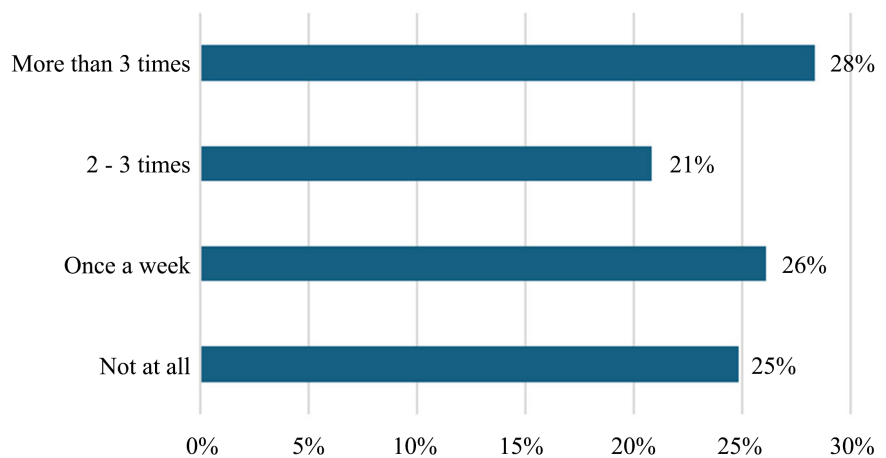


Figure 16. Use on a weekly basis.

4.4. Evaluate TPB’s Applicability by Testing Its Three Constructs (Attitude, Subjective Norms, Perceived Control) against E-Tax Adoption among Small Taxpayers at ZRA

4.4.1. Correlation Analysis

A Pearson Correlation analysis was conducted using SPSS in order to check if there is a linear relationship between the dependent and independent variables.

According to **Table 1**, the research findings revealed that the relationship between attitude and subjective norms showed a weak to moderate positive correlation (0.357) implying that taxpayers with a positive attitude toward e-tax are

slightly influenced by external social pressures. However, subjective norms alone may not strongly shape attitudes. On the other hand, the relationship between attitude and perceived behaviour showed a weak to moderate positive correlation (0.327) implying Taxpayers who have a positive attitude toward e-tax tend to feel more in control of using the system. However, other external factors might also affect perceived control. The relationship between attitude and intention showed a moderate positive correlation (0.475) that entailed that attitude significantly influences the intention to use e-tax. Taxpayers with a positive perception of e-tax are much more likely to intend to adopt it. While a positive attitude helps encourage actual use, the relatively low correlation suggested that attitude alone does not fully determine behaviour. Other barriers limit adoption.

Table 1. Correlation analysis between attitude, subjective norms, perceived behavioural control, and intention to adopt e-tax system.

| | | Attitude | Subjective Norms | Perceived Behaviour Control | Intention |
|-----------------------------|---------------------|----------|------------------|-----------------------------|-----------|
| Attitude | Pearson Correlation | 1 | 0.357** | 0.327** | 0.475** |
| | Sig. (2-tailed) | | 0.000 | 0.000 | 0.000 |
| | N | 399 | 399 | 399 | 399 |
| Subjective Norms | Pearson Correlation | 0.357** | 1 | 0.229** | 0.241** |
| | Sig. (2-tailed) | 0.000 | | 0.000 | 0.000 |
| | N | 399 | 399 | 399 | 399 |
| Perceived Behaviour Control | Pearson Correlation | 0.327** | 0.229** | 1 | 0.328** |
| | Sig. (2-tailed) | 0.000 | 0.000 | | 0.000 |
| | N | 399 | 399 | 399 | 399 |
| Intention | Pearson Correlation | 0.475** | 0.241** | 0.328** | 1 |
| | Sig. (2-tailed) | 0.000 | 0.000 | 0.000 | |
| | N | 399 | 399 | 399 | 399 |

** . Correlation is significant at the 0.01 level (2-tailed).

Furthermore, the results in **Table 1** revealed that the relationship between subjective norms and perceived behaviour control showed a weak positive correlation (0.229). The external pressure slightly influences taxpayers’ confidence in using e-tax. However, personal skills and system usability may play a larger role. Meanwhile, the relationship between subjective norms and intention is a weak to moderate positive correlation (0.241). While social influences can shape intention, taxpayers appear to be more motivated by personal attitudes than external pressure.

The relationship between perceived behaviour control and intention to use showed a weak to moderate positive correlation (0.328). This implies that taxpayers who believe they have control over using e-tax have a positive intention to use

toward e-tax tend to feel more in control of using the system.

The relationship between perceived behaviour control and actual use (adoption) showed a very weak correlation (0.194) according to **Table 2**. Even if taxpayers believe they have control over using e-tax, it does not strongly translate into actual usage. Other practical barriers may hinder them.

