

Optimal Path of Education Based on Individual Differences of Students and Hysteresis of Education

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Abstract: The problem of educational hysteresis was proposed decades ago, but effective solutions have been rare. In this paper, an analysis of the causes and effects of educational hysteresis, along with finding the correlation between individual differences of students with educational development has been done. Based on the analysis, the hysteresis of education originates from timeline conflicts, reform difficulties, and teachers' acceptability towards new content. These would result in losing the purpose of education: helping students prepare for future careers and maintain equality. This essay also points out the differences in children between different generations, and how students can change in many different aspects like thinking and values. Based on these conclusions, this paper argues that the government should constantly update its system and set specific reform goals for different areas. Teachers should focus on creating opportunities from time to time, incorporating innovations in teaching methods. In addition, teachers should pay attention to the situation of students and achieve personalized teaching.

Keywords: Hysteresis, Individual Differences, Educational Reforms.

1. Introduction

The education system is regarded as one of the most important systems in a country by all governments throughout history as it helps students better adapt to and live in society when they become adults. Therefore, a suitable education system with updated helpful content is necessary.

However, keeping an updated and completed education system is not something easy to achieve. As mentioned by Ogburn back in 1922 in his book 'Theory of Social Change', even with regular education system reform and constant alternations made to textbooks, such methods do not catch up with the rapid advancements in the societal conditions, known as hysteresis of education [1]. Though this is not a very new concept, there have been rare studies and research done on the reasons, problems, and potential solutions to the hysteresis of education. Thus, by explaining the reasons and problems of hysteresis, understanding the impact of how changes in individuals could affect education development, and giving potential solutions, the following study will try to create a deeper understanding of the concept while providing an optimal path.

2. Hysteresis of Education

For the first part, exploring the concept of Hysteresis of Education will be done before moving on to the solutions by breaking down into two following questions: The reasons for this phenomenon and the problems it raises for the world.

2.1. Purpose of Education

Before going in-depth, it is important at the beginning to understand the ideal purpose of education, demonstrating the necessity and urgency of maintaining an updated system.

Firstly, education is supposed to help younger generations to be prepared for their entry into society when they grow up. Every school content, whether it is academic or skills, is targeted to help students be able to adapt to society when they graduate. In other words, it can be regarded as an investment in preparing for a later career.

Secondly, education is also an approach to minimize the rich-poor gap, ideally from the perspective of the government, reaching the macroeconomic goal of equal distribution of income and wealth. The education system puts every student in schools, creating equal competition for the opportunity to gain higher-level educational resources. Holding a higher diploma would on average result in a much higher income: On an annual basis, median earnings for bachelor's degree holders are \$40,500 or 86 percent higher than those whose highest degree is a high school diploma [2]. In other words, education engenders relatively strong financial support behind students coming from poorer districts when they grow up, diminishing the rich and poor gaps.

2.2. Reasons behind Hysteresis in Education

2.2.1. Timeline Conflict

Students in schools are learning based on the syllabus and textbooks of the course. During the compilation, documents are written mostly based on what happened in the past, focusing on the previous events, discoveries, and histories. Also, these materials are adjusted every three or five years, making the latest discoveries and events that happened unable to be put into the textbooks. Furthermore, the fundamental use of education should be targeting the future, finding ways to help them years later when entering career paths and becoming adults. In summary, the schools are using past experiences and facts-based books to teach the students how to fit into the future society. This would diminish largely the utility of education, as some contents students learned in classrooms cannot be applied to real-life problems anymore. For example, at the end of the 20th century in China, schools had courses that taught students how to use an abacus in mathematical calculations. For no doubt, the abacus had been useful when calculators were not widely introduced, and people had been using it for thousands of years. However, as more and more advanced technology appeared, the abacus gradually disappeared from daily life. Thus, the skill of calculating on an abacus became less and less applicable. This time lag between what and when students learn with when they apply them is the hysteresis of education.

2.2.2. Educational Reforms

Educational reforms are common and constantly imposed by the government. The goal of it is to improve the quality of education based on the current public education system across a national level. However, problems and difficulties occur during reforms, which continues the hysteresis of education instead of mitigating the negative impacts.

