SYSTEM DYNAMIC MODELLING TO STUDY IMPACT OF STUDENT ATTENDANCE QUALITY ENHANCEMENT IN TECHNICAL EDUCATION

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Abstract

The Primary Focus of Technical Education is to cast skilled technical manpower in nation. Majority of technical graduates produced in India comes from private Institutions but due poor quality of these graduates the employability rate is low. In the present Research findings an attempt has been made to study the impact of student attendance on quality of technical education system by developing System dynamics model.

INTRODUCTION

Engineering graduates have a key and long haul affect on profitability development in industry and administration divisions. To deliver advanced mechanical items and administrations that are aggressive in the worldwide market and to understand the 'Make in India' activity, India will require a truly high number of all around prepared and amazingly qualified building graduates.

Is India prepared for it? Lamentably the actualities look somewhat inauspicious. Of the current 3700 open and private building foundations that have more than 4 million designing understudies, just a chosen few are delivering brilliant graduates.

Organizations like the IITs, NITs and a couple of other open and private specialized colleges are as a matter of fact performing admirably. The issue is that these establishments deliver under 5-10 for each penny of the architects in India. Most different organizations are in genuine need of change in their quality. A greater part of these are associated to colleges and educate the educational modules created by the affiliating college. Thus, they do not have the motivating force to persistently enhance the nature of educating and learning and are not equipped to adjust to the changing capability needs of the employment showcase. These schools for the most part concentrate on undergrad educating and their post-graduate projects are regularly powerless. Besides, they do not have a methodical limit building exertion in training and research. The quality affirmation and accreditation endeavors of these establishments can be described by "consistence" as opposed to "change" apparatus. The vast majority of them don't have a profound engagement with the businesses and are once in a while associated with provincial advancement and organizations with neighborhood monetary players. Without solid connections in the business, the schools have a shortage of entrepreneurial and advancement soul. What's more, thus, the understudies and the staff get little presentation and have next to zero experience with regards to taking care of reasonable issues. The major goal of Technical education is to develop technical skills among the youth for creating technical man power in country. India produces large number of engineers annually. As per review report of All India council of technical education

2015 the total enrollment for engineering education is around 12 lakhs. In spite of having such a huge capacity of awarding technical education country is facing poor employability rate due to poor quality of engineers produced as per international bench mark Dewanga (2013). This is one of the major drawbacks for technical education of India and there is imperative need to review the existing policy and to redefine them and to test policy that can upgrade the existing quality Kurt (2003).

LITERATURE REVIEW

Number of research scholars has examined the effect of each individual item constituting the overall studying impression such as library, canteen, personnel, Infrastructure development etc and consequently their effect on students satisfaction. Jayassundra(2010) have worked in the area of library science and its affect on student satisfaction. Parasuraman (1998) has proposed model for measuring service quality and its affect on student satisfaction. Alves (2013) has found the influence of faculty reputation and budget on student satisfaction. Exclusively reviewing contributions made by system dynamics community in the field quality of technical education there are some well known findings such as Kennedy (1998) elaborates model which incorporates factors such as planning, resources and human resource management. Vahdatzad, (2000) has proposed about the combined task of government and University for expansion of planned quality education. Kennedy (1999) reveals on the role of fund management for quality education. Barlas (1996) Discusses the importance of facilities, infrastructure and projects for quality education. Mohamed (1999) emphasizes on the importance of faculty in quality education. Hermann (1996) overviewed role of academic planning for quality education. Badri (2010) in their paper proposed students index model.