Table 2. Relationship between perceived behaviour control and adoption.

| | | Perceived Behaviour Control | Adoption |
|-----------------------------|---------------------|-----------------------------|----------|
| Perceived Behaviour Control | Pearson Correlation | 1 | 0.194** |
| | Sig. (2-tailed) | | 0.000 |
| | N | 399 | 399 |
| Adoption | Pearson Correlation | 0.194** | 1 |
| | Sig. (2-tailed) | 0.000 | |
| | N | 399 | 399 |

** . Correlation is significant at the 0.01 level (2-tailed).

The relationship between intention and actual use (adoption) showed a weak to moderate positive correlation (0.287) according to **Table 3**. Taxpayers who feel they have the skills and resources to use e-tax are slightly more likely to intend to use it. However, other factors may also be at play.

Table 3. Relationship between intention and adoption.

| | | Intention | Adoption |
|-----------|---------------------|-----------|----------|
| Intention | Pearson Correlation | 1 | 0.287** |
| | Sig. (2-tailed) | | 0.000 |
| | N | 399 | 399 |
| Adoption | Pearson Correlation | 0.287** | 1 |
| | Sig. (2-tailed) | 0.000 | |
| | N | 399 | 399 |

** . Correlation is significant at the 0.01 level (2-tailed).

4.4.2. Regression Model

Regression analysis is a form of inferential statistics and to achieve the objective of the study, a multiple regression model was used to help assess the results and draw up conclusions on the assumptions or hypothesis of the study. The regression model was used to enable the researcher to assess the effect between a dependent (predicted) variable and several independent (predictor) variables. The result of multiple regression is the development of a regression equation line of best fit between the dependent variable and several independent variables (**Table 4**).

Table 4. Variables entered or removed.

| Model | Variables Entered | Variables Removed | Method |
|-------|---|-------------------|--------|
| 1 | Intention, Subjective Norms, Perceived Behaviour Control, Attitude ^b | | Enter |

a. Dependent Variable: Adoption, b. All requested variables entered.

Table 5 shows the regression model summary for the predictors attitude, subjective norms, perceived behaviour control and intention to use help determine the effect that the predictors have on the outcome variable by assessing the variations in R² that can be traced back to the predictors.

Table 5. Model summary of e-tax system adoption.

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|-------|--------------------|----------|-------------------|----------------------------|-------------------|----------|-----|-----|---------------|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | 0.373 ^a | 0.139 | 0.130 | 0.81619 | 0.139 | 15.878 | 4 | 394 | 0.000 |

a. Dependent Variable: Adoption, b. All requested variables entered.

Based on the results of the ANOVA Table (**Table 6**), the model shows that it is highly significant hence we can proceed to assess the effect because the p-value of F ratio 15.878 is <0.05 (*p*-value = 0.001). This shows that the adoption of the e-tax system by small and medium enterprises at ZRA is significantly affected, and the proportionate variations can be predicted from the independent variable.

Table 6. ANOVA table.

| Model | Sum of Squares | df | Mean Square | F | Sig. | |
|-------|----------------|---------|-------------|--------|--------|--------------------|
| 1 | Regression | 42.308 | 4 | 10.577 | 15.878 | 0.000 ^b |
| | Residual | 262.468 | 394 | 0.666 | | |
| | Total | 304.776 | 398 | | | |

a. Dependent Variable: Adoption, b. Predictors: (Constant), Intention, Subjective Norms, Perceived Behaviour Control, Attitude.

Table 7 shows that attitude, subjective norms, and intention are significant because *p*-value = 0.001 < 0.05 confidence interval set. The regression equation for predicting SME adoption of e-tax system is:

$$Y = 1.546 + 0.125 \times \text{Attitude} + 0.161 \times \text{Subjective Norms} + 0.151 \times \text{Intention}$$

The model illustrates that when all variables are held at zero (constant), the other factors contributing e-tax system adoption would be 1.546. However, holding other factors constant, a one-unit increase in attitude leads to a 0.125 increase in actual e-tax use, a one-unit increase in subjective norms leads to a 0.161 increase in actual e-tax use, and a one-unit increase in intention leads to a 0.151 increase in actual e-tax use. Therefore, the analysis above shows that the null hypothesis is rejected in favour of the alternative as there is not much or sufficient evidence to support it.

Table 7. Coefficients.

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | |
|-----------------------------|-----------------------------|------------|---------------------------|-------|-------|---------------------------------|-------------|
| | B | Std. Error | Beta | | | Lower Bound | Upper Bound |
| (Constant) | 1.546 | 0.230 | | 6.712 | 0.000 | 1.093 | 1.999 |
| Attitude | 0.125 | 0.054 | 0.130 | 2.311 | 0.021 | 0.019 | 0.232 |
| Subjective Norms | 0.161 | 0.051 | 0.161 | 3.175 | 0.002 | 0.061 | 0.260 |
| Perceived Behaviour Control | 0.072 | 0.061 | 0.060 | 1.179 | 0.239 | -0.048 | 0.193 |
| Intention | 0.151 | 0.049 | 0.167 | 3.073 | 0.002 | 0.054 | 0.247 |

a. Dependent variable: Adoption.

