Library Progress International
Vol.44, No.4, Jul-Dec 2024: P. 255-271

Print version ISSN 0970 1052
Online version ISSN 2320 317X

Original Article

Available online at www.bpasjournals.com

Efficiency and Effectiveness Dynamics of Higher Education Institutions in India – A Theoretical Analysis

Ila Garg[1], Dr. Sabyasachi S. Roy[2]

[1]Research Scholar, Management Department, Chanakya National Law University, Patna-India.
[2]Assistant Professor (Track), Indian Railways Institute of Civil Engineering (IRICEN), Pune-India.

How to cite this article: Ila Garg, Dr. Sabyasachi S. Roy(2024). Efficiency and Effectiveness Dynamics of Higher Education Institutions in India – A Theoretical Analysis. Library Progress International, 44(4), 255-271

ABSTRACT
Educational institutions are crucial in shaping disciplined citizens who contribute to societal well-being, economic development, and sustainable livelihoods, which are essential for a thriving economy. Higher education not only focuses on academic learning but also significantly contributes to innovation, societal growth, and cultural development, helping India aspire to become a global knowledge superpower. This paper presents a theoretical analysis of the efficiency and effectiveness dynamics of Higher Education Institutions (HEIs) in India, emphasising their critical role in societal and economic development. The study explores the definitions and distinctions between efficiency-focused on resource utilisation and effectiveness, which pertains to achieving institutional goals. Through a comprehensive literature review, the research identifies key variables influencing the performance of HEIs, including organisational structure, leadership, and stakeholder engagement. The Pounder Model is employed to analyse effectiveness, highlighting the importance of goal-setting and management priorities in educational settings. The methodology involves an analytical examination of existing texts, including articles and reports, to derive insights into the operational dynamics of HEIs. The findings underscore the necessity for HEIs to balance efficiency and effectiveness to ensure long-term sustainability and growth. By addressing the unique challenges faced by diverse educational institutions, this study contributes to the understanding of performance metrics in the higher education sector in India, ultimately aiming to enhance the quality of education and its impact on society.
KEYWORDS: Higher Education Institution, Efficiency, Effectiveness, Data Envelopment Analysis, Pounder Model

Introduction

A nation's development is directly proportional to well-developed intellectual citizens. The educational institutions play the vital role in creating disciplined citizens. Societal well-being, economic development, higher standard of living and sustainable livelihood are the foundation of a well-developed economy and the objective of every developing economy. Educational institutions play a significant role in creating the right human resources for taking development ahead[1]**.** It works with the future workforce of an economy and trains them with the right skills and the conceptual foundation to drive the economy ahead[2]**.** Educational institutions are the building blocks of every growing economy. It encompasses the world of higher education, research, and scholarly activities. It is a realm where knowledge is cultivated, disseminated, and advanced through rigorous academic endeavours.

At its core, the education sector involves the collective effort to explore, understand, and expand the knowledge across various disciplines. It is a hub for learning, critical thinking, and intellectual engagement for the country's future workforce. It ultimately helps a developing country like India transform into a vibrant society and achieve its mission as

[1] Education Policy 2020 Available at, https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf last visited on 1/07/2023
[2] E. A. Hanushek, "Will More Higher Education Improve Economic Growth" *Oxford Review of Economic Policy* 32/4: 538–52 (2016).

a global knowledge superpower[3]. Beyond education, higher education contributes significantly to society by fostering innovation, societal growth, and cultural development[4]. In broad terms, higher education should not be restricted to fixed standards or 'conformity to Standards only' as highlighted by [5]Van Ginkel and Dias rather, it should be the foundation for the advancement of society through education and research, intellectual growth, and the quest for knowledge.

Ecosystem plays an essential role in educating and nurturing leaders of institutions, entrepreneurial organization's growth, medical discoveries, social improvements, the design of policies, and the comprehension of various phenomena. Universities in India play a significant role nationally and globally, as substantial contributors to research and intellectual development [6]**.** India's academic landscape is known for its remarkable diversity and scale. The country is home to a wide range of universities, colleges, research institutes, and specialized institutions that cater to various fields of study. These include renowned institutions such as the Indian Institute of Technology (IITs), Indian Institute of Management (IIMs), Indian Institute of Science Education and Research (IISERs), Indian Institute of Science (IISc) and prestigious universities spread across different states. It encompasses a diverse array of disciplines, institutions, and educational approaches that reflect the country's cultural and intellectual heritage**.** Academia is a dynamic field, and efforts are continuously being made to strengthen the education system and research capabilities. The Indian government has launched initiatives to promote research and innovation, enhance the quality of education, and establish research collaborations with international institutions. These efforts aim to elevate the status of academia in India on the global stage.

1.1 Higher Education Institution

Higher Education Institutions result from the needs presented by business, economy, and society over time[7]**.** They are recognized as one of the critical elements or as models of economic development and growth. As the growth embraces the nation, knowledge and information become the key factors of productivity and competition, giving impetus to higher education institutions as the growth model[8]**.** India is a unique case given its diversity, population and economy. A nation with such wide diversity and the role of higher education institutions in meeting the demands of society, one needs to evaluate the post-secondary education system in the thread of its social ecology[9]**.**

The higher education system in India comprises of Central Universities, State Universities, Private universities, Deemed universities and Institutes of National importance[10]**.** These institutions can further be classified based on their source of establishment. Institutions are classified as Central universities if they are established by an Act of Parliament, similarly it is classified as State university if is of a State Legislature. The Deemed Universities include those institutions, which have been authorized to award their own degrees through central government notification and thus have the status of a university, where as there are some institutions that are awarded a special tag as prestigious institutions by the Parliament and are titled as Institutes of National Importance and Institutions established by State Legislative Act and colleges affiliated with the University including both government-on aided and unaided.

A Higher Education Institution (HEI) refers to an organization or establishment that provides post-secondary education beyond the level of secondary schooling[11]. These institutions offer a wide range of academic programs, courses, and

[3] Education Policy 2020 Available at, https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf last visited on 1/07/2023

[4]H. L. Smith, "Universities, Innovation, and Territorial Development: A Review of the Evidence", *Environment and Planning C: Government and Policy* 25/1: 98–114 (2007).

[5] H. van Ginkel and M.A.R. Dias, "Institutional and political challenges for accreditation at the international level", In [1] pp 37-57(2007).

[6]D.C.Mowery, "The Bayh-Dole Act and High-Technology Entrepreneurship in U.S. Universities: Chicken, Egg, or Something Else?" Paper Presented at *Entrepreneurship Education and Technology Transfer, University of Arizona* (2005).

[7]I. M. Pandey, "Governance of Higher Education Institutions*" Vikalpa: The Journal for Decision Makers* 29(2), 79–84 (2004).

[8] Groezinger, Gerd and Rodríguez-Gómez, Roberto, "Managing Higher Education: Introduction, management revue" *Socio-economic Studies* 18 (2) 95-101 (2007)

[9] W. G. Tierney, & N. S. Sabharwal, "Reimagining Indian Higher Education: A Social Ecology of Higher-Education Institutions" *Teachers College Record: The Voice of Scholarship in Education* 120(5)1–32. (2018).

