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Original Article

Electronic Fiscal Device (EFD) Utilization among Entrepreneurs in Tanzania: Assessing Knowledge, Attitudes, and Challenges

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The adoption of Electronic Fiscal Devices (EFDs) has been a critical policy initiative to enhance tax compliance and revenue collection efficiency. However, the effective utilization of EFDs among entrepreneurs in Mkuranga District, Tanzania, remains a challenge. This study examines the role of knowledge, attitudes, and operational challenges in influencing EFD adoption. Using a descriptive survey research design, data were collected from 136 entrepreneurs through structured questionnaires and analyzed using multiple regression analysis. The findings reveal that attitude significantly influences EFD usage ($B = 0.360$, $p = 0.045$), whereas knowledge has a weaker, non-significant effect ($B = 0.130$, $p = 0.134$). Major barriers to compliance include power outages ($M = 4.15$, $SD = 0.834$), network instability ($M = 4.04$, $SD = 0.851$), and high maintenance costs ($M = 4.03$, $SD = 0.825$). The regression model ($R^2 = 0.440$, $F = 52.188$, $p = 0.000$) indicates that knowledge and attitude together explain 44% of the variation in EFD usage. These findings underscore the importance of targeted training, improved system reliability, and financial incentives to enhance entrepreneurs' engagement with EFDs. The study recommends strengthening education programs, addressing technical challenges, and fostering trust in tax administration to optimize EFD compliance and tax efficiency.

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INTRODUCTION

Efficient tax administration is fundamental to economic growth and development, as it ensures sustainable revenue collection for public services and infrastructure (Magutu, 2017; Umoffong *et al.*, 2020). Electronic Fiscal Devices (EFDs) have been introduced in many developing economies as a mechanism to enhance tax compliance and reduce revenue losses caused by tax evasion (Chijoriga, 2015; Sania, & Yudianto, 2018). These devices automatically record business transactions and transmit data to tax authorities in real-time, thereby improving transparency and accountability (Rahmayanti, & Prihatiningtias, 2020). Countries such as Italy, Brazil, and Kenya have successfully implemented EFD systems, demonstrating improvements in tax compliance and revenue collection (Blanco-Mesa *et al.*, 2024; Duke *et al.*, 2013). However, challenges such as high implementation costs, limited taxpayer education, and technical inefficiencies have hindered their full effectiveness (Kaisi, 2019).

In Tanzania, EFDs were introduced by the Tanzania Revenue Authority (TRA) in 2010 as part of a broader strategy to modernise the tax system and promote business compliance (Geofrey, 2013). These devices were expected to simplify tax reporting, reduce fraudulent activities, and foster a culture of voluntary compliance among entrepreneurs (Eilu, 2018). However, despite regulatory enforcement, many businesses continue to face challenges in adopting and effectively utilizing EFDs, particularly in districts with inadequate infrastructure and limited technical support (Ngowi, & Mmbaga, 2022). The success of EFD implementation depends heavily on entrepreneurs' knowledge, attitudes, and perceived benefits of compliance, making it essential to explore the factors that influence their adoption in different regions (Mnyawi *et al.*, 2022).

Although the use of EFDs is legally mandated in Tanzania, failure to acquire and utilize an Electronic Fiscal Device (EFD) within the stipulated period constitutes a legal offence, punishable by a fine ranging from 200 to 300 currency points, imprisonment of up to three years, or both, as per tax regulatory provisions (TRA, 2024), its reported that entrepreneurs continue to experience significant barriers to their effective utilization (Lubua, 2023; Malima *et al.*, 2021; Mnyawi *et al.*, 2022; Ngowi, & Mmbaga, 2022). Previous studies have highlighted knowledge gaps, negative attitudes, and operational inefficiencies as critical challenges affecting EFD adoption in various regions (Chege, 2010; Chiwango, 2015; Kaisi, 2019). Many entrepreneurs lack adequate training in EFD operations, leading to difficulties in usage and scepticism about their benefits (Ngowi, & Mmbaga, 2024). Additionally, technical challenges such as frequent system breakdowns, power outages, and poor Internet connectivity further complicate compliance (Kaisi, 2019).