First, educational reforms are a long-term project. It can take many years due to its huge scope, and it is a grand project that needs time for a gradual and smooth shift. Thus, reforms are always a phase behind the changes in the society. For example, the Hong Kong 2002 reform took 10 years for a complete shift towards a better system that fits the 21st-century society, replacing the old UK system of education. However, when this education reform was done, it was in 2012 already, with a 10-year gap between the reform being proposed and completely imposed [3]. Thus, all reforms take time, and might not be updated with the rapid change in the society.

Secondly, reform is itself a very hard and complicated process. Every reform should have a core objective that the government wants to achieve. The more specific the goal is, the more likely the reform might be successful. The basic unit of students is schools, which are the places where students attain knowledge. If any reforms happen, it is passed down through schools to have an impact on students. However, every single school is different in all perspectives, from location to the facilities to the teachers. Thus, planning a reform that specifically fits every individual school is impossible. As a result, guiding through the major educational reforms in the past, their goals are broad and similar: rebuilding textbooks, increasing students' engagement developing a well-rounded person, etc. Specific goals are rare. Thus, efficient progress is hard to make.

2.2.3. Educators' Perceivability and Worries

When reforms are implemented, teachers are key to the success of it. They are the ones who absorb the content changes and pass them down to students. However, when teachers are informed to change the contents or the way they have been constructing classes for decades, they might naturally resist these changes. Furthermore, teachers' focus is the experimentation of teaching, instead of the development of the educational systems. Thus, sometimes how they perceive the goals might differ from what the government expects. Case studies show that teachers are indeed, often concerned and struggled when major educational reforms happen regarding a change in their teaching method or contents. This results in the fact that the effects of reforms might not be as good as what the government has expected.

In a case study about Hong Kong implementing project-based learning in schools, different teachers coming from different schools all show different levels and kinds of concerns regarding a change in their teaching style and method. Project Learning is when teachers do not just talk for the whole time, but instead incorporate ideas about how to learn by acquiring and constructing knowledge and developing various important generic skills through a variety of learning experiences. Concerns came from all aspects, including concerning their career development, doubting whether there would be a positive effect on students, etc. [4].

In a separate study done on a science class project reform, teachers' experience can sometimes conflict with the reforms' contents, and dissonance can occur in between. In this reform, group work in classes is highly encouraged because it develops students' communication skills by providing opportunities for students to share their ideas and learn from each other. However, some teachers are not used to constructing classes in this format. Conventionally, they preferred letting students work individually on their own. Teachers claim that during group work, the good students are covering all the work for the bad ones, thus not helping the bad students to improve. Thus, dissonance and conflicts occur between the science teachers' teaching philosophy and the method of the new science curriculum [5]. This makes teachers hesitant to adopt the new methods of teaching, creating obstacles to the success of reforms. Changes are hard, and teachers might struggle frequently to adapt to the new methods of teaching.

2.3. Impact of Hysteresis on Education

After analyzing the causes and origins of the problem, the following part will discuss the impacts of hysteresis on education. The main reason that hysteresis is categorized as negatively impactful is because it causes education to lose its two main original purposes.

2.3.1. The Disconnection between Class Contents and Societal Needs

As discussed in the 'purpose of education' section, education is meant to help students adapt to the future by providing valuable experiences and concepts. However, the hysteresis of education turns that around. Education focuses on the current society and summarizing the past. Thus, how to apply this information to a future setting remains highly questionable due to vast changes in the social background. This disconnection would result in unemployment, as the skills and knowledge people acquire in schools diverge from the companies' mainstream demand for skills. This makes graduates spend extra time and effort to learn basic skills. Education, in this way, might be less helpful as a tool to help learners in the future. An example is the English course in China back in the 1970s and 80s. The course is designed to help students be able to read introductory English words and write plain and simple sentences. It is designed in this way because there were not a lot of opportunities back then to speak English, and the connection between China and the rest of the world was less common. However, when students at that age grew up and became adults in the 90s and 00s, the demand for English rose dramatically due to China's rapid growth and development. Many job opportunities would require advanced English language skills, which most students at that time didn't have. Thus, the societal demand for English made college graduates who are finding jobs not adapted to it. This example indicates the fact that disconnections between class contents and societal needs can affect future employment paths.