[10] India Higher Education available at https://studyinindia.gov.in/about-indian-higher-education- as viewed on 1/7/2023.

[11] Government of India, Ministry of Education- Annexure 3, available at https://www.education.gov.in/sites/upload_files/mhrd/files/ebook-2011_12/annexures/Annexure-3.pdf as viewed on 1/7/2023

degrees to students pursuing advanced education and specialized knowledge in various fields[12]**.** The primary focus of higher education institutions is to provide a comprehensive learning environment for students to develop advanced knowledge, critical thinking skills, and professional competencies in their chosen fields. HEIs offer undergraduate programs for bachelor's degrees, postgraduate programs leading to master's degrees or doctoral degrees, and sometimes professional or vocational programs. Higher education institutions typically have a faculty composed of professors and lecturers who are experts in their respective disciplines[13]**.** They teach, mentor, and guide students through their academic journey. HEIs also emphasize research and scholarly activities, where faculty members engage in original research, publish academic papers, and contribute to the advancement of knowledge in their fields. In addition to teaching and research, higher education institutions often provide support services such as libraries, laboratories, student counselling, career guidance, extracurricular activities, and student organizations. These services aim to create a holistic learning experience and promote the overall development of students.

Higher education institutions play a crucial role in society by preparing individuals for professional careers, fostering intellectual growth, promoting critical thinking, and generating new knowledge. They contribute to the advancement of various disciplines, innovation, societal development, and cultural enrichment. HEIs also serve as hubs for collaboration, networking, and fostering intellectual and cultural diversity.

1.2 Efficiency Measure for HEI

Efficiency is no longer a matter of choice for a higher education institution rather it has become a necessity component. Measuring efficiency for an education institution is a difficult task for two main reasons. First challenge is assigning monetary values to a non-profit organisation and secondly because of its nature of multiple inputs and outputs.[14] Efficiency for a higher education institution can be looked from various perspective. The first step would be to identify the specific decision-making unit. It could be a department or a process or an activity as educational institutions have multiple processes as well as multiplicity of inputs and outputs. Once the decision-making units are identified, then the second step is to classify its inputs and outputs. These form the basic components for efficiency assessment for a higher education institution. The concept of efficiency can be traced back to the year 1957 when Farrell[15] first introduced the concept and even classified it for simplicity of understanding. Farrell classified efficiency in three categories, the technical efficiency, the allocative efficiency and the economic efficiency. The application of the studies of efficient is not restricted to one or two sectors or areas. It has been observed by various researches that efficiency is applied in varied field, right from environmental sciences, management, economics to health care, computer sciences, transportation and many more.[16] One of the key reasons for increased importance on study of efficient is to the utilization of the limited resources to its best. This will ensure that we produce the maximum output with the minimum input, thereby enhancing our processing capabilities and also reducing the wastages. The study of efficiency helps the organizations in multiple ways. It acts as an effective measure for performance comparison of homogenous units, identifying the sources of difference and also suggest the best measures to be adopted uniformly.[17] Efficiency studies with reference to Higher Education Institutions are in rise due to its benefits. Higher Education is one of the critical sectors supporting the economic development by provided the skilled human resources. The application of efficiency study in the higher education requires careful consideration of the

[12] All India Survey on Higher education – Annexure, available at https://www.education.gov.in/sites/upload_files/mhrd/files/ebook/ebook_files/annexures/Annexure-2.pdf as viewed on 1/7/2023

[13] All India Survey on Higer education – Annexure, available at https://www.education.gov.in/sites/upload_files/mhrd/files/ebook/ebook_files/annexures/Annexure-2.pdf as viewed on 1/7/2023

[14] C.T. Kuah, K.Y. Wong, "Efficiency assessment of universities through data envelopment Analysis" Procedia Computer Science 3 (2011) 499–50

[15] M. J. Farrell, "The measurement of productive efficiency. Journal of the Royal Statistical Society: Series A" *(General)* 120(3) 253-281 (1957).

[16] J. Gerami, "An interactive procedure to improve estimate of value efficiency in DEA" *Expert Systems with Applications* 137 29-45 (2019). https://doi.org/10.1016/j.eswa.2019.06.061

[17] K. P. Kalirajan, & R. T. Shand, "Frontier production functions and technical efficiency measures" *Journal of Economic surveys* 13(2) 149-172 (1999).

factors because of its unique features. Higher education segment comprises of multiple stakeholders, objectives, inputs and outputs. Many a time it is observed that it spreads its wings beyond its basic activities of teaching and research.[18]

Research Gap

The overall challenges and opportunities in effectiveness of HEI has mostly been overlooked in studies as majority of the studies focus exclusively on the role of Academic Staff in quality delivery and output.

Objectives

The specific objectives of the study are:

i. To explore the fundamental characteristics that differentiate efficiency from effectiveness of an organisation
ii. To explore various models used to measure efficiency of HEI
iii. To identify various factors affecting efficiency of HEI.
iv. To explore the effectiveness model used to study the effectiveness of HEI.

Review of Literature

For any organization to sustain constant growth in long term, requires the organization to be efficient and effective in delivering result to its stakeholders. Higher education institutions are no different. Irrespective of the category they are in, it's the Efficiency and effectiveness that will determine its existence and growth in the long run. The term 'Efficiency' is connected to the input and output concept, whereas 'effectiveness' relates to its overall impact. In other words, effectiveness is about achieving goals, while Efficiency is about using resources effectively to achieve those goals[19] . Societal concern assumes great significance as governance in HEIs cannot be devoid of environmental and social responsibility. All organization's actions influence the members of society, directly or indirectly. Therefore, HEIs should strive to balance their stakeholders' needs, society's demands, and autonomy[20]. Extensive data is available in the context of the performance, management and its effectiveness in servicing the stakeholders and society at large for researchers to review and identify the parameters of Efficiency and effectiveness[21]. With each institution having its own story of limited budget and the relative higher outcome, Efficiency has drawn a lot of attention[22]**.** Though multiple methods and approaches are applied to devise models, one approach that remains common among all is input-process- output theory of measuring Efficiency in higher education institutions. Authors have even specified in exact terms what to be included in each of these variables i.e., inputs (human and financial resources, facilities) to 'produce' important outputs such as education (graduates), research (publications) and knowledge transfer (patents, spin-offs, public events, etc. [23]. Efficiency is directly connected to the productivity of the manpower engaged in various activities of the institutions. The role, functions, and dimensions of measuring variables differ greatly between the academic and non-academic Staff of an educational institution. However, one thing that remains common is the clarity of objectives and priorities, the creation and communication of attractive incentives, and the timely production of data to help search for efficient substitutes[24]. The research also suggests adopting an experimental approach to highlight that the institution values creativity and risk taking.