Despite the efforts of the TRA to enhance awareness and accessibility, the effectiveness of these initiatives in improving EFD adoption remains unclear. Entrepreneurs often perceive EFDs as costly, complex, and unreliable, which discourages voluntary compliance (Dafi, & Chille, 2023; Eilu, 2018; Ikasu, 2014). Furthermore, studies suggest that attitudinal factors, including trust in the tax system and the perceived fairness of tax policies, significantly influence EFD use (Mnyawi *et al.*, 2022). If these challenges persist, tax compliance rates may remain low, undermining the government's efforts to increase revenue collection and promote a more transparent business environment (Eilu, 2018).

This study examined the utilisation of EFDs among entrepreneurs in the Mkuranga District, focusing on their level of knowledge, attitudes toward compliance, and the operational

challenges they face. By investigating these factors, this study provided empirical insights to inform policy recommendations, training programs, and infrastructure improvements aimed at enhancing EFD adoption and tax compliance in Tanzania.

METHODOLOGY

A descriptive survey research design was adopted, as it enabled the collection of numerical data and statistical analysis to quantify the relationships among variables. This study targeted entrepreneurs using EFDs, focusing on their knowledge, attitudes, and challenges affecting effective utilisation. Krejcie and Morgan's sample size for research activities were used to calculate the sample size. The total population comprised 210 registered entrepreneurs, of which a sample size of 136 was answered and returned by using simple random sampling to ensure equal representation and minimise selection bias (Krejcie, & Morgan, 1970). Data collection was conducted using structured questionnaires that contained close-ended questions to facilitate uniform responses for statistical analysis. The questionnaire focused on key variables, including entrepreneurs' knowledge of EFDs, attitudes towards usage, and challenges in implementation. The questionnaire items were based on Likert-scale responses, allowing for the numerical measurement of key study variables.

To ensure reliability, the test-retest method was applied, in which the questionnaire was administered twice to 12 respondents within a one-week interval. The Shapiro-Wilk test confirmed the normality of data distribution, with p-values above 0.05 for key variables (knowledge: $p = 0.113$, attitude: $p = 0.111$, effective EFD usage: $p = 0.087$), ensuring suitability for parametric analysis. For data analysis, descriptive statistics such as means, standard deviations, and frequency distributions were used to summarize the findings. A multiple linear regression model was applied to examine the relationship between entrepreneurs' knowledge, attitudes, and EFD utilisation. The regression model produced an R-value of 0.663,

indicating a strong correlation between the predictor variables and effective EFD usage. The R^2 value of 0.440 suggests that 44% of the variation in EFD usage can be explained by entrepreneurs' knowledge and attitudes. The ANOVA test further validated the model's significance ($F = 52.188$, $p = 0.000$), demonstrating that these factors significantly impacted EFD adoption among entrepreneurs.

Further regression analysis indicated that attitudes towards EFDs ($\beta=0.360, p=0.010$) ($\beta = 0.360$, $p = 0.010$) had a stronger influence on EFD usage than knowledge ($\beta=0.130, p=0.134$) ($\beta = 0.130$, $p = 0.134$). This finding suggests that improving entrepreneurs' perceptions and reducing their scepticism about EFDs could enhance compliance more effectively than simply increasing their knowledge. Multicollinearity was ruled out as the variance inflation factor (VIF) values were below 2, and the Durbin-Watson statistic of 1.792 confirmed the absence of autocorrelation, ensuring the robustness of the model.

Overall, the use of a descriptive survey research design and multiple regression analysis provides a strong quantitative foundation for understanding the factors influencing EFD adoption among entrepreneurs. These statistical findings offer valuable insights for policymakers and tax authorities in designing targeted interventions to enhance EFD utilization and compliance.

RESULTS

A total of 136 entrepreneurs participated in this study. Regarding gender distribution, 55 (40.4%) of the respondents were male, while 81 (59.6%) were female, indicating a higher representation of female entrepreneurs in the study. In terms of age distribution, the highest proportion of respondents were aged 30–39 years (35 respondents, 25.7%), followed by those aged 40–49 years (32 respondents, 23.6%). Respondents in the 20–29 age group accounted for 25 (18.4%), while those aged 50–59 and 60+ years constituted 23 (16.9%) and 21 (15.4%), respectively.

