

ENHANCING THE ZAKAT FINANCIAL ASSISTANCE MODEL USING POLYTOMOUS LOGISTIC REGRESSION: A CASE STUDY AT UITM PERLIS BRANCH DURING THE COVID-19 PANDEMIC

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ABSTRACT - Zakat, Sedekah, and Wakaf Unit (ZAWAF) of UiTM Perlis Branch has modified its zakat application process to an efficient online system during COVID-19. However, the unit faces challenges in accurately ensuring appropriate zakat assistance is provided. Therefore, this study conducted Polytomous Logistic Regression to determine the appropriated amount for eligible student who received zakat by using SPSS software. The research methodology involves collecting zakat application data from UiTM campuses in Arau over a period of four semesters, from March 2020 to October 2021. In addition to the family size, gender, state, faculty, programme, semester, CGPA, student status, and other factors, the study expands the analysis by including variables of household income groups (B40, M40, T20). The data splitting for test 2 (2semesters training set and 2 semesters test set) was chosen as the best fit model considering a few statistical analyses. The result shows Mother's income, Household size, Faculty, Semester, Zakat receiver, and Head's family income were statistically significant with an overall percentage correct accuracy of 71.2%.

Keywords: Polytomous logistic regression, zakat, income classification, zakat amount

1. INTRODUCTION

This study addresses the challenges faced by the Zakat, Sedekah, and Wakaf Unit (ZAWAF) of UiTM Perlis Branch in distributing zakat financial assistance to students during the COVID-19 pandemic. They have transitioned to an online application process but face problems in reviewing applications and determining the appropriate amount of assistance. To overcome this, the study aims to develop a new zakat financial assistance model using polytomous logistic regression. The model will integrate student profiles and parent household income classes to identify eligible students and predict the amount of zakat assistance. This will ensure a more efficient and accurate assessment process, allowing eligible students to receive timely and adequate support. By considering the specific circumstances and economic impact of the pandemic, the model aims to facilitate fair and effective distribution of zakat assistance among UiTM Perlis Branch students.

2. METHODOLOGY

This study aims to develop a polytomous logistic regression model to determine the amount of zakat assistance received by eligible students. The study consists of five stages: data acquisition, data preparation and processing, model development, model evaluation, and model application. The data used in the study were obtained from the Unit Zakat, Sedekah, and Wakaf (ZAWAF) UiTM Cawangan Perlis, including 16 variables such as amount of zakat, gender, state, faculty, program, semester, CGPA, and others. The data were processed and cleaned, and the relationship between variables was examined using statistical tests. A polytomous logistic regression model was then developed to predict the amount of zakat assistance. The model will be evaluated based on various statistical criteria such as goodness of fit, likelihood ratio test, pseudo R-squared, specificity, sensitivity, accuracy, AIC, and BIC. Finally, the model will be applied to predict the zakat application for the upcoming semester.

3. RESULTS AND DISCUSSION

Based on the test set, the best-fit model produced a specificity value of 81.28% and an overall percentage accuracy of 71.4%. This model can effectively predict the eligibility and amount of zakat assistance for the next semester. The polytomous logistic regression model with six significant independent variables was used, and the outcomes of RM100, RM200, RM300, and RM0 (representing not qualified) were predicted, with RM400 as the reference category. The model's quality was evaluated using a confusion matrix (classification table), which showed that the

model correctly classified the amount of zakat assistance for eligible students with 71.2% accuracy. This level of accuracy can be considered satisfactory.

4. NOVELTY OF RESEARCH / PRODUCT

Previous studies have mainly utilized binary logistic regression to determine eligibility or factors related to zakat recipients, this study expands the analysis by incorporating multinomial logistic regression to predict the appropriate amount of zakat assistance. For example, Fuadah Johari et al. (2015) used binary logistic regression to determine zakat distribution towards new converts, while Ahmad Fahme and Mohd Faisol (2018) examined income levels of zakat applicants in Kelantan. In contrast, the use of multinomial logistic regression in zakat distribution is relatively unexplored. Ahmad Najim et al. (2022) applied multinomial logistic regression to predict air quality levels, achieving an accuracy of 84%. Mohammad M. Fage Hussein (2022) used multinomial logistic regression to analyze car accident types and achieved a 67% accuracy in classification. Mazanec et al. (2023) utilized multinomial logistic regression to analyze travel behavior during the COVID-19 pandemic, achieving an accuracy of nearly 70% in predicting modes of transport. Furthermore, the study incorporates various independent variables, including family size, gender, state, faculty, program, semester, CGPA, student status, household income groups (B40, M40, T20), as well as other factors. This expanded analysis adds depth and complexity to the study, allowing for a more accurate determination of zakat assistance based on multiple factors.

5. CONCLUSION

In conclusion, this study developed a polytomous logistic regression model to predict the appropriate amount of zakat assistance for eligible students. Significant variables such as mother's income, household size, faculty, semester, zakat receiver status, and head's family income influenced the zakat assistance. The selected best-fit model achieved a 71.2% overall accuracy in predicting the assistance amounts. Implementing this model and an online system can enhance the accuracy and efficiency of zakat distribution. Future research can expand the model and conduct longitudinal studies to improve the effectiveness of zakat assistance for eligible students.

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