Assessing Student Learning of Systems Thinking Concepts in an Online Learning Module
(Technical Report)

How Socio-Cultural Factors Affect the Wellbeing of India
(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Sciences
University of Virginia • Charlottesville, Virginia

In Fulfillment of the Requirements for the Degree
Bachelor of Science in Systems Engineering

By

Rahi Desai
May 07, 2020

Table of Contents

SocioTechnical Synthesis

Wellbeing is defined as an individual's or a group's health, happiness and fortune. Many different measures of wellbeing have developed over the years, one of the most prominent being Gross Domestic Product (GDP). GDP measures the economic welfare of a nation and while it doesn't necessarily concern itself with the health, happiness and fortune of a nation, it has established itself as a point of comparison to measure how well-off certain countries are to one another. However, what other factors should be considered, and what is the significant of having a cohesive measure of wellbeing?

According to the book <u>Beyond GDP</u> written by Jean-Paul Fitoussi, Joseph Stiglitz and Martine Durand, wellbeing indicators outside of economic welfare should include: work life balance, health status, education and skills, social connections, civic engagement and governance, environmental equality, personal security, subjective wellbeing, income and wealth, jobs and earnings, and housing. As a result, several other measures of GDP like the Index of Social Health, Social Progress Index, Human Development Index, etc. have been developed over the years. However, none of them consider the cultural factors that may impacts the wellbeing of a nation. Cultural values and norms greatly define what wellbeing means in different nations. I will use the framework of sociocultural factors to discover the cultural factors that affect the wellbeing specifically of the people of India. I chose India as a case study, because it is a nation with an incredible wealth of culture, having over 26 languages and 100s of dialects which lend itself to the development of various subcultures. Despite the existence of these sub-cultures, there are some pan-Indian cultural values and norms that have been established since the Vedic Age. I hope to use surveys and interviews of Indian Americans, international Indian students at UVA, family and friends and India to see how these pan-Indian cultural values affect

their wellbeing. I expect to find that existence of such a defined and unified culture positively impacts the wellbeing of Indians. The implications of this research are that, wellbeing is quite subjective, as different nations prioritize different values. Economic wellbeing is an important factor to define wellbeing, but other factors must also be considered, including that of cultural values.

The importance of having a metric to measure wellbeing comes down to the concept of systems thinking. Systems thinking provides people with a holistic approach to solve problems and a methodology to use data as a guide to solve these problems. Especially in our increasingly data-driven world, it is important for people to understand this skill as an approach to solving problems in their everyday lives. Thus, my technical project aims to disseminate knowledge about systems thinking specifically to college students, via an online module. Groups of students in the College of Arts and Sciences(CLAS) and the School of Engineering and Applied Sciences(SEAS) at the University of Virginia are asked to complete a pre-test, an online module, and a post test. Differences in scores among the pre and post tests are used to analyze how effectively knowledge of systems thinking is disseminated through the online module, and whether the academic background of an individuals plays a role in how successfully he or she is able to grasp the concepts on systems thinking. The goals of this module are firstly to spread the knowledge of systems thinking to college students and secondly to assess the effectiveness of online modules in today's world. With an increasing reliance on technology, especially in the wake of COVID-19, this can serve as part of a large body of literature regarding the advantages and disadvantages of technology based learning.