Regarding educational background, 35 (25.7%) respondents held certificate qualifications, 30 (22.1%) had completed primary education, and 29 (21.3%) had secondary education. Additionally, 24 (17.6%) respondents held diplomas, 14 (10.3%) had bachelor's degrees, and only 4

(2.9%) held master's degrees. These findings suggest that the majority of entrepreneurs have a low-to-moderate level of formal education, which could influence their ability to effectively use EFDs.

Table 1: Respondents' Data: Demographics Information (Note: $n=136$)

	Frequencies	Percentage
<i>Sex</i>		
Male	55	40.4
Female	81	59.6
<i>Age</i>		
20-29 Years	25	18.4
30-39 Years	35	25.7
40-49 Years	32	23.6
50-59 Years	23	16.9
60-Over Years	21	15.4
<i>Level of Education</i>		
Primary School	30	22.1
Secondary School	29	21.3
Basic technician certificate	35	25.7
Diploma	24	17.6
Bachelor	14	10.3
Masters	4	2.9

Entrepreneurs' Knowledge of Electronic Fiscal Devices (EFDs)

The study assessed the extent to which entrepreneurs in Mkuranga District are knowledgeable about Electronic Fiscal Devices (EFDs). The mean score for knowledge of EFD usage was 2.95 (SD = 1.363), indicating that most entrepreneurs have a limited understanding of the devices. However, the mean score for knowledge gained at the time of EFD registration was 3.79 (SD = 1.334), suggesting that the initial training provided by the Tanzania Revenue Authority (TRA) was somewhat effective. Despite this, respondents expressed dissatisfaction with the adequacy of TRA-provided training, as reflected in a mean score of 2.82 (SD = 1.472). These findings align with recent research by (Ngowi, & Mmbaga, 2022), who found that inadequate

education on EFD use remains a critical barrier to adoption, particularly among small business owners in Tanzania. Similarly, (Mnyawi *et al.*, 2022) reported that a lack of proper education and training on EFD usage contributes to non-compliance among entrepreneurs, with many struggling to operate the devices effectively. This is further supported by (Malima *et al.*, 2021), who emphasized that although EFDs have improved tax compliance, gaps in knowledge persist, leading to ineffective utilization and frustration among business owners. The overall grand mean for knowledge-related responses was 2.98 (SD = 0.756), highlighting a general lack of sufficient knowledge among entrepreneurs regarding EFD operations. These findings suggest that targeted education programs and ongoing technical support are necessary to enhance the effectiveness and compliance of EFD.

Table 2: Respondents' Data: Entrepreneurs' Knowledge of Electronic Fiscal Devices (EFDs).
Note: n=136

SN	Item	Mean	SD
1	Do you have enough knowledge of the usage of EFD	2.95	1.363
2	Attain knowledge when registered as an EFD user	3.79	1.334
3	The knowledge provided by TRA on EFD satisfied your need	2.82	1.472
	Grand Mean	2.98	0.756

Source: Field Data, (2025)**The Influence of Entrepreneurs' Knowledge and Attitudes Towards EFD Usage*****Descriptive Statistics of the Variables***

The descriptive statistics provide valuable insights into the levels of knowledge, attitudes, and effective use of Electronic Fiscal Devices (EFDs) among entrepreneurs in Mkuranga District. The data show that, on average, entrepreneurs report relatively high levels of effective EFD use, with a mean of 3.7646 (SD = 0.45). In terms of knowledge, entrepreneurs demonstrate a fairly good understanding of EFDs, reflected by a mean of 2.98 (SD = 0.756), though there is some variation across individuals. However, their attitude towards EFDs was less positive, with a lower mean of 2.8863 (SD = 0.510). These findings align with research by (Ngowi, & Mmbaga, 2022), who found that many

entrepreneurs struggle with EFD adoption due to inadequate training and technical knowledge. Similarly, a study (Kaisi, 2019) highlights that although EFDs have improved tax compliance, knowledge gaps remain prevalent, affecting usability and efficiency. Furthermore, research (Eilu, 2018) revealed that entrepreneurs' attitudes toward EFDs are shaped by their perceptions of tax fairness, system reliability, and ease of use, which aligns with the lower attitude mean observed in this study. Moreover, (Casey, & Castro, 2015) argue that EFDs alone cannot ensure compliance unless they are integrated into a broader compliance strategy that includes training, technical support, and enforcement mechanisms. This finding suggests that improving knowledge and shifting perceptions through education and policy adjustments could enhance entrepreneurs' EFD adoption and compliance levels.

