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FROM DIGITAL PAYMENT TO COMPLIANCE: INVESTIGATING THE MODERATING ROLE OF TAX EDUCATION IN ELECTRONIC BILLING SYSTEM

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Abstract

Digital transformation in the tax system has created significant opportunities to improve the efficiency and effectiveness of tax collection. This study aims to examine the Moderating Role of Tax Education in Electronic Billing Systems through digital payments for compliance. This is very important to ensure that taxpayers comply with the required tax obligations in order to achieve the predetermined revenue targets. In this case, the taxpayer in question is the Regional Apparatus Organization (OPD) responsible for the implementation of regional government tasks under the Regional Head. This research uses a quantitative methodology with a survey approach. Data were collected through questionnaires distributed to all treasurers of OPD organizations in Solok Regency and City, and 50 samples were obtained from this number. The data were processed using SEM-PLS analysis through the help of Smart-PLS. The results showed that tax socialization and digital payments have a significant effect on taxpayer compliance. However, tax socialization does not moderate the relationship between digital payments and taxpayer compliance. This is due to the tendency of taxpayers to choose digital payments that are based more on considerations of transaction convenience and efficiency, not because of the direct influence of tax socialization that has not specifically encouraged compliance through digital media. The coefficient of determination of 0.571 indicates that 57.1% of the variation in taxpayer compliance can be explained by the digital payment variable, tax socialization, and the interaction between the two in the model. Thus, this model has a fairly good predictive ability in explaining the factors that influence taxpayer compliance. Meanwhile, the remaining 42.9% is explained by other factors outside the model, such as the level of understanding of tax regulations, tax authority supervision, the quality of tax administration services, and the use of technology in the tax reporting system. These findings emphasize the importance of a more holistic approach in improving taxpayer compliance, including increasing digital literacy and trust in the tax system.

Keywords: Tax Education, Electronic Billing System, Digital Payment, Tax Compliance, Transformation of Tax System

Introduction

Digital transformation has revolutionized various aspects of life, including taxation. The digitization of the payment system, marked by the presence of e-payment and e-billing, has changed the face of interaction between taxpayers and tax authorities. This change not only has an impact on the technical efficiency of the tax collection system, but also on taxpayer compliance behavior. In this context, taxpayers' understanding of electronic systems and their tax literacy are crucial factors in determining the extent to which technology can effectively increase tax revenue (Alm & Torgler, 2011).

Along with the increasing use of electronic systems in tax collection and payment, new challenges arise, especially in developing countries such as Indonesia. Despite the increasing adoption of technology, many taxpayers still do not understand how electronic billing systems work, which ultimately impacts compliance levels. Therefore, tax education is important as a means to bridge the tax information and digital literacy gap. Tax education is not just about formal information delivery, but also involves an educational approach that is sustainable and adaptive to technological change (Saad, 2014).

In many studies, tax education has been shown to have a significant role as a moderator in strengthening the relationship between system innovation and taxpayer compliance. Adequate education can increase the perceived ease of use and benefits of electronic systems, thereby encouraging their voluntary use. On the other hand, lack of understanding can trigger resistance, misperceptions and even non-compliance. Therefore, it is

important to investigate in more depth how tax education plays a moderative role in the context of electronic billing systems (OECD, 2021).

The electronic billing system is a key component in the digital tax ecosystem. It is designed to replace manual processes with data-driven automation methods, allowing tax authorities to access real-time transaction information. This provides benefits in the form of administrative efficiency, transaction transparency, and reduction of potential tax leakage. However, the success of this system is highly dependent on the active involvement of taxpayers and their ability to understand the digital mechanism (Gupta & Keen, 2015).

The implementation of an electronic billing system that is not accompanied by an adequate educational strategy can actually create confusion among taxpayers, especially for MSME players and individuals who have a low level of digital literacy. This is where the urgency of tax education as a moderator lies. The role of education is no longer just to convey technical information, but also to shape a positive attitude towards change. Technology-based educational interventions such as learning videos, e-filing simulations, and interactive applications have been proven to increase taxpayers' trust and willingness to use digital systems (Palil & Mustapha, 2011).