The Relevance of System Dynamics System dynamics as a Methodology

System dynamics (SD) is a computer-aided approach for analysing and solving complex problems through policy design and analysis. The problems addressed by SD are based on the premise that the structure of a system, that is, the way essential system components are connected, generates its behaviour (Luna-Reyes and Anderson, 2003). These problems have at least two features in common. First, they are dynamic (involve quantities which change over time). Secondly they involve the notion of feedback where, item x affects another item y and y in turn affects x perhaps through a chain of causes and effects (Forrester, 1998). Forrester further suggests that studying a link between x and y, independent of the other links between y and x cannot predict how the system will behave; only the study of the whole system as a feedback system can lead to correct results. Specific to HE issues is Kennedy's (2002) taxonomy for system dynamics models that include topics such as: external forces, corporate governance, planning, resources and budgeting, human resource management, teaching quality, teaching practice, micro worlds, and enrolment demand. Apart from this taxonomy, recent studies acknowledge complex interactions in modelling higher education issues, but use methods that don't capture nonlinearity and feedbacks in their inquiry. For instance, Try and Grøgaard (2003) measured the relationship between resources and outcomes in higher education in Norway

using hierarchical linear modelling (HLM) but restricted institutional resources to student composition, financial and staff resources, and staff priorities. Ho et al. (2006) suggest three groups of resources: manpower (human resources), hardware (infrastructure type), and software (intangible effects e.g., conference facilitation) that can be prioritised and budgeted for using analytic hierarchy process concurrently with goal programming approach. Although Ho and colleagues incorporate a large section of resources, their approach is linear and therefore sacrificing non-linear dependency. For example, computing resources facilitate teaching, learning and research which in turn affect perceived quality of graduates. By using data warehousing approach, Vinnik and Scholl (2005) explore the relationship between university's educational capacity and resource management but they do not suggest quality implications. This paper adopts the SD approach to investigate the dynamics of student attendance on Quality of Technical education.

The Importance of SD in this investigation is in its capability to:

• Model feedbacks or interactive views in dynamic systems like higher education.

• Incorporate non-linear relationships inherent in higher educational quality issues.

• Address complexity situations while experimenting their behavior over time.

• Accommodate soft factors such as Academic Excellence, Placement of Students.

Causal loop Diagram

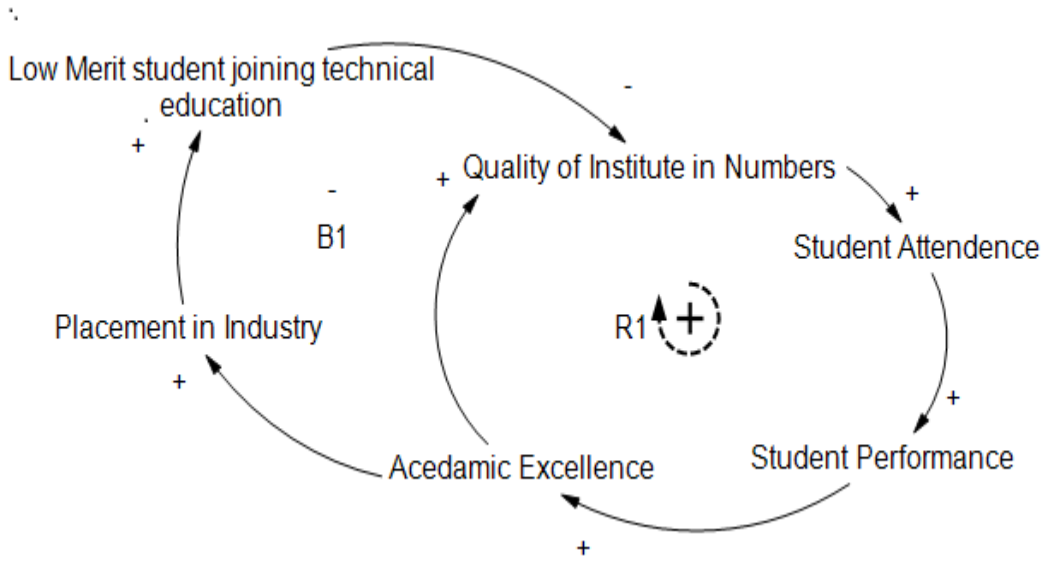


Figure. 1. Cuasal Loop Diagram

The causal loop diagram shown in above figure.1.show that as quality of Institute in numbers increases as student attendance increases this increase also results in increase in student performance which increases academic excellence which increases quality of technical education in numbers again this loop is reinforcing loop R1.The balancing loop B1 depicts as academic excellence increases placement in Industry of students increases this results in low merit people joining the technical education which ultimately decreases the quality of technical education in numbers.