2.3.2. Rich Poor Gaps Maintains

The core of education is about equality. However, due to the hysteresis of education, educational inequality increases. When knowledge in schools that everyone receives equality gradually diverges from real-life applications, the importance of in-school education will follow to decrease. People can no longer rely on school education to adapt to their subsequent careers. Consequently, it reaches a point where the importance of outside-of-school work exceeds the mandatory school courses. Outside-of-school work requires large economic investments, and it is certainly something that most normal families cannot afford. This narrows the chances for the students who purely rely on the contents taught in school to find a satisfying job. Without a satisfactory job, there is no chance that students coming from lower classes can earn a decent salary to narrow the rich and poor gaps. In other words, the importance of family background and economic condition will be highlighted while decreasing the importance of in-school performance, generating an unequal situation for middle-class or rural area students.

3. Individual Differences

A key component in education that this paper has yet not talked about is students. Due to rapid development, society changes quickly through the years; correspondingly, changes in students from time to time are also obvious through different aspects. The core of all changes in different aspects is the environment students grow in. In this essay, environment of growth refers to the social background of the place students are raised, and what they see and hear during youth. This will affect how students think, behave, and act.

First, students' growing environment corresponds with their demands. Children will always demonstrate a strong ease towards objects that they don't have or things that will significantly improve their living. Thus, the current living standard that students are in plays a significant role. If the general social background is chaotic and with frequent wars, students' demand for sufficient food, water, and a safe shelter would come first than any other objects. When the basic living standard is reached and attained, the demand would shift towards bringing a better quality of life. Education is a key to that. As the economy develops, people's demand for education increases over time: the number of high school graduates has been consistently increasing since the 1980s, parallel to China's economic development trends [6].

Furthermore, the thinking and mindsets of students are also changing, and it also corresponds with the big social context. How students value education has changed significantly over the past decades. In the past, education has been considered less important than seeking jobs at the age of high school. Elder generations that experience poverty value money as the top priority. At the age of middle school, they would start working to earn money and help their parents to decrease the whole family's economic burdens. Sitting in classrooms learning new knowledge does not earn any money. However, in modern China, students on average value education much more importantly than before, putting its priority in front of early work. Nowadays students value education as an inevitable and fundamental tool for later success. Moreover, they see it as an approach to broaden their horizons and perspectives.

4. Optimal Path for Educational Development and Reforms

Incorporating the problem of educational hysteresis with the individual differences through time, this section provides an optimal path regarding these problems.

For governments, constantly updating the educational system, and adding the latest findings and events into it is necessary to solve the problem of hysteresis. Also, students are the group receiving education. Thus, when students are changing from time to time, the whole education system should be altered to best fit the newest students' characteristics. Apart from that, breaking bigger goals in reforms into smaller ones, achieving them step by step and based on the conditions of local schools to give different and specific reform contents towards different schools would certainly improve the effectiveness of the reforms significantly.

For teachers, changes are always hard and time-consuming, but they are necessary in providing an updated and effective education system. It is important to keep updating and improving their teaching methods and class structures based on both their own experiences and social developments. Textbooks are certainly guidelines for teaching, but teachers should not only use textbooks all the time. Instead, incorporating the latest educational methods and tools, along with additional updated information, would certainly help students learn more and adapt better later in society. Apart from academic support, teachers should also focus on students' mentality. Throughout a teacher's career, different students that the teacher encounters will differ a lot in their attitudes toward learning. Thus, teachers should always make minor adjustments in teaching based on students' circumstances.

5. Conclusion

Based on the status quo, problems of educational hysteresis occur in the education systems around the world due to timeline delay and difficulties in reforms, and it is expressed through undermining the original purposes of education--investment towards the future and closing rich-poor gaps. Through rapid societal developments, students change corresponding in all aspects. Thus, a constant change in the government's education system is necessary. Apart from that, teachers should also follow the changes, keeping track of the student's psychological conditions.

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