Furthermore, the phenomenon of psychological tax compliance is not only influenced by the threat of sanctions, but also by intrinsic factors such as perceptions of fairness, trust in institutions, and understanding of obligations. In the slippery slope framework (Kirchler et al., 2008), tax compliance is divided into two, namely voluntary compliance and forced compliance. Tax education plays an important role in building voluntary compliance through increasing understanding and trust in the system. Therefore, the effectiveness of an electronic billing system is not solely determined by its technological sophistication, but also by the quality of the accompanying educational interventions.

Based on the problems that have been described and from several descriptions of previous researchers who have different results, the researchers are interested in examining whether there is an effect of the e-Billing system and tax socialization on taxpayer compliance. The difference between this research and the research above is that this research is with the object of treasurers in all OPDs in Solok City.

Research on the moderating role of tax education in the digital context is still relatively limited, especially in the Southeast Asia region. Most studies still focus on the technical and administrative aspects of electronic billing systems, without looking at how the cognitive and affective elements of taxpayers affect the successful implementation of these systems. Therefore, this study aims to fill this gap in the literature by investigating the role of tax education as a moderator in the relationship between e-billing systems and tax compliance in Indonesia.

Furthermore, the approach used in this study is based on the Technology Acceptance Model (TAM) developed by Davis (1989), which states that perceptions of the usefulness and ease of use of technology determine users' intention to adopt it. Tax education is hypothesized to strengthen these perceptions, thereby increasing the adoption of electronic billing systems. In this model, tax education serves not only as an independent variable, but also as a moderator that strengthens the relationship between digital system adoption and compliance behavior outcomes.

With increasing global pressure on the transparency and efficiency of the tax system, it is important for tax authorities to not only focus on the technological aspects, but also on communication and education strategies. This research contributes to a more comprehensive understanding of how tax education can be strategically integrated in digital system reforms, with the ultimate goal of increasing sustainable and participatory tax compliance. Through this approach, it is hoped that the government can develop tax policies that are more inclusive, data-driven, and responsive to people's needs.

In concluding this section of the introduction, it can be emphasized that e-billing systems and tax education are two sides of the same coin. Without proper education, digital systems risk becoming exclusionary and counterproductive tools. Conversely, with strategic and structured tax education in place, e-systems can be a catalyst for transformation towards higher compliance and a more modern tax system. Therefore, it is important to investigate how the interaction between these two factors can foster a sustainable culture of tax compliance in the digital era.
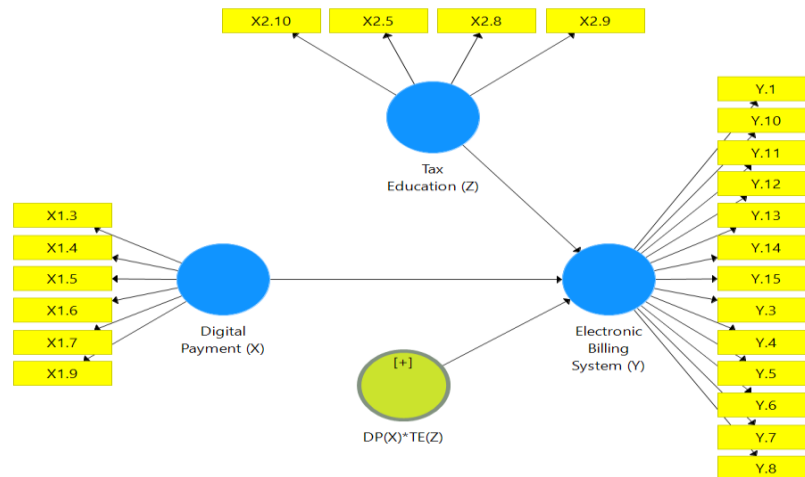
Figure 1
Research Model

Method

This study uses a quantitative approach with the aim of examining the effect of digital payments on taxpayer compliance, as well as the moderating role of tax education in the relationship. The quantitative approach was chosen because it is able to measure the relationship between variables objectively based on numerical and statistical data. This research was designed in the form of a survey study, where data was collected through the distribution of structured questionnaires to predetermined respondents. The focus of the research is on Regional Apparatus Organizations (OPD) within the Solok Regency and City Governments as the main subject, given the strategic role of OPD in financial management and implementation of tax obligations.

