

Abstract

Corruption is a social vice that has also penetrated the institutions of higher learning just like other sectors of the economy. Corruption distorts the institutional fabrics and undermines the institutional management and governance while compromising the professional code of regulations and ethics. This study adopts the Lotka-Volterra approach to develop a model that is used to analyze the dynamics of corruption between the academic staff and students in an institution of higher learning. The Lotka-Volterra equations describes a predator-prey relationships in an ecosystem. The predator and prey competes for resources in the same habitation. Four first order non-linear ordinary differential equations were used to analyze this competition; two for the predator and the other two for the prey population. In our case, the academic staff and students are considered as the predator and prey interchangeably. These equations are further modified to describe the corruption patterns in the institution. A deterministic compartmental model consisting of corrupt academic staff, students and their non-corrupt counterparts was formulated and analyzed. The steady states were determined and their stabilities investigated using the trace and determinant conditions as well the Lyapunov criterion. A bifurcation analysis of the system was further assessed. The model exhibited three feasible steady states that are both locally asymptotically stable (LAS) and globally asymptotically stable (GAS). The numerical simulations were obtained with the aid of MATLAB and using the assumed values of the initial conditions and parameters. The variation of corrupt academic staff with time showed an increasing trend while the variation of corrupt students with time showed an increasing trend while the variation of corrupt students with time showed a decreasing behavior. Subsequently, the variation of corrupt academic staff against corrupt students indicated that the number of corrupt students declined whereas the number of corrupt academic staff increases. This dynamics of corruption among the academic staff and students implied that more focus should be geared towards the academic staff in attempt to reduce the rate of corruption.