

UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

**APPLICATION OF DYNAMIC PROGRAMMING FOR STUDENTS
FINANCIAL PLANNING**

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IN THE NAME OF ALLAH, THE MOST GRACIOUS, THE MOST MERCIFUL

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ABSTRACT

Managing a financial plan might be known to everyone, but there is still a lack of systematic allocation and expense calculation among youths. Financial planning is not merely a process to achieve financial goals, but it is a necessary step in determining a person's requirements in terms of money. The idea of proposing this study is because it is proven by numerous numbers of research papers that Malaysian has a weak hold on managing their finances and a high number of retirees has insufficient fund for retirement. Therefore, finances need to be handled from a youthful age. In addition, based on past studies made by previous researchers, there are bunch of financial studies using Goal programming, Linear programming, Fuzzy Application, Stochastic programming, and Dynamic programming. However, there is no previous study made for students' financial planning using Dynamic programming (DP) in optimizing money allocation and utilizing spending based on selected attributes annually. This study appries also about other financial studies from various area such as retirement as a guide into financial studies but focuses on the execution of DP model for FSKM students in Universiti Teknologi MARA branch Negeri Sembilan campus Seremban 3 as data obtained of money allocation and level of spending through an online survey. This study is divided into two objectives, which are: to investigate financial behavior of tertiary level students using online survey and to formulate a DP approach to construct financial guidelines for optimize students' expenses using forward recursive. The budget allocation and spending are analyzed using pie charts and bar charts before adding into forward recursive based on DP model. Calculation is made quarterly where each quarter covers for a period of three months. Total allocation is then divided into four quarters before subtracting with 12 attributes which is significant to students' lifestyles. Reasons to dispose of three attributes is discussed in Chapter 4. This study has produced a perfect budget and spending allocation especially for students as they need to manage their funds very well within a fixed period. Result analysis using Excel Solver is then performed to acquire optimal value for Balance. Six students that fits the criteria of analysis is later chosen and from that, one best student was chosen. From this one best student, three cases were further performed varying the parameter during validation of results using Sensitivity Analysis. First case where value of μ is decreased and ω is increased from its original value, Case 2 where μ and ω were

set to be equal, and third case where value of μ is increased and ω is decreased from its original value. From these three cases, it is observed that the DP model is stable and valid to be performed for other analyses. Mathematical model is verified. Hence, students have a better budget planning with an extensive model and calculation in helping to utilize finances better in the future. The proposed DP model can also be used as a base model for future modified study concerning the same area of problem and it can also be used for allocations for other attributes from other resources.