The population in this study were all OPD treasurers in Solok Regency and City who served as the party responsible for reporting and paying agency taxes. The sampling technique was carried out by census, taking into account the limited population and relevant to the research objectives. From the questionnaire distribution process, a total of 50 respondents were obtained who filled in the instrument completely and validly. Inclusion criteria included treasurers who were active during the research period and directly involved in the implementation of tax payments using the digital system established by the local government.

Table 1 Definition of Research Variable

Variable	Description
Dependent Variable	
Electronic Billing System (Y)	The level of compliance of the OPD treasurer with tax obligations which includes timely reporting, payments according to amounts, and completeness of documentation.
Independent Variable	
Digital Payments (X)	The level of use of electronic-based tax payment systems by OPD treasurers reflects the convenience, efficiency, and speed of tax transactions. It is measured through respondents' perception of the digital payment system used.
Moderating Variable	
Tax Education (Z)	Efforts made by the government or tax authorities in socializing and educating taxpayers about tax obligations, including the use of digital systems and understanding of tax regulations.

The research instrument in the form of a questionnaire consists of several parts: first, the measurement of the digital payment variable, which includes the perceived ease, speed, and efficiency of the electronic tax payment system; second, the tax education or tax socialization variable, which is measured based on the level of information receipt, training, and understanding of tax regulations; third, the taxpayer compliance variable, which is measured through indicators of timely reporting, compliance with payment amounts, and transaction

documentation. All items were measured using a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree", to enable robust statistical analysis.

The collected data were analyzed using Structural Equation Modeling-Partial Least Squares (SEM-PLS) technique with the help of SmartPLS software version 3.0. This technique is used because it is suitable for testing the relationship between latent variables and models with moderation complexity. Testing is carried out in two stages, namely testing the measurement model (outer model) to assess the validity and reliability of constructs, and testing the structural model (inner model) to assess the relationship between variables. The analysis also includes testing the coefficient of determination (R^2), path coefficient significance, and moderation interaction using a two-stage analysis approach. The results of the analysis are the basis for answering the hypothesis and drawing conclusions about the influence of the variables studied.

Results and Discussion

This study involved 50 respondents who were treasurers of Regional Apparatus Organizations (OPD) in Solok Regency and City. All 50 questionnaires were distributed directly to respondents and successfully collected back in complete condition. Based on the structure of the analysis model, latent variables are formed as linear combinations of their indicators. In this approach, the structural model (inner model) serves to explain the relationship between latent variables, while the measurement model (outer model) describes how these variables are constructed from indicators through estimating their respective weights. Validity testing is carried out to ensure that the instrument is able to accurately measure the intended concept, with convergent validity, discriminant validity, and Average Variance Extracted (AVE) values as a reference. Meanwhile, reliability is evaluated to determine the extent to which the instrument has consistency in capturing constructs and the stability of respondents' answers to the items given.

Table 2 Respondent Demographic Data

Information	Description	Number	Percentage (%)
Age			
	20-29 Years	9	18%
	30-39 Years	23	46%
	40-49 Years	18	36 %
	50-59 Years	0	0 %
Gender			
	Male	15	30%
	Female	35	70%
Last Education			
	Senior High School	2	4%
	Associate Degree (D3)	5	10%
	Bachelor's Degree (S1)	41	82%
	Master's Degree (S2)	2	4%

