



POLICY PLANNING FOR QUALITY SUSTAINABILITY IN HIGHER TECHNICAL EDUCATION

Sanjay Soni¹, Dr.V.K.Nema², Dr.B.K.Chorasia³

Abstract- The main focus of technical education is to develop technical manpower in country. In the present scenario large number of Technical graduates comes from Institutions managed by private organizations. Due to lack of sound technical skills know how and poor quality of these graduates the employability rate is low. In the current findings an effort has been casted to study the role of student attendance on quality of technical education system by constructing causal loop diagram of technical education system that is clearly understanding how student attendance is connected to other parameters of technical education system such as performance of students in exams, placements of students through campus selection etc. By taking the base of causal loop diagram system dynamic model is constructed for studying effect of student attendance on quality of technical education for developing sustainable quality.

1. 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.

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).

2. 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,

¹ Research Scholar, Industrial Engineering and Management. Mewar University Chittorgarh.

² Professor, Mewar University Chittorgarh

³ Professor Jabalpur Engineering College, India

(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.

3. THE SIGNIFICANCE OF SYSTEM DYNAMICS AS A METHODOLOGY

System dynamics (SD) is a PC supported approach for breaking complex problems through plan and Investigation. The issues tended by SD depend on the premise that the structure of a system, that is, the way essential system components are associated, progresses its behavior (Luna-Reyes and Anderson, 2003). These problems highlights at least two features in like manner. To start with they are dynamic (involve quantities which change over time).

Furthermore 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 Significance of SD in this examination is in its ability to:

- Demonstrate inputs or intelligent perspectives in unique frameworks like advanced education.
- Join non straight connections characteristic in higher instructive quality issues.
- Address many sided quality circumstances while testing their conduct after some time.
- Oblige delicate factors, for example, Scholastic Magnificence, Position of Understudies.

3.1 Causal loop Diagram

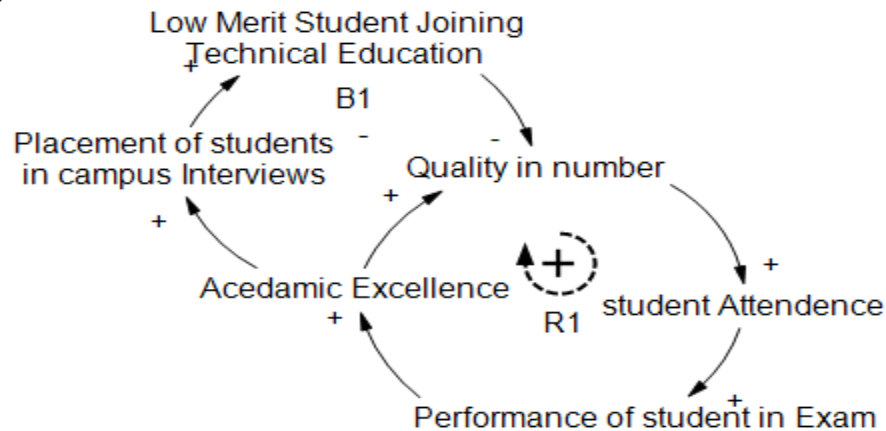


Figure 1. Causal Loop Diagram

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 student performance which results in 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.

3.2 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.

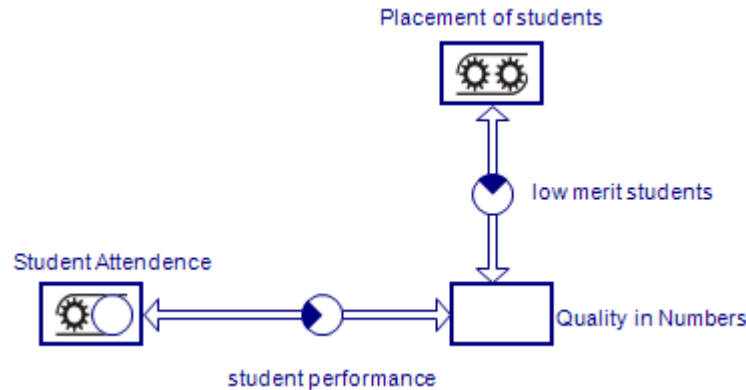


Figure 2. Stock and Flow Diagram

4. RESULTS

Table 1. What-if Scenario Infrastructure GROWTH

YEAR	Quality of technical education in Numbers		
	Student Attendance Growth 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
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