Among all the data reviewed, the first clarity that needs to be developed is that all the higher education institutions are traditionally treated as homogenous groups, but in reality, they are not. The best way to highlight the heterogeneity of higher education institutions is by assessing the input–process and output variables and quality. They differ vastly

[18] A. Dixit, "Incentives and organizations in the public sector: An interpretative review" *Journal of Human Resources* 37(4) 696-727 (2002). https://doi.org/10.2307/3069614

[19] A. W. Lindsay, "Institutional Performance in Higher Education: The Efficiency Dimension" *Review of Educational Research* 52(2), 175–199 (1982).

[20] I. M. Pandey, "Governance of Higher Education Institutions*" Vikalpa: The Journal for Decision Makers* 29(2), 79–84 (2004).

[21] De Witte, Kristof & López-Torres, Laura, "Efficiency in education A review of literature and a way forward" *Journal of the Operational Research Society* 68. 2015 92 (2015).

[22] T. Agasisti, &, J. Berbegal-Mirabent, "Cross-country analysis of higher education institutions' efficiency: The role of strategic positioning" *Science and Public Policy* 48 1 66–79 (2020).

[23] T. Agasisti, &, J. Berbegal-Mirabent, "Cross-country analysis of higher education institutions' efficiency: The role of strategic positioning" *Science and Public Policy* 48 1 66–79 (2020).

[24] H. M. Levin, "Cost-Effectiveness and Educational Policy" *Educational Evaluation and Policy Analysis* 10-1 51–69 (1988).

among the various structures of higher education institutions[25]. The two important variables that determine the Efficiency of higher education institutions are organization structure and the leadership of the institutions. As right stated by Malin Ryttberg & Lars Geschwind[26], there is no one-size-fits-all solution for organizing efficient and effective support. The institution's structure is an evolving element that keeps changing based on the objectives and needs of the new and changed society and the economy. This leads to the balancing act of the organizational structure based on dialogue between academic and support Staff. Upon further review of the leadership roles in motivating and achieving higher output from their team in higher education institutions, it was found that leaders with the following qualities and work approach were viewed in high regard. These qualities and work approach includes the following: the vision of scholarly endeavour, enthusiasm for research and teaching, clearly stated goals, commitment to the job, leading by energetic example as a teacher and scholar, honesty, integrity, fairness, open and participative decision-making, listening to Staff and valuing their opinions, developing and mentoring Staff through delegation and support for learning, and commitment to change and innovation[27] [28].

Research Questions

On the basis of literature review and proposed objectives following are the research questions of proposed study:

- What are the fundamental characteristics that differentiate efficiency from effectiveness of an organisation?
- What are the various models used to measure efficiency of HEI?
- What are the various factors affecting efficiency of HEI?
- What are the various effectiveness models used to study the effectiveness of HEI?

Methodology Employed

The researcher has collected and analysed the existing texts available on efficiency of HEI. The researcher looks into the efficacy of the models in present day and the future of the same through critical and analytical study materials available on various sources. Researcher has collected all the available texts and has analytically examined the entire text. For these purpose articles, books, reports etc. are studied thoroughly.

Efficiency and Effectiveness of HEI

Effectiveness and Efficiency are intertwined concepts in the practical world. It goes hand in hand with an organization, as no organization can be called effective with its efficient processes. Effectiveness is the overall result, but Efficiency is the way or the process of achieving Effectiveness. To be efficient is to accomplish a goal while using the fewest resources possible; to be effective is to accomplish the correct goals and provide high-quality results. Effectiveness and efficiency are not identical. If an organisation is successful in accomplishing its goals but uses more resources than necessary to do so, the organisation can be considered effective but not efficient. On the other hand, an organisation can be efficient without being successful if it maximises the use of its resources but fails to provide results that are meaningful or relevant. Efficiency leads to effectiveness which in turn leads to measuring productivity. As defined by Asia Productivity Organisation[29] (APO):

Productivity = Efficiency + Effectiveness

="Doing things right" + "Doing the right things"

Productivity is listed as a crucial feature in analysing, monitoring, and supervising the performance, and there is a general agreement among academics that performance management is an important component in both the ongoing process of

[25] J. Johnes, "Efficiency measurement" *International handbook on the economics of education* 613–742 (2004).

[26] Ryttberg, Malin & Geschwind, Lars, "Organising professional support staff at higher education institutions: a multidimensional, continuous balancing act" *Tertiary Education and Management.* 27 1-12 (2021).

[27] Paul Ramsden, "Managing the Effective University" Higher Education Research & Development 17:3 347-370 (1998).

[28] D. P. Shrestha, "Managing Higher Education Institutions" *Administration and Management Review* (2009).

[29] Organization A. P, "In-country Training Program for Productivity and Quality Practitioners In IRAN", 2008.

improving management practices and achieving managerial success[30], [31]. In addition to this, it may assist organizations in sticking to their goals, visions, policies, objectives, and targets. In everyday operations, businesses strive to fulfil their mission and goals through a combination of effective and efficient methods, all while making the most of the resources they have at their disposal. For any organization to strive long-term in a competitive world, it needs to develop a model to track its Efficiency continuously. Higher education institutions are no exception to this. Whether government-funded or private institutions, the long-term survival and growth are always determined by Efficiency. Efficiency is reflected at all stages, the input, the process and the output. This cycle of input- process-output for an educational institution is a yearly process. The quality of output of the previous year determines the quality of input it can draw the following year. The variable of measuring the Efficiency of Higher Educational Institutions becomes even more critical as these institutions are the foundations for the nation's skilled workforce. It is essential to understand that being effective does not necessarily imply that one is efficient, and vice versa, because these two concepts deal with separate dimensions of performance. Thus, measuring the Efficiency of an educational institution is critical to its growth. Organisation Effectiveness is one of the famous research areas in the USA (43%), India (10%) and the UK (10%) [32].

7.1 ***Efficiency in HEI's***

Efficiency refers to the process by which inputs can be converted to outputs using optimized resources. To measure efficiency, one requires information on costs, input and output variables and cost function. Including both teaching and research output, multiplicity of different types of output has on costs and on the technology of production in universities can be evaluated[33] . Over a period of time, researchers have used many approaches to measure the efficiency. Approaches ranges from simple least square regression[34] to parametric and nonparametric efficiency estimation techniques capable of evaluating multi-input/output units have been developed. Another most popular approach used for studying the relative efficiency of higher education institutions is DEA framework. DEA stands for Data Envelope Analysis and was the development of the empirically measuring efficiency[35]. DEA method is found to be suitable for studying technical efficiency in the area of management sciences and economics. More than 4000 published articles have used DEA method in analysing the efficiency of the organisation[36]. Efficiency can be studied using two directions – input or output. In context of HEIs as the resources allocated are more or less stable and fixed, output based measure of efficiency is mostly used.