Source: Data Processed, 2024

Based on data on the characteristics of respondents, it is known that OPD treasurers in Solok Regency and Solok City are dominated by women, with a total of 35 people (70%), while men totaled 15 people (30%). In terms of age, most respondents were in the age range of 30-39 years as many as 23 people (46%), followed by ages 40-49 years as many as 18 people (36%), and ages 20-29 years as many as 9 people (18%), while there were no respondents aged 50-59 years. This shows that the majority of treasurers are at a productive age, relatively mature in terms of experience and understanding of technology. Seen from the educational background, most respondents have the latest education S1 (Bachelor), namely 41 people (82%), then D3 as many as 5 people (10%), SMA / SMK as many as 2 people (4%), and S2 as many as 2 people (4%). Thus, it can be concluded that the majority of OPD treasurers have high educational qualifications, especially at the S1 level, which reflects a good level of competence in managing regional administration and finances.

Table 3 Outer Loading

Latent Variable	Code	Indicator	Outer Loading	AVE
Digital Payment	X3	I feel comfortable using digital payment methods.	0,828	
	X4	Digital payments make it easier for me to do tax transactions.	0,816	
	X5	I have a fair understanding of how to use digital payment applications.	0,751	0,845
	X6	Digital payments speed up the transaction process.	0,754	
	X7	I believe that digital payment systems are safe to use.	0,691	
	X9	I prefer digital payments over manual methods.	0,643	
Electronic Billing System	Y3	I rarely experience errors when using e-billing.	0,618	
	Y4	E-billing helps me avoid late tax payments..	0,741	
	Y5	Tax information in the e-billing system is presented clearly.	0,818	
	Y6	I feel confident in the accuracy of the e-billing system.	0,698	
	Y7	I am more efficient in paying taxes using the e-billing system.	0,728	0,468
	Y9	E-billing makes tax reporting easier.	0,695	
	Y10	The features in the e-billing system support my reporting needs.	0,716	
	Y11	I am satisfied with the use of the e-billing system.	0,770	
	Y12	E-billing improves my compliance in paying taxes.	0,667	
	Y13	The e-billing system helps me store proof of payment digitally.	0,627	
Tax Education	Z1	I have attended tax socialization or training from the Directorate General of Taxes or other institutions.	0,845	
	Z3	Tax education improves my understanding of tax obligations.	0,845	0,645
	Z4	Tax education makes me more compliant in paying taxes.	0,906	

Based on the results of factor analysis in Table 3, all indicators show outer loading values that are generally above the minimum threshold of 0.70, which indicates adequate validity of indicators in measuring their respective constructs. In the Digital Payment variable, most indicators have high outer loading, with the highest value of 0.828, and only two indicators (X7 = 0.691 and X9 = 0.643) are slightly below the ideal threshold but still acceptable in an exploratory context. The Electronic Billing System variable shows a diversity of outer loading values, with several indicators (such as Y3 = 0.618 and Y13 = 0.627) falling below 0.70, as well as an AVE value of 0.468 which indicates that this construct has low convergent validity and needs further attention. Meanwhile, the Tax Education variable shows excellent results, with a high outer loading above 0.84 and an AVE value of 0.645, indicating that the indicators consistently and strongly reflect the tax education construct. Overall, these results support that most indicators are valid in measuring the construct under study, although further evaluation of some indicators with low loading values is needed.

Table 4 Cronbach's Alpha and Composite Reliability

	Composite Reliability	Cronbach's Alpha
Digital Payment (X)	0,884	0,842
Electronic Billing System (Y)	0,919	0,905
Tax Education (Z)	0,876	0,813

Source: Data processed using SmartPLS version 3.0, 2025

Based on Table 4, all variables have Cronbach's Alpha values above 0.70, indicating that each indicator consistently measures the variable in question with good reliability. In addition, the Composite Reliability value of each variable also exceeds 0.80, indicating that each construct has a high composite consistency and a reliable and accurate measurement instrument. In assessing the internal consistency of a construct, Cronbach's Alpha and Composite Reliability are commonly used measures. Composite Reliability is considered more representative because it takes into account the actual loading value of each indicator, while Cronbach's Alpha only provides a lower bound estimate assuming the similarity of indicator loading.

