

Mathematical Model of High School Dropout: Parental Involvement and Peer Interactions

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In 2012, more than 3 million students dropped out from high school. At this pace, we will have more than thirty million Americans without a high school degree by 2022. Recent data (The National Center for Education Statistics, 2012) shows increasing trends in dropout rates. This problem is a result of complex social processes that affects the future of our young men and women. Despite the policies and recommendations by school boards and governments, the dropout has been unmanageable by many school districts.

In this research, we have developed and analyzed a mathematical model that includes multiple interacting mechanisms that affects the dynamics of dropouts in high schools. The model analysis suggests social influences on and off campus and parental guidance are two factors that can significantly affect the dropout rates in high schools. Furthermore, parental guidance is found to be a significant factor only under a low level of negative social influence within the school. However, if the negative social influence increases beyond a critical value, parental involvement becomes negligible.