Table 3: Influence of Entrepreneurs' Knowledge and Attitudes Towards EFD Usage Note: n=136

Variable	Mean	Std. Deviation
Effective EFD use	3.765	0.455
Knowledge	2.98	0.756
Attitude	2.886	0.510

Source: Field Data, (2025)**Assumptions of Multiple Linear Regression Analysis*****Missing Data***

An analysis was conducted to identify any instances of missing data, which is a critical step in ensuring the accuracy and validity of subsequent analyses. The investigation confirmed that there were no missing values across any of the items in the dataset, thereby affirming the completeness of the dataset and enabling reliable regression analysis. Ensuring data completeness is crucial in regression analysis, as missing data can

lead to biased estimates and reduced statistical power (Rahmayanti, & Prihatiningtias, 2020).

Normality

To assess the normality assumption, the Shapiro-Wilk test was applied to key variables: knowledge, attitude, and effective use of EFDs. The results showed that all variables had p-values greater than 0.05; specifically, $p = 0.113$ (knowledge), $p = 0.111$ (attitude), and $p = 0.087$ (effective use). These values indicate that the data for all variables do not significantly deviate from a normal distribution, justifying the use of

parametric statistical methods, such as multiple linear regression. The assumption of normality is essential in regression analysis, as violations can affect hypothesis testing and model accuracy (Ikhsan, & Suratman, 2023). These findings align with prior studies on taxpayer compliance and financial behaviour, where researchers have demonstrated that ensuring normality in data distribution enhances the predictive validity of regression models (Irmayani *et al.*, 2023). Additionally, (Sania, & Yudianto, 2018)

emphasized the importance of testing for normality when applying multiple linear regression, as skewed data can distort coefficient estimations. These results suggest that the dataset meets the necessary assumptions for valid multiple linear regression analysis, ensuring that findings related to entrepreneurs' knowledge, attitudes, and use of EFDs are both statistically robust and generalizable.

Normality Test

Table 4: Normality Test: The Influence of Entrepreneurs' Knowledge and Attitudes Towards EFD Usage (Note: $n=136$)

Variable	Shapiro-Wilk		
	Statistic	Df	Sig.
Knowledge	0.979	99	0.113
Attitude	0.979	99	0.111
Effective Use of EFD	0.977	99	0.087

Source: Field Data, (2025)

Relationship between Entrepreneurs' Knowledge and Attitudes and their Effective Use of EFDs

The regression analysis indicates a strong positive relationship between entrepreneurs' knowledge and attitudes and their effective use of Electronic Fiscal Devices (EFDs) in Mkuranga District. The model's R-value of 0.663 suggests a substantial correlation, while the R^2 value of 0.440 implies that approximately 44% of the variation in EFD usage can be attributed to these factors. This significant explanatory power underscores the critical role of knowledge and attitudes in promoting EFD adoption. These findings align with prior research emphasizing the impact of knowledge and attitudes on technology adoption among entrepreneurs. (Hussain *et al.*, 2021) Found that entrepreneurial knowledge and personal attitudes significantly influence decision-making and technology adoption, reinforcing the argument that increasing awareness and fostering positive perceptions are essential. Similarly, (Zubair *et al.*, 2021) established that entrepreneurs with higher knowledge levels and positive attitudes exhibit greater motivation to integrate new business technologies, which aligns with the significant effect size found in this study.

Furthermore, (Bartkowiak *et al.*, 2021) argue that entrepreneurs' attitudes towards knowledge-based systems directly affect their willingness to implement new fiscal and digital tools, further supporting the relevance of attitudes in driving EFD adoption. The study also aligns with the findings by (Blanco-Mesa *et al.*, 2024), who demonstrated that entrepreneurs' subjective norms, behavioural control, and personal attitudes play a crucial role in technology acceptance and fiscal compliance. These findings reinforce the importance of education and awareness programs in promoting EFD compliance, suggesting that government agencies should prioritize knowledge dissemination and attitude-shaping initiatives to enhance entrepreneurs' engagement with fiscal technologies. Moreover, (Bazilevsky, 2018) highlighted that the Durbin-Watson statistic is a crucial measure in least squares regression, as autocorrelation can lead to inflated standard errors and unreliable coefficient estimates. These findings confirm that the absence of autocorrelation enhances the robustness of the regression model, supporting the reliability of its conclusions regarding EFD adoption among entrepreneurs.