Stock and Flow Diagram

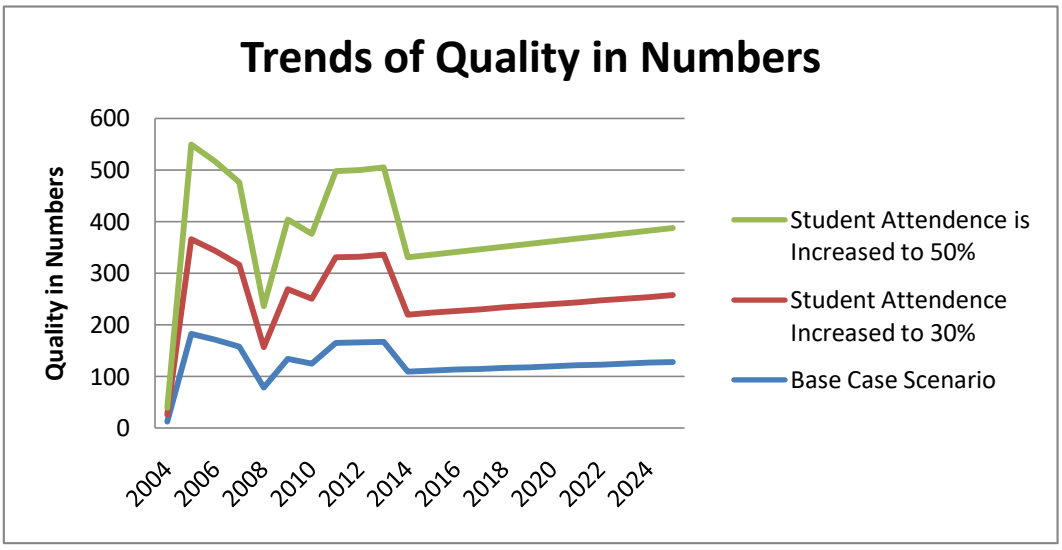
Based on the above causal loop the stock and flow diagram is generated which is system dynamic model which is simulated for 10 years and results are obtained by testing the impact of student attendance on quality of technical education.

Results

TABLE 1.WHAT-IF SCENARIO STUDENT SATISFACTION

YEAR	Quality of technical education in Numbers		
	Student Attendance base case	**Student Attendance Increased to 30%**	**Student Attendance Increased to 50%**
2004	12.10	13.25	13.45
2005	182.36	183.51	183.71
2006	170.98	172.13	172.33
2007	157.78	158.93	159.13
2008	77.63	78.79	78.99
2009	133.73	134.88	135.08
2010	124.32	125.47	125.67
2011	164.78	165.93	166.13
2012	165.49	166.64	166.84
2013	167.28	168.44	168.64
2014	109.31	110.46	110.66

YEAR	Quality of technical education in Numbers		
	Student Attendance base case	**Student Attendance Increased to 30%**	**Student Attendance Increased to 50%**
2004	12.10	13.25	13.45
2015	111.01	112.17	112.37
2016	112.71	113.87	114.07
2017	114.42	115.57	115.77
2018	116.12	117.27	117.47
2019	117.82	118.97	119.17
2020	119.52	120.67	120.87
2021	121.22	122.37	122.57
2022	122.92	124.07	124.27
2023	124.62	125.77	125.97
2024	126.32	127.47	127.67
2025	128.02	129.17	129.37



Conclusion

From the above discussion it is concluded that as student attendance is increased the students performance is enhanced which results in enhancement of quality of Technical education in numbers.

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