Among the variables used for testing the efficiency of higher education institutions one of the important variables is teaching activity. It is classified as primary activity for an education institution. The objective of teaching is to provide knowledge to the students at all levels of education. The people or the stakeholders involved with this activity are students and teachers. This activity becomes a part of internal quality assurance

The Input variable includes, Number of academic staff, one of the important inputs as highly represented in the literature[37],[38] This variable considered all the teachers involved in the teaching process [39],[40]. The next variable is about

---

[30] Anderson E. W, Fornell C. & Rust R. T, "Customer satisfaction, productivity, and profitability: Differences between goods and services", Marketing Science, pp 129-145(1997).

[31] Acur N & Englyst , "Assessment of strategy formulation: how to ensure quality in process and outcome. International Journal of Operations & Production Management ", Vol-26: 69-91(2006).

[32] Elina. Mikelsone, Elita. Liela, "Idea Management And Organisational Effectiveness: A Research Gap" *Journal of Business Management* No.12 1-23.2016.

[33] Verry, D W & Layard, P R G. "Cost Functions for University Teaching and Research" *Economic Journal, Royal Economic Society* 85(337), pages 55-74(1975).

[34] Johnes, Geraint and Johnes, Jill. "The Persistence of Efficiency" *Expert Systems with Applications* 40, 14, 5661–5672 (2013)

[35] A. Charnes, W.W. Cooper, E. Rhodes. "Measuring the efficiency of decision-making units",*European Journal of Operational Research* 2, 6 429-444 (1978).

[36] Emrouznejad, Ali, Parker, Barnett & Tavares, Gabriel, Evaluation of research in efficiency and productivity: A survey and analysis of the first 30 years of scholarly literature in DEA, *Socio-Economic Planning Sciences*, 42, issue 3, p. 151-157, (2008).

[37] Abd Aziz, Nur Azlina & Mohd Janor, Roziah & Mahdi, Rasidah. "Comparative Departmental Efficiency Analysis within a University: A DEA Approach. Procedia" *Social and Behavioral Sciences* 90. 540-548. 10.1016/j.sbspro.2013.07.124. (2013).

[38] Jill Johnes. "Data envelopment analysis and its application to the measurement of efficiency in higher education" *Economics of Education Review* 25, 3 273-288 (2006).

[39] Abbott, M. and Doucouliagos, C. "The efficiency of Australian universities: a data envelopment analysis" *Economics of Education Review* 22 (1), 89-97(2003).

[40] Young, Michael, Tsai, Terence, Wang, Xinran, Liu, Shubo and Ahlstrom, David. "Strategy in emerging economies and the theory of the firm" *Asia Pacific Journal of Management*, 31, 2, p. 331-354.

expenses i.e the total expenses incurred on employees. Expenses and number of academic staff are highly correlated. The operating expenses are an important factor for performance of the core business of HEIs. And therefore, the input variable, expenses excluding expenses for employees is selected for measuring the effectiveness[41], [42]. The output measured against these inputs include number of graduates i.e., students who passed out of the system by completing successfully the programs[43], [44].

The second input variables used for measuring the efficiency are the number of agreements signed with other institutions. It could be either bilateral or multilateral agreements. The main objective for this agreement is to achieve higher mobility. This is a part of international activity as it is considered as the institutional framework of cooperation of HEIs. The output that can be measured for these agreements are the actual mobility for both students and academic staff. In simple terms it refers to the total number of outgoing and incoming students and faculty members also referred as academic staff. These are a result of student and faculty exchange agreement with various Universities and Higher Education Institutions.

Variables used for measuring Efficiency of HEI

Efficiency and effectiveness are key basis for achieving better results for every organization, irrespective of the industry, sector or the country (Thompson, 1967)[45]. Educational organizations are no different. The main objective of an education institutions is to encourage and develop art and culture and should results in contributing to creating the human resources that focus on better quality of life and maintaining peace in society. The educational institutions should promote new reforms in the sector and help bring in sustainable development of the local communities. Their role can be more specifically defined as change agents of the society. Their basic activities include teaching, research and academic services to the community. Organisations exert influence on the environment and it gets influenced too. Thus, flexibility and adaptability are the key features of the organisation. For an higher educational institutions benchmarking, performance funding, evaluation services, marketing of the organisations and the quality of student input and output will form the variables for assessing the effectiveness. (Alstete, 1995; and Barak & Kniker, 2002, Namitha Elizabeth Jacob & Baby Shari, 2013; Betz, Cunliff & Guinn, 2003)[46], [47], [48], [49].

Over a period of time, various variables have been added to the list of an efficient and effective higher education institutions. For external stakeholders factors like the size, the number of years of existence, the infrastructure, the funds and endowment, the faculty student ratio, the quality and qualification of the teaching faculty members, the development and the learning targets and the leadership (D.L. Clark, L.S. Lotto and T.A. Astuto (1984) ; Namitha Elizabeth Jacob & Baby Shari,2013)[50],[51] are considered. Another aspect that is adopted to understand the effectiveness of the higher education institutions are the level of satisfaction that is experienced by both the internal and the external stakeholders

[41] Abbott, M. and Doucouliagos, C. "The efficiency of Australian universities: a data envelopment analysis" *Economics of Education Review* 22 (1), 89-97 (2003).

[42] McMillan, Melville and Datta, Debasish. "The Relative Efficiencies of Canadian Universities: A DEA Perspective" *Canadian Public Policy* 24 4, p. 485-511 (1998).

[43] Abd Aziz, N.A., Mohd Janor, R.M. and Mahadi, R. "Comparative Departmental Efficiency Analysis within a University: A DEA Approach" *Procedia - Social and Behavioral Sciences* 90 (10), 540–548 (2013).

[44] Sagarra, Agasisti and Mar Molinero. "Exploring the Efficiency of Mexican Universities: Integrating Data Envelopment Analysis and Multidimensional Scaling" *Omega* 67 123-133 (2017).

[45] Thompson, J. D. "Organizations in action: Social science bases of administrative theory" *McGraw-Hill* (1967).

[46] Alstete, J.W. "Benchmarking in Higher Education: Adapting Best Practices to Improve Quality" in *ASHE-ERIC Higher Education Report*, No.5. Washington, DC: George Washington University, Graduate School of Education and Human Development (1995).

[47] Barak, R. & C. Kniker. "Benchmarking by State Higher Education Boards" in *New Directions for Higher education* No.118, pp.93-102 (2002).

[48] Namitha Elizabeth Jacob & Baby Shari. "Organisational Effectiveness in Educational Institutions" *International Journal for Educational Studies*. 6(1), 17-23 (2013).

[49] Betz, D., E. Cunliff & D. Guinn. "Alternative Road to 'Paradise': Growing toward AQIP" in S.E Van Kollenburg [ed]. *Organizational Effectiveness and Future Directions*. Chicago: The Higher Learning Commission of the North Central Association of Colleges and School (2003).

[50] Clark DL, Lotto LS, Astuto TA. "Effective Schools and School Improvement: A Comparative Analysis of Two Lines of Inquiry" *Educational Administration Quarterly*. 1984 Aug;20(3):41-68.