Model Summary

Table 4: Model Summary: Relationship between Entrepreneurs' Knowledge and Attitudes

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.663 ^a	.440	.422	.46436	1.792

Source: Field Data, (2025)

ANOVA Model

The ANOVA results confirm that knowledge and attitude significantly influence the usage of Electronic Fiscal Devices (EFDs) in the Mkuranga District. The regression model showed a highly significant F-statistic of 52.188 ($p = 0.000$), indicating that the model is statistically robust. This suggests that the predictor variables of knowledge and attitude explain a substantial portion of the variation in EFD usage. Specifically, the model's regression sum of squares (16.074) represents the variability in EFD usage that can be explained by these factors, whereas the residual sum of squares (20.485) reflects unexplained variation. These findings

align with research by (Umoffong *et al.*, 2020), who found that ANOVA results confirmed a significant influence of tax knowledge and attitudes on compliance behaviour, with an F-value of 233.763 ($p < 0.05$). Additionally, (Tehulu, 2016) found that multiple regression and ANOVA analysis demonstrated a strong link between taxpayers' knowledge and compliance, highlighting the critical role of education and perception in shaping compliance behaviours. These results reinforce the importance of education and awareness programs to improve EFD adoption, suggesting that government agencies should prioritise knowledge dissemination and attitude-shaping initiatives to enhance fiscal compliance.

Table 5: ANOVA Model Knowledge and Attitude

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	16.074	2	5.358	52.188	0.000
	Residual	20.485	133	0.216		
	Total	36.559	135			

Source: Field Data, (2025)

Regression Analysis of Knowledge and Attitude that Influence Usage of EFD

The regression analysis reveals that both knowledge and attitude positively influence the usage of Electronic Fiscal Devices (EFDs) in Mkuranga District, though their impacts differ. The unstandardized coefficient for knowledge ($B = 0.130$) suggests a modest increase in EFD usage with higher knowledge levels, but this effect was not statistically significant ($p = 0.134$). In contrast, attitude has a stronger and statistically significant impact ($B = 0.360$, $p = 0.045$), indicating that positive attitudes toward EFDs significantly enhance their usage. Furthermore, the collinearity statistics confirm the absence of multicollinearity between the predictors, as evidenced by Tolerance

and VIF values within acceptable ranges. These findings align with research by (Lubua, 2023) highlighted that taxpayer attitudes toward EFDs, shaped by trust in the system and enforcement mechanisms, play a crucial role in determining their adoption. Additionally, (Shao, 2020) emphasized the importance of ensuring system reliability and minimizing technical failures to improve users' attitudes toward EFDs, thereby enhancing compliance. These results suggest that policymakers and tax authorities should focus not only on educating entrepreneurs about EFDs but also on improving trust, system reliability, and the perceived benefits of compliance to maximize adoption and usage.

Regression Coefficients

Table 6: Regression Analysis of Knowledge and Attitude that Influence Usage of EFD

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	0.534	0.459		1.162	0.248		
Knowledge	0.130	0.099	0.448	4.642	0.134	0.634	1.579
Attitude	0.36	0.137	0.242	2.621	0.01	0.690	1.449

Source: Field Data, (2025)

Challenges Facing Entrepreneurs in the Practice of the Utilization of Electronic Fiscal Devices

The data presented in Table 6 outlines the challenges facing entrepreneurs in the utilization of Electronic Fiscal Devices (EFDs) in Mkuranga District. The mean scores indicate significant challenges, with the highest mean score of 4.15 (SD = 0.834) for power outages, suggesting that this issue is perceived as the most critical barrier to effective EFD usage. Additionally, network problems (Mean = 4.04, SD = 0.851) suggest that many small and medium enterprises (SMEs) in Africa operate in environments where electricity and internet connectivity are inconsistent, which directly impacts the functionality of EFDs, as revealed in other studies (Eilu, 2018; Kaisi, 2019). and maintenance costs (mean = 4.03, SD = 0.825) are also recognised as substantial challenges, highlighting the technical and financial burdens that entrepreneurs face. This result confirms prior work (Casey, & Castro, 2015) that the costs associated with acquiring and maintaining EFDs can be prohibitive for small business owners, who often operate on thin margins.