The regression analysis results (**Table 8**) indicate that the three hypotheses are supported meaning that the Zambia Revenue Authority should incorporate Attitude, Subjective Norms, and Intention if they were to enhance taxpayer compliance through the adoption of the e-tax system.

Table 8. Hypothesis test results.

| Hypothesis | Beta | p-Value | Test Comment |
|-----------------------------|-------|---------|--------------|
| Perceived Behaviour Control | 0.072 | 0.239 | Rejected |
| Attitude | 0.125 | 0.021 | Accepted |
| Subjective Norms | 0.161 | 0.002 | Accepted |
| Intention | 0.151 | 0.002 | Accepted |

5. Discussion

This section discusses the findings to answer the research questions.

The first research question was developed to identify key factors that hinder the adoption of e-tax system among small and medium taxpayers at ZRA. To answer the question, the researcher analysed questionnaire responses in form of descriptive statistics using SPSS and Excel.

The demographic distribution of respondents (**Figures 2-6**) provides context for understanding variations in e-tax adoption. The study revealed that 59% of respondents were male and 41% were female, indicating a near-balanced gender representation. Similar trends were observed in marital status, with 38% of respondents being married (**Figure 3**). The age distribution (**Figure 4**) indicated that the majority of respondents (25%) fell within the 31 - 40 age group, which aligns with prior studies suggesting that middle-aged individuals are more engaged in formal economic activities and thus more likely to interact with taxation systems (**Kassim &**

Karanja, 2020).

Regarding educational attainment, the highest number of respondents held a master's degree (27%), while the lowest had PhDs (14%) (Figure 5). This educational distribution suggests that most respondents were well-educated, which may influence their ability to navigate the e-tax system. However, despite relatively high education levels, significant challenges in e-tax adoption were observed, suggesting that factors beyond education, such as system usability and accessibility, play a crucial role (Mwangi & Njenga, 2021a).

The employment distribution (Figure 6) showed that 35% of respondents were salaried workers, 25% were self-employed, 20% were not working, and 20% were pensioners. This diversity indicates that e-tax adoption must cater to different employment categories, each with unique tax obligations and digital literacy levels.

In terms of identifying the factors that hinder the adoption of e-tax system the research looked at various factors as computer knowledge of respondents, access to reliable internet, training on e-tax usage and technical challenges experienced during the use of the e-tax system. Figure 7 shows that 14% of respondents had poor or very poor knowledge of computers, while only 29% had a very good command of computers. Similarly, Figure 8 revealed that 29% of respondents had poor or very poor knowledge of the Internet. These findings are consistent with research by Chalu and Mugoya (2022), which found that low digital literacy significantly hinders the adoption of digital tax platforms in developing economies.

Additionally, Figure 9 highlights that only 25% of respondents had reliable internet access, whereas 41% indicated that they "sometimes" have access, and 33% lacked access altogether. This suggests that internet reliability remains a major barrier to e-tax adoption, confirming findings by Yusuf et al. (2018) that infrastructure deficiencies limit digital tax compliance in sub-Saharan Africa.

With reference to the ease of use, Figure 10 showed that 26% of respondents found the e-tax system difficult to navigate, and 13% found it very difficult. Comparatively, only 20% found it easy. Coupled to this, is the incidence of technical failures. Figure 11 revealed that only 12% of respondents never experienced technical failures, while 42% reported experiencing them "often" or "always". These findings align with studies by Muita (2018), which emphasized that complex system interfaces and frequent downtimes deter taxpayers from using digital tax platforms effectively.

Contributing to the factors hindering adoption of e-tax was the training in the usage of e-tax system. Figure 12 indicates that 48% of respondents received training on e-tax from ZRA, while 30% had no training, and 22% were trained by tax consultants. This suggests that while training efforts exist, coverage remains inadequate. Prior research (Mwangi & Njenga, 2021a) confirms that targeted training significantly improves digital tax compliance.

The second research question was developed to analyse effective use of e-tax system among small and medium taxpayers at ZRA. To answer the question, the researcher analysed questionnaire responses in form of descriptive statistics using SPSS and Excel.

Respondents indicated that they use the e-tax system to view account statements. **Figure 13** shows that 22% of respondents always use e-tax for this purpose, while 12% never use it. They also used the system to file returns. **Figure 14** reveals that 30% always file returns via e-tax, but 15% never use it for this function. Additionally, it was indicated that the system was used to paying taxes and fees as shown in **Figure 15** which indicates that 30% always use e-tax for payments, while 16% never use it.