[51] Namitha Elizabeth Jacob & Baby Shari. "Organisational Effectiveness in Educational Institutions" *International Journal for Educational Studies.* 6(1), 17-23 (2013).

like the students, faculty members and staff, parents, grooming of students the industry readiness of the students (W.K. Hoy and J. Ferguson (1985); J.A. Gun and E.A. Holdaway (1986); Anum Siddique et al., 2011)[52],[53],[54].

The quality of academic leadership and its ability to shape the organisation as agile to the ever-changing environment and demands is one of the key factors in finding the right opportunities for the organisation and its growth. This requires a constant motivation of the team from the leader. Apart from motivation, the academic and non-academic staff should be continuously motivated to get trained for higher and better performance. Thus, participation of staff in various workshops conferences and seminars should be highly promoted as a culture of the organisation.

Variables for studying Efficiency in Higher Education Institutions

Sr. No	Variable(s)	Authors
1	Teaching activity, scientific and professional activity and international activity.	Andrea Arbula and Blecich, 2020[55]
2	Females among academic staff, a higher proportion of funds from external sources and more years since HEI establishment have positive effect on efficiency of university.	Wolszczak-Derlacz and Parteka (2011)[56]
3	Their cost function consists of three outputs (students included in the undergraduate education, students included in the graduate education and scholarships for research) and one input (average college salary).	Cohn, Rhine and Santos (1989).[57]
4	Number of students per academic session, employment and number of publications.	Sibel and Bursalioglu (2013)[58]
5	Students' perception of teaching from the perspective of students' interest, teacher and course assessment.	Arbela Blecich and Zaninović (2019)[59]
6	Spending on Education and performance	Hanushek 1994, [60] Thanassoulis and Dustan 1994, [61] Jesson and Grey 1991,[62] Rosenthal 1994[63]

[52] Hoy, W.K. & J. Ferguson. "A Theoretical Framework and Exploration of Organizational Effectiveness of Schools" in *Educational Administration Quarterly* 21(2) pp.117-134 (1985).

[53] Gun, J.A. & E,A, Holdaway. "Perceptions of Effectiveness, Influence, and Satisfaction of Senior High Schools Principals" in *Educational Administration Quarterly* 22(2), pp.43-62 (1986).

[54] Anum Siddique, A. et al. "Impact of Academic Leadership on Faculty's Motivation and Organizational Effectiveness in Higher Education System" in *International Journal of Academic Research* Vol.3 No.3,(2011).

[55] Blecich, Andrea Arbula. "Factors affecting relative efficiency of higher education institutions of economic orientation." *Management* 25, no. 1, 45-67 ,(2020).

[56] Wolszczak-Derlacz J, Parteka A. "Efficiency of European public higher education institutions: a two-stage multicountry approach" *Scientometrics*. Dec 89(3) 887-917 (2011).

[57] Cohn, Elchanan, Sherrie L. W. Rhine, and Maria C. Santos. "Institutions of higher education as multi-product firms: Economies of scale and scope" *Review of Economics and Statistics* 71: 284–90 (1989).

[58] Selim, Sibel & Bursalioglu, Sibel. "Analysis of the Determinants of Universities Efficiency in Turkey: Application of the Data Envelopment Analysis and Panel Tobit Model" *Procedia - Social and Behavioural Sciences.* 89. 895-900 (2013)

[60] Hanushek, E.A. Making schools work: "Improving performance and controlling costs" *Brookings Institution Press*, Washington, DC., UK (1994)

[61] Thanassoulis, E. and P. Dunstan. "Guiding schools to improved performance using data envelopment analysis: An illustration with data from a local education authority". *J. Oper. Res. Soc*., 45: 1247-1262 (1994).

[62] Jesson, D. and J. Gray, "Slants on slopes: Using multilevel models to investigate Differential school effectiveness and its impact on pupils examination results" *Sch. Eff. Sch. Improv*. 2 230-247 (1991).

[63] Rosenthal, R. "Parametric Measures of Effect Size: The Handbook of Research Synthesis" Robert, R. (Ed). *Sage Publications,* New York, USA, ISBN: -87154226-9, pp: 231-244(1994).

7	Size of the Institution	Berger. Et.al.,1993; [64] Isik and Hassan 2002[65]
8	Number of undergraduates postgraduates and academic staff; mean A-level entry score over the last three years; research income; expenditure on library and computing services. Number of successful leavers; number of higher degrees awarded; weighted research rating.	Athanassopoulos UK and Shale (1997)[66]
9	Teaching characteristics; equipment; course contents, intensity of graduate job search, quality of the relation between universities and the lab or market, levels of generic and vocational performance	Joumady and RIS (2005)[67]
10	Number of full time undergraduate and postgraduate students; academic staff; administrative expenditures; expenditures on centralized academic services, Degrees awarded (Graduate and postgraduate) and research income received Staff time, quality of staff, postgraduate input research expenditure and capital inputs (books and area of buildings), prestige of the HEI (reputation measure), index of total number of publications, research publications per academic staff (productivity)	Johnes and Li (2008)[68]
11	Academic staff and number of students, Number of graduates; THES-QS recruiter survey ranking; THES-QS peer survey ranking; published articles; citations	St Aubyn, Pina, Garcia and Pais 2005[69]
12	Number of students, number of PhD students, number of professors, financial resources	Agasisti and P'erez (2010)[70]
13	Cost per undergraduate, full-time faculty (%),students in the top 100/o of their high school class (%)and 25th percentile of entering student's SAT scores, graduation rate	Eckles (2010)[71]
14	Annual operating budget; number of academic staff; number of non-academic staff, amount of internal and external research fund, number of graduates at the undergraduate/master degree levels; employment rate, number of publications in internationally/ nationally refereed journals;	Kantabutra and Tang (2010)[72]

[64] Berger, A.N, W.C. Hunter and S,G, Timme "The efficiency of financial institutions: A review and preview of research past, present and future" *J. Banking Finance,* 17, 221-249,(1993)

[65] Isik, I, and M,K, Hassan. "Technical, scale and allocative efficiencies of Turkish banking industry" *J. Banking Finance*, 26, 719-766,(2002)

[66] Athanassopoulos, AD. and E. Shale. "Assessing the comparative efficiency of higher education institutions in the UK by the means of data envelopment analysis" *Educ. Econ.*, 5: 117-134,(1997)

[67] Joumady, 0. and C. Ris. "Performance in European higher education: A non-parametric production frontier approach" *Educ. Econ* 13189-205 (2005)

[68] Johnes, J. and Y,U, Li. "Measuring the research performance of Chinese higher education institutions using data envelopment analysis", *China Econ. Rev.,* 19: 679-696 (2008).

[69] Miguel St. Aubyn,1 Álvaro Pina, Filomena Garcia, and Joana Pais. "Study on the efficiency and effectiveness of public spending on tertiary education" *European Communities*, 2009

[70] Agasisti, T. and E, C, Perez. "Comparing efficiency in a cross-country perspective: The case of Italian and Spanish state universities" *Higher Educ.*, 59: 85-103.