The lack of trust in EFDs (mean = 4.01, SD = 0.807) further complicates their acceptance and use. This finding, however, is contrary to (Dafi, & Chille, 2023) who found that there is a notable issue of trust between entrepreneurs and tax authorities. Research indicates that perceived trust in the tax system significantly influences the acceptance of EFDs among business owners. Other notable challenges include system breakdowns (mean = 4.09, SD = 0.803) and the high cost of purchasing devices (mean = 3.96, SD = 0.824), both of which contribute to hesitancy among entrepreneurs. The mean score of 3.95 (SD = 0.819) for the lack of education on EFDs underscores the need for enhanced training and awareness programs. The overall grand mean of 4.025 (SD = 0.820) indicates that entrepreneurs perceive these challenges as significant barriers to effective EFD utilisation. These findings highlight the necessity for targeted interventions to address these issues, ensuring that entrepreneurs in Mkuranga District can effectively implement and benefit from EFD technology.

Table 7: Influence of Entrepreneurs' Knowledge and Attitudes towards EFD Usage. Note: n=136

SN	Item	Mean	SD
1	Network problem	4.04	0.851
2	Maintenance cost	4.03	0.825
3	Lack of education on the use of EFDs	3.95	0.819
4	Lack of trust in EFD	4.01	0.807
5	Power outage	4.15	0.834
6	High cost of purchasing the devices	3.96	0.824
7	Breakdown of the system	4.09	0.803
8	Personal attitudes	3.97	0.798
	Grand Mean	4.025	0.820

Source: Field Data, (2025)

CONCLUSIONS AND RECOMMENDATIONS

The findings of this study confirm that entrepreneurs' knowledge and attitudes significantly influence the adoption and utilization of Electronic Fiscal Devices (EFDs) in Mkuranga District. Multiple regression analysis revealed that attitudes have a stronger impact on EFD usage than knowledge, emphasising the importance of fostering positive perceptions toward EFD compliance. However, despite initial training from the Tanzania Revenue Authority (TRA), entrepreneurs still face knowledge gaps that hinder effective EFD use. Moreover, the study identified critical challenges affecting EFD adoption, including power outages, network instability, high maintenance costs, system breakdowns, and limited trust in the effectiveness of EFD. These barriers discourage compliance and limit tax-collection efficiency. The study also confirmed that there was no significant multicollinearity among the predictor variables, ensuring the reliability of the regression model. Overall, although EFDs remain a crucial tool for improving tax compliance, their effectiveness is undermined by technical, financial, and attitudinal barriers. Addressing these issues is vital for enhancing compliance rates and optimising revenue collection in Tanzania. Based on these findings, the following recommendations were made:

- *Enhancing Education and Training Programs:* The TRA should develop continuous training and support programs tailored to entrepreneurs, ensuring that they acquire practical knowledge and technical proficiency in using EFDs.
- *Improving System Infrastructure:* Addressing power outages and network instability by enhancing technological infrastructure will minimize system failures and disruptions. The government should collaborate with telecommunications companies to improve connectivity in remote areas.
- *Subsidizing EFD Costs:* High initial purchasing and maintenance costs remain a major barrier to adoption. Policymakers should consider subsidies and tax incentives to encourage compliance among small-scale entrepreneurs.
- *Building Trust in EFD Compliance:* The study highlights a lack of trust in EFDs and tax authorities. The TRA should implement transparent and fair enforcement strategies that emphasize the benefits of compliance rather than punitive measures.
- *Strengthening Technical Support Services:* Entrepreneurs face frequent system breakdowns and operational difficulties. Establishing dedicated customer service and rapid-response technical support teams would encourage compliance and reduce frustration related to EFD use.

For further studies, this paper recommends that studies should explore the longitudinal impacts of EFD adoption, evaluating how continued education and policy interventions affect compliance behaviour over time.

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