When respondents were asked on how frequently they use e-tax system in a week, **Figure 16** shows that 28% used e-tax more than three times a week, but 25% did not use it at all weekly. These findings indicate that while a portion of taxpayers actively use e-tax, many remain inconsistent users. Studies by **Amponsah and Adams (2020)** suggest that adoption gaps often stem from usability issues and lack of incentives.

The third research question was developed to evaluate TPB's applicability by testing its three constructs (attitude, subjective norms, perceived control) against e-tax adoption among small taxpayers at ZRA. To answer the question, the researcher analysed questionnaire responses in form of descriptive statistics using SPSS.

The correlation and regression analysis provided insights into the relationships between these behavioural factors and actual e-tax usage. The correlation results (**Table 1**) revealed a moderate positive correlation (0.475) between attitude and intention, confirming that a positive perception of e-tax significantly influences the willingness to adopt it. However, subjective norms had a weaker correlation with intention (0.241), reinforcing the earlier finding that external influence plays a relatively minor role in shaping taxpayer decisions. The weakest relationship was between perceived behavioural control and actual use (0.194) (**Table 2**), indicating that feeling capable of using e-tax does not necessarily translate into adoption.

Regression results further confirmed these relationships, with the overall model explaining only 13.9% ($R^2 = 0.139$) (**Table 5**) of the variation in actual e-tax use. This suggests that other external factors, such as enforcement policies, financial incentives, or technological infrastructure, play a bigger role in determining adoption. **Table 7** indicated that attitude ($\beta = 0.125, p = 0.021$), subjective norms ($\beta = 0.161, p = 0.002$), and intention ($\beta = 0.151, p = 0.002$) were significant predictors of e-tax use, meaning that a positive perception and a strong willingness to adopt e-tax slightly increase actual usage. Perceived behavioural control ($\beta = 0.072, p = 0.239$), however, was non-significant, confirming that confidence alone does not drive adoption and that external structural factors likely play a larger role in determining whether taxpayers transition to digital tax systems.

These findings indicate that while attitudes, subjective norms, and intentions are important in shaping taxpayers' willingness to adopt e-tax, they are not sufficient drivers of actual usage. The weak influence of perceived behavioural control suggests that external interventions such as better enforcement mechanisms, sim-

plified user experiences, and improved internet access are necessary to bridge the gap between intention and actual behaviour. Addressing these systemic challenges could significantly enhance e-tax adoption rates and compliance levels.

6. Conclusion

The study concluded that while the e-tax system in Zambia has the potential to enhance taxpayer compliance, its adoption remains hindered by various factors including computer knowledge, internet knowledge, access to reliable internet, e-tax system navigation, training on e-tax usage, and technical challenges experienced during the use of the e-tax system.

When it comes to effective use of e-tax system among small and medium taxpayers at ZRA, the study concluded that most taxpayers use the e-tax system to view account statements, file returns, and pay taxes and fees; and that they use e-tax system at least once in a week. These findings indicated that while a portion of taxpayers actively use e-tax system, many remain inconsistent users.

Attitudes, perceived behavioural control, and subjective norms were identified as significant factors influencing taxpayer intentions and actual use of the e-tax system, with attitudes having the strongest impact.

7. Recommendations

Based on the study findings, the following recommendations were proposed to enhance the adoption and effective use of the e-tax system:

- Simplifying the e-tax system by improving its user interface, providing clear step-by-step navigation guides, and integrating multilingual support.
- Expanding internet coverage in underserved areas through partnerships with internet service providers and mobile network operators would help bridge limited internet access gap.
- Introducing offline tax filing options, where taxpayers can complete returns offline and submit them once they have internet access.
- Expanding training initiatives by making digital tax literacy a mandatory component of taxpayer registration would ensure that new users understand the system from the outset.
- Regular training workshops, webinars, and the development of video tutorials and online help centres would further improve taxpayers' ability to navigate the platform.
- Develop public awareness campaigns highlighting the system's benefits, such as time savings, ease of use, and compliance incentives.
- Partner with community leaders, business associations, and tax professionals to advocate for e-tax adoption.
- Financial incentives can also play a key role by introducing tax discounts or rebates for consistent e-tax users, offering penalty waivers for first-time filers, and providing loyalty rewards for early tax filers would encourage taxpayers to transition to the digital system.

8. Limitations of the Study

Since the regression model in the study explained only 13.9% of the variance in e-tax adoption, further research is needed to identify additional factors influencing digital tax compliance. Future studies should explore the role of trust in digital taxation, assessing whether taxpayers feel secure using online platforms. Examining the impact of government tax policies and enforcement measures on compliance, as well as the feasibility of mobile-based tax filing solutions for informal sector traders, would provide deeper insights. Additionally, analysing the effectiveness of financial incentives in driving e-tax adoption could help refine future policy interventions.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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