[71] Eckles, J.E. "Evaluating the efficiency of top Liberal, Arts Colleges" *Res. Higher Educ.*51 266-293 (2010).

[72] Kantabutra, S. and J.C. Tang. "Efficiency analysis of public universities in Thailand" *Tertiary Educ. Manage.* 16 15-33 (2010).

15	Total academic staff, total number of students and total revenues, Number of graduations and number of scientific publications	Wolszczak and Partera (2011)[73]

The Efficiency Assessment Models

DEA technique stands for Data Envelopment Analysis. The DEA model of efficiency was developed by Charnes, Cooper and Rhodes (1978)[74] to measure the relative efficiency of the not-for-profit organisations. The technique is a relative measure of efficiency also referred as non-parametric technique. It uses a comparative ratio of weighted outputs and inputs to arrive at a relative efficiency score of each decision-making unit. This model was later adopted for assessing efficiency of the for-profit organisation because of its quality measurement techniques. Under the DEA Model many models are developed with measurement of specific objectives. The two most popular ones are CCR and BCC. These models are the basic models for assessing the efficiency and it requires clear prior selection of decision-making units and the input and the output variables. [75]

The CCR model of DEA is based on assumption of constant return to scale. CCR technique is used for calculating the overall efficiency of the decision-making unit (DMU). IT incorporates technical and scale efficient as an aggregate measure. The constant element of CCR assumes that increase in one variable i.e., input will result in proportionate increase in Output. The envelopment surface created by CCR techniques of the selected DMUs will take the shape of a convex cone. This results of CCR technique gives clear picture of efficient and non-efficient Decision-Making Units. Another basic model under DEA analysis is the BCC Model. BCC model was developed by Banker et al. (1984)[76] and is used to calculate pure technical efficiency of the DMU. It is based on the concept of variable returns to scale. This model excluded the impact of scale efficiency. This model is used as competitive analysis tools where similar DMUs are compared for their performance and efficiency. Thus, the envelope created under this analysis is a convex hull. In other words, the efficiency obtained by this model is a part calculation of the CCR model.

Later work of researchers developed various models on the similar lines and some were extensions of the DEA models too. The SBM model was introduced by Tone (2001), the additive model was introduced by Charnes et al., (1985), and so on. The extended efforts of DEA models were given by Sexton et al., (1986) which analysed the cross-efficiency, super-efficiency (Andersen and Petersen, 1993) and the returns to scale (Banker, 1984; Banker et al., 2004). The output and the applicability of the results produced by DEA model were competent enough to soon make this model as a widely used research tool to evaluate efficiency in many sectors like Agriculture, Sports, Education, Transportation and Production Control.[77]

DEA is a widely accepted model in studying the efficient of a Higher Education Institutions. Many authors worldwide have used DEA to identify the efficiency of the education institutions. Some of the research works of DEA on Efficient of Higher Education Institutions are in the countries of USA, Canada, Mexico, UK, Italy, Spain, Greece, Taiwan, China, Australia and India.[78]

---

[73] Wolszczak, D.J. and A. Parteka. "Efficiency of European public higher education institutions: A two-stage multicountry approach" *Scientometrics*, 89,887-917,(2011).

[74] A. Charnes, W.W. Cooper, & E. Rhodes, "Measuring the efficiency of decision-making units" Europ. J. Operational Res., 2: 429-444 (1978).

[75] B. Jaiswal, S. Rastogi, L. Shimpi, "A Comparative study of Technical Efficiency of Selected Indian Commercial Banks by Data Envelopment Analysis based CCR and BCC Models" International Journal of Research in Social Sciences 10 (12) (2020).

[76] R. D. Banker, A. Charnes, and W.W. Cooper, "Some models for estimating technical and scale inefficiencies in data envelopment analysis" *Management Science* 30 (9) 1078-1092 (1984).

[77] K. B. Atici, &V.V Podinovski, "Using data envelopment analysis for the assessment of technical efficiency of units with different specializations: An application to agriculture: *Omega* 54, 72-83 (2015).

P. Saxena, "A benchmarking strategy for Delhi transport corporation: An application of data envelopment analysis" *International Journal of Mathematical, Engineering and Management Sciences* 4(1), 232-144 (2019).

S. Singh, "Measuring the performance of teams in the Indian premier league" *American Journal of Operations Research* 1(3), 180-184 (2011).

S. Singh, &P. Ranjan, "Efficiency analysis of non-homogeneous parallel sub-unit systems for the performance measurement of higher education" *Annals of Operations Research* 269(1-2), 641-666 (2018).

[78] T. Agasisti & L. Ricca, "Comparing the efficiency of Italian public and private universities (2007- 2011)" *An empirical analysis. Italian Economic Journal* 2(1) 57-89 (2016).

M. Abbott & C. Doucouliagos, "The efficiency of Australian universities: A data envelopment analysis" *Economics of Education Review* 22(1) 89-97 (2003).

S.C. Ray & Y. Jeon, "Reputation and efficiency: A non-parametric assessment of America's top-rated MBA programs" *European Journal of Operational Research* 189(1), 245-26 (2008).

Thus, it can be concluded that for studying the effectiveness of the Higher Education Institution, Pounder Model is one of the most preferred one and for studying the efficiency the DEA model is the most reliable one.

7.2 Effectiveness in HEI

The idea of effectiveness refers to concerns regarding an organisation's capacity to acquire and utilize resources, thus helping in the attainment of its objectives[79].According to Cameron (1978), organizational effectiveness refers to the organization's ability to efficiently acquire and utilize the necessary resources.

It is necessary to acknowledge that the effectiveness of a higher education institution might fluctuate based on its institutional objectives, encompassing research universities, liberal arts colleges, community colleges, and vocational schools. The definition of effectiveness may vary depending on the specific objectives of the school and the demographic of students it caters to. The term "effectiveness" pertains to the degree and quality by which higher education fulfils these objectives[80]. Moreover, the notion of efficacy has the potential to undergo transformation when society requirements and expectations undergo shifts.

The Model: The Pounder Model of Effectiveness

The Pounder Model of Organisational Effectiveness is one of the most prominent Efficiency models used by many researchers that draw significant attention to the study of the Efficiency of Higher Education. This model is based on the study conducted by researchers in the state of Hongkong in 1997. This model drew much attention as it studied Efficiency by creating a multidimensional scaling[81], [82] analysis. This model has been used in more than 40 research works as the analytical model to identify the organizational effectiveness of higher education institutions[83].

M. Sagarra, C. Mar-Molinero, & T. Agasisti, "Exploring the efficiency of Mexican universities: Integrating data envelopment analysis and multidimensional scaling" *Omega* 67 123-133 (2017).

E. Thanassoulis, P.K Dey, K. Petridis, I. Goniadis, & A.C. Georgiou, "Evaluating higher education teaching performance using combined analytic hierarchy process and data envelopment analysis" *Journal of the Operational Research Society* 68(4), 431-445 (2017). E. Thanassoulis, M. Kortelainen, G. Johnes, & J. Johnes, "Costs and efficiency of higher education institutions in England: A DEA analysis. Journal of the Operational Research Society", 62(7), 1282- 1297 (2011).

J.L. Ruiz, J.V. Segura, & I. Sirvent, "Benchmarking and target setting with expert preferences: An application to the evaluation of educational performance of Spanish universities" *European Journal of Operational Research* 242(2), 594-605 (2015).

C. Kao, & H.T. Hung, "Efficiency analysis of university departments: An empirical study" *Omega* 36(4), 653-664 (2008).

J. Johnes, & Li. Yu, "Measuring the research performance of Chinese higher education institutions using data envelopment analysis" *China Economic Review* 19(4) 679-696 (2008).

S.K. Jauhar, M. Pant, & R. Dutt, "Performance measurement of an Indian higher education institute: A sustainable educational supply chain management perspective" International Journal of System Assurance Engineering and Management, 9(1), 180-193 (2018).

P. Tyagi, S.P. Yadav, & S.P. Singh, "Relative performance of academic departments using DEA with sensitivity analysis" *Evaluation and Program Planning* 32(2) 168-177 (2009).

B.K. Sahoo, R. Singh, B. Mishra, & K. Sankaran, (2017). "Research productivity in management schools of India during 1968-2015: A directional benefit-of-doubt model analysis" *Omega* 66, 118-139.

[79] Federman, M. (2006). Essay: Towards an effect-ive theory of organizational effectiveness, Available at http://whatisthemessage.blogspot.com/2006_03_01_archive.html

[80] Steven Brint & Charles T. Clotfelter, "U.S. Higher Education Effectiveness", The Russell sage foundation journal of the social sciences, 2(1) 2-37 (2016)

[81] Quinn. R.E, and Rohrbaugh. J, "A Competing Values Approach to Organisational Effectiveness" *Public Productivity Review* 5(2) 122–40 (1981).

[82] Quinn. R.E, and Rohrbaugh. J, "A Spatial Model of Effectiveness Criteria: Towards a Competing Values Approach to Organisational Analysis" *Management Science* 29(3) 363–77 (1983).

[83] Pounder. J.S, "Measuring the Performance of Institutions of Higher Education in Hong Kong: An Organisational Effectiveness Approach", PhD diss. *Brunel University/Henley Management College* (1997).

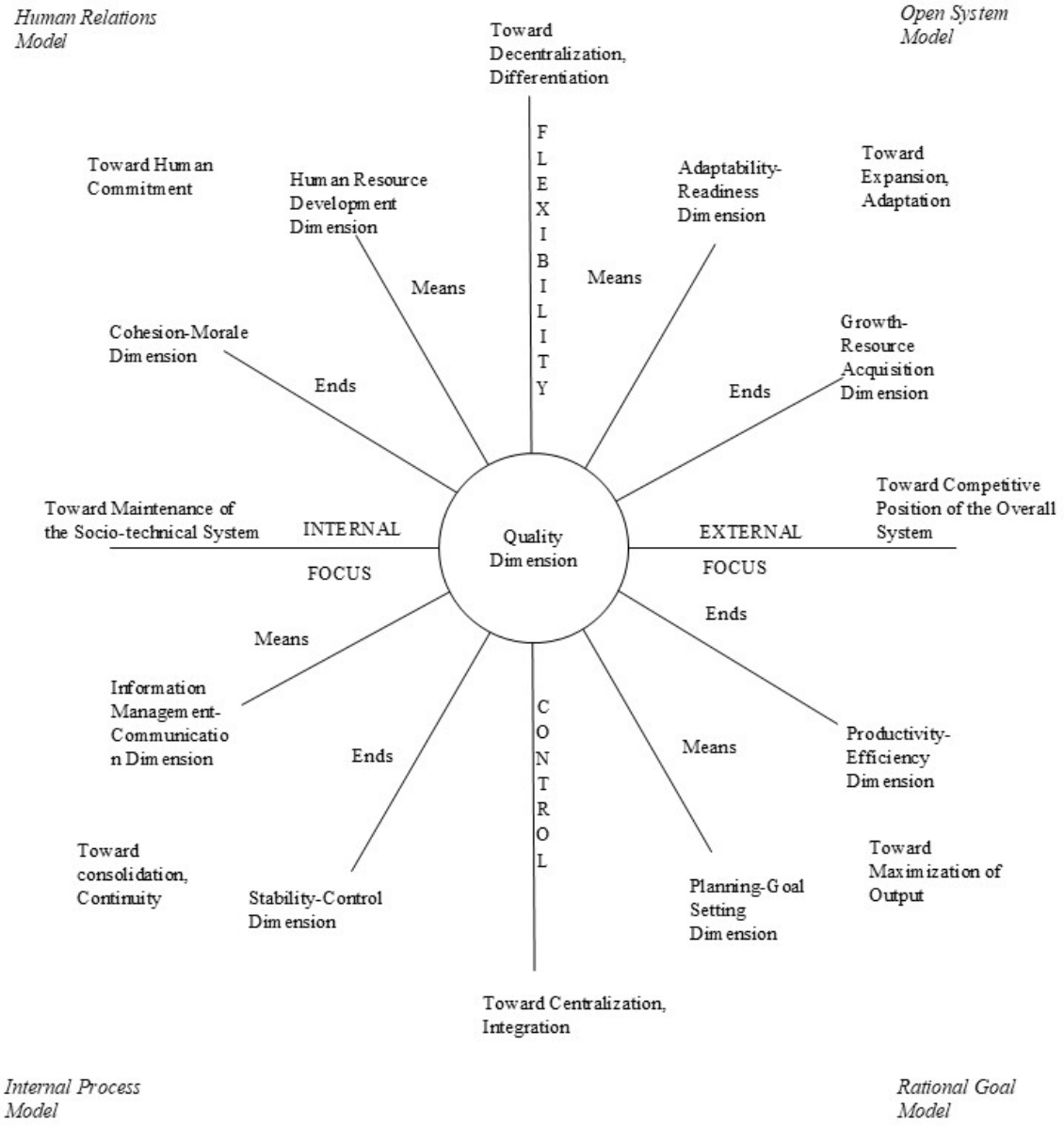

Figure 1: Organizational effectiveness: The Competing Values Framework

The model has four quadrants

a) The Rational Goal Model (**lower right quadrant)** emphasizes control and external focus and stresses planning and goal setting (as means) and productivity and efficiency (as ends).

b) The Internal Process Model (**lower left quadrant)** emphasizes on control and internal focus and stressing the criteria of information management and communication (as means) and stability and control (as ends).

c) The Human Relations Model (**upper left quadrant)** emphasizes on flexibility and internal focus and stressing cohesion and morale (as means) and human resources development (as ends).

d) The Open System Model (**upper right quadrant**) based on flexibility and external focus and emphasizing adaptability and readiness (as means) and growth, resource acquisition and external support (as ends).

e) Quality: The model-based quality at the centre as it was concluded in the study of Quinn & Rohrbaugh's study that quality 'may be an important element of any or all.

The model developed the effectiveness self-rating scales using the Competing Values Frameworks dimensions from the work of Quinn and Rohrbaugh – 1981 &1983. It further tweaked the Behaviourally Anchored Rating scales of Smith and Kendalla -1963[84] to design a reliable rating scale applicable to study the organizational effectiveness of Higher Education Institutions. This resulted in identifying nine organizational effective dimensions (Quinn and Rohrbaugh, 1981, 1983) for a higher education institution. These nine dimensions are productivity–efficiency, quality, cohesion, adaptability–readiness, information management-communication, growth, planning–goal setting, human resources development, stability–control. Managerial staff of various levels was involved in scale development, thus ensuring the holistic approach to measuring the effectiveness.

The scales and the four dimensions of effectiveness presented in the model are generic and applicable to All Higher Education Institutions across the globe with minor modifications.

Variables and Dimensions of the Pounder Model – A detailed analysis

The usefulness of the competing value framework in comprehending the significance of applying the model to analyse the efficacy of Higher Education Institutions in India has been proven. The Higher Education Institutions in India are classified under five different categories based on its formation and organisation structure. The detailing of the components will help in establishing the relevance and its applicability for effectiveness study for Indian setups.

The Components

A) Open System Model (Quadrant 1)

Means: Adaptability Readiness dimension

Adaptability Readiness dimension include variables that assess the behaviour connected with organisation's adaptability in response to the change as per market requirements over a period of time. This helps in evaluating the flexibility element built in the structure, programmes and courses to change as the need arises. This describes the extent to which the organisation is prepared to adapt to the change.[85]

Ends: Growth resource acquisition dimension

The growth dimension reflects the ability of an organisation to secure the external support, acquire the new resources as needed and its ability to increase its capabilities.[86]

Towards expansion, adaptation

Flexibility: Towards decentralisation, differentiation

When considered from the outcome perspective the variables in the quadrant one requires innovativeness and adaption as the basic qualities in the manager. This will help create new business opportunities and expansion activities. The role of manager here requires him/her to have external focus and flexibility towards change. The managerial roles as innovator and broker are the needed for this quadrant. If the manager can bring in the common vision for the staff that leads to excitement for risk taking.[87]

B) Rational Goal Model (Quadrant 2)

Means: Planning Goal setting dimension

This role requires the manager to display the ability for planning and goal setting for the future. The role requires to set goals, objectives and develop a systematic plan for the organisation performance. The following points that can be used to devise the scale for assessing the performance reflecting how well or worst the planning and goal setting is done in the concerned organisation.

Below listed are the variables for assessing the goal setting dimension:[88]

---

[84] Smith. P.C, and Kendall. L.M, "Retranslation of Expectations: An Approach to the Construction of Unambiguous Anchors for Rating Scales" *Journal of Applied Psychology* 47 149–55 (1963).

[85] *Ibid.*

[86] *Ibid.*

[87] Wood. John & Vilkinas. Tricia, "Characteristics associated with success: CEOs' perspectives" *Leadership & Organization Development Journal*. 26. 186-196. (2005). 10.1108/01437730510591743.

[88] Pounder. J. S, "New leadership and university organisational effectiveness: exploring the relationship", *Leadership & Organization Development Journal* 22(6) 281 – 290 (2001).

Different committees and their way of dealing with planning and coordinating activities	Powerful members of the senior management team and their understanding of, or interest in, long-term development
Management's understanding and direction towards priority areas for present and future	Management's approach to deal with open mind aspects of planning, preferring to plan within a framework which limits strategic options
Plan or view on future direction and the readiness for implementation strategy	Establishment of Planning committee with senior management team to regularly review of institution's mission, objectives and strategies
Regular review of institutional plan, with mission, goals and strategies	Circulation of institutional plan, with mission, goals and strategies widely amongst members of staff.
Establishment of long-term goals and are they consistent with the institution's traditions.	Does the institutional plan coherent, covering mission, broad aims, specific objectives to actions and provide a framework which allows each lower-level unit to define its own objectives and action plans

Ends: Productivity- efficiency dimension

This aspect of an organization's performance has to do with behaviour that reflects the extent to which it is concerned with the quantity or volume of what it produces and the cost of operation.

Below listed are the variables for assessing the Productivity -efficiency dimension:[89]

Mechanism for Assing Productivity and Efficiency	Expectation of meeting the external norms and less attention to efficiency is ok
The focus of evening and extension courses based on cost, drive and low unit costs	Productivity-efficiency is the base for judging the new programmes and related decisions
Incentives for efficient use of resources to departments and individuals	Rationalization (e.g. grouping of departments into faculties or schools) with a view to improving productivity and efficiency.
Establishment of budget centres have been carried out with a view to improving productivity and efficiency	Regular meetings at all levels devoted to improving productivity and efficiency.

Towards maximisation of output

External Focus: Towards competitive position of the overall system

Control: Towards centralisation, integration

Within quadrant 2, the organisational outcomes are maximisation of output. The manager is required to complete the tasks at hand, to motivate staff, set goals and objectives and to clarify roles. The producer and director are the roles associated with this quadrant. Staff are motivated by desire to complete the task at hand.[90]

C) Internal Process Model (Quadrant 3)

Means: Information Management Communication dimension

This aspect of an organization's performance has to do with behaviour that reflects the extent of its ability to distribute timely and accurate information needed by its members to do their jobs.

Below listed are the variables for assessing the Information Management Communication dimension:[91]

Publicity to major developments like setting up a new unit	Information provision to be 'ad hoc' being provided when requested
Information produced centrally to be consigned to the waste bin frequently	Widespread use of the 'confidential' and 'restricted' stamp on documents and reports.

[89] Pounder. J. S, "New leadership and university organisational effectiveness: exploring the relationship", *Leadership & Organization Development Journal* 22(6) 281 – 290 (2001).

[90] Wood. John & Vilkinas. Tricia, "Characteristics associated with success: CEOs' perspectives" *Leadership & Organization Development Journal*. 26. 186-196. (2005). 10.1108/01437730510591743.

[91] Pounder. J. S, "New leadership and university organisational effectiveness: exploring the relationship", Leadership & Organization Development Journal 22(6) 281 – 290 (2001).

Both formal and informal channels are used for information	A management information provision unit to have been established
Minutes of governing body meetings (e.g. Board of Governors/Council/Academic Board) to be made available to all staff.	Information bulletins from management, and meetings, to focus primarily on developments that have already taken place
Cascading information systematically from top to bottom of the organizational hierarchy	

Ends: Stability Control dimension

This aspect of an organization's performance has to do with behaviour that reflects the extent of its ability to control the flow of work, to direct the behaviour of its members and to maintain the organization's continuity, particularly under periods of pressure or threat.

Towards Consolidation, continuity