5. CONCLUSION

The present research work has aimed with the problem of finding the impact of student attendance on quality of technical education system by keeping in mind the real system, We find that a wide range of factors makes it complex to find their interrelatedness and their behavior, Therefore it is difficult to predict the quality of technical education system with the available wide range of measures. In the present research an attempt has been made to combine various factors that are important in quality of technical education system and to study their dynamic behavior under system dynamic modeling framework and a system dynamic simulation model has been developed to support policy planner. Following conclusions can be drawn from the scenario generated from the Simulation run of the model:

Real trends for the quality in numbers for an institute are obtained if the data is incorporated in the modeling framework. The results show the increase and decrease in quality with variation of student attendance defined empirically for quality computations.

As student attendance is enhanced the learning ability of the student is increased and academic excellence is increased that increases the confidence of student this is real behavior of the system the result obtained from the model show the similar

behavior this conclude that model is capturing real behavior of the system and can be used for testing policy related to quality of technical education.

From the above results depicted we can conclude that if student attendance in the institute is enhanced quality of technical education can be suitably increased.

6. REFERENCES

- [1] Alves ,H (2013) 'Student Satisfaction Index in Portuguese public Higher Education', The Service Industries Journal,pp.795-797.
- [2] Badri, M.(2010) A modified customer Satisfaction index model for the education sector in Abu Dhabi International Journal of Business and Public Administration, Volume 7, Number 1,pp.148-159.
- [3] Barlas,Y (1996) 'Decision support for strategic university management', In proceedings of 14th system Dynamic conference.
- [4] Barnabe, F (2004) 'From Ivory Towers to Learning Organizations the role of System Dynamics in the Managerialization of Academic Institutions' In Proceedings of 22nd System Dynamic International Conference pp.40-59, Oxford, England.
- [5] Bass, F (1969) 'A new product growth model for consumer durables', Management Science, Vol. XV, No.Y5, pp.215-227.
- [6] Dewanga, A (2013) 'Challenges before Engineering Education in India', Journal of Art, Science and Commerce, Vol. II, No. Y2S.
- [7] Hermann, J.F (1996) 'A Flight Simulator for University Department Planning', In Proceedings of 14 th System Dynamic Conference.
- [8] Jayasundra, C (2010) 'Using focus groups to investigate service quality determinants for Customer Satisfaction in selected university libraries in Sri Lanka', SAjournal of Information science, pp.118-126.
- [9] Kennedy, M (1998) 'A Pilot System Dynamics Model to Capture and Monitor Quality Issues in Higher Education Institutions Experiences Gained', In Proceedings of 16 th System Dynamic Conference, Quebec City,Canada, pp.0-5.
- [10] Kennedy, M.; Clare, C (1999) 'Some Issues in Building System Dynamics Model for Improving the Resource Management Process in Higher Education', In Proceedings of the 17 th System Dynamic Conference, Wellington,City,New Zealand.
- [11] Kurt Seemann (2003) 'Basic Principles in Holistic Technology Education', Journal of Technology Education, Vol.XIV, No. Y2.
- [12] Mohamed, M.; Clare, C (1999) 'Microworld of an Open University', In Proceedings of the 17 th System Dynamic Conference, Wellington,City,New Zealand
- [13] Oya, B.; Williams, D.;Barendsen, E(2008) 'A System dynamics tool for higher education funding and quality policy analysis', In Proceedings of the 24th System Dynamic Conference.
- [14] Parasuraman, A (1998) 'Servqual: A multiple- itemscale for measuring consumer perceptions of Service quality', Journal of Retailing, Vol.LXIV, No.Y1,pp.12-40.
- [15] Vahdatzad, M.A.; Mojtahedzadeh, M.T (2000) 'Some issues in the strategic management in a fast Growing academic Institution: The case of University of Yazad In Proceedings of the 18th System Dynamic Conference, pp.6-10.