Table 5 Hypothesis Results

Hypothesis	Original Sample (O)	T Statistics ($|O/STDEV|$)	P Values	Result
Tax Education (Z) -> Electronic Billing System (Y)	-0,121	1,079	0,281	Rejected
Digital Payment (X) -> Electronic Billing System (Y)	0,528	4,320	0,000	Accepted
X*Z -> Electronic Billing System (Y)	0,314	2,397	0,017	Accepted

Based on the results of hypothesis testing shown in Table 5, the first hypothesis which states that Tax Education affects the Electronic Billing System shows insignificant results. The p-value of 0.281 is greater than the significance level of 0.05, and the T-statistics value of 1.079 is below the critical limit of 1.96. Thus, this hypothesis is rejected. These results indicate that directly, tax education has not provided a strong enough influence in encouraging the use of electronic billing systems. This is in line with the findings of Saad et al. (2014) who showed that although tax education is important, its impact is only significantly felt when combined with the right implementation strategy and technology.

In contrast, the second hypothesis that examines the effect of Digital Payment on Electronic Billing Systems obtained significant results. With a p-value of 0.000 and T-statistics of 4.320, this hypothesis is accepted. The original sample value of 0.528 indicates a positive and moderately strong influence of digital payments on the use of electronic billing systems. This finding suggests that the adoption of digital payment methods plays an important role in encouraging the use of electronic systems by taxpayers. The technological infrastructure support and convenience offered by digital payment systems also strengthen this argument, as Ozkan and Kanat (2011) argue that the success of digital public service systems is strongly influenced by the ease and speed of transactions offered.

Interestingly, the third hypothesis that tests the interaction effect between Tax Education and Digital Payment (X*Z) on Electronic Billing System shows significant results with a p-value of 0.017 and T-statistics of 2.397. This indicates that tax education is able to strengthen the effect of digital payments on electronic billing systems. This means that although tax education is not significant directly, its role as a moderator is important in strengthening the relationship between the main variables. This result is consistent with the interactional approach in moderation models, as described by Baron and Kenny (1986), where the moderating variable does not necessarily have a direct effect on the dependent variable, but strengthens the relationship between other variables in the model.

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Table 6 R-Square

Variable	R Square
Electronic Billing System (Y)	0,571

Source: Data processed using SmartPLS version 3.0, 2025

Based on Table 6, the R-Square (R²) value for the Electronic Billing System variable of 0.571 indicates that 57.1% of the variation in the use of the e-billing system can be explained by the independent variables in the research model. This value is in the moderate to strong category, which indicates that the model has a fairly good predictive ability. Thus, the factors included in the model, such as Digital Payment and Tax Education, make a significant contribution in explaining the level of adoption and utilization of electronic billing systems by taxpayers. The remaining 42.9% is likely influenced by other variables not included in this model. Based on these findings, this study can serve as a foundation for future research to include additional relevant variables to increase the R-Square value and strengthen the research model.

Table 7 Goodness of Fit

	Saturated Model
SRMR	0,153
Chi-Square	693,708
NFI	0,400
rms Theta	0,288

Source: Data processed using SmartPLS version 3.0, 2025

Based on the Goodness of Fit results in Table 7, the Standardized Root Mean Square Residual (SRMR) value of 0.153 indicates that the model has not achieved a good level of fit, as the recommended SRMR value is below 0.08 to indicate adequate model fit. The Chi-Square value of 693.708 reflects the significant difference between the estimated model and the actual data, which also indicates that the model is not optimal. In addition, the Normed Fit Index (NFI) value of 0.400 is well below the ideal threshold of 0.90, indicating that the overall model fit is low. The RMS Theta value of 0.288 also exceeds the 0.12 threshold commonly used in reflective models, indicating that the model still has weaknesses in terms of indicator reliability. Thus, the data in Table 7 indicate that the model used in this study has not shown a good level of fit and requires further structural improvements or model revisions.

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