

Chapter 16

Crafting Effective Education Policies With Data Science Tools and Techniques

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ABSTRACT

The digital world holds vast data, from historical records to current affairs, that can be analyzed and transformed into knowledge. In education, data science helps educators to tailor instructions and improve the efficiency and outcome of students by introducing new strategies and personalized learning plans. This chapter aims to bring out the role of data science in the discipline of education and how data science helps in effective policy-making through statistical analysis of student academic performance, data visualization and resource allocation, so that we can ensure that funding and support are directed to the areas needed most. This chapter aims to identify the obvious challenges associated with the current educational reforms and the way data science can help to address those issues by giving a clear perspective of policy-making with data-driven decisions, its impact on the betterment of the individual student. It is stressed that innovative decisions to existing problems with the help of data science can increase literacy levels nationwide.

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1. INTRODUCTION

Governments across the globe consider education policy to be of great importance. Increasing global pressures are leading to greater scrutiny of the outcomes of education policies and their impacts on social citizenship and economic growth.

A collection of rules, beliefs, and principles that specify the structure and operation of an educational system is known as educational policy. It covers the objectives of the educational system, strategies for achieving them, progress tracking, and student learning outcomes, instructional strategies, and the policy-making process and those involved.

The educational policy serves as the cornerstone of the educational system, acting as a set of guidelines that directs the actions and choices of those involved in education. It encompasses more than mere regulations; it embodies a vision for the future of education, aimed at nurturing individual potential and enhancing social cohesion. Various stakeholders, including government bodies, educational institutions and sometimes non-profit organizations work together to formulate educational policies.

Creating educational policies is a difficult process that calls for investigation, discussion, and frequently some trial and error. Diverse viewpoints are brought to the table by stakeholders like parents, students, government representatives, and educators. Generally, the procedure proceeds as follows: issue identification, policy proposal drafting, public consultation, implementation, and review.

2. POLICY MAKING

Because of the characteristics of the educational system and the changes in education, studies on the creation of educational policies consistently highlight the intricate and multidimensional nature of this process. The education system's clear connections to the socioeconomic structure are among its most significant features. Consequently, any modifications to policies involve socio-political and economic elements in addition to technical considerations (Haddad et al, 1995). For instance, there will be strong resistance to any efforts to modify the system, as certain groups fear it may hinder their children's chances for social or economic advancement. Therefore, the concept of reform as a method of democratization is primarily rooted in politics. Additionally, there exists a complex network linking the economy and the education system, with schools seen as potential solutions to various economic challenges. A significant portion of the drive for policy changes stems from this belief.

The educational system is actually a complex web of interconnected institutions that are arranged both vertically and horizontally. Any one component's policy decision can have a significant impact on the system as a whole. For example, education appears to be a matter of public concern and almost everyone feels qualified to express an opinion on the subject. As a result, formulating policies entails striking a balance between a variety of competing needs and enlisting the support—or at the very least, tolerance—of the many diverse societal groups with an interest in education.

2.1. Policy Planning Processes

Policy planning to the satisfactory level of various stakeholders of educational institutions involves many stages which are

Analysis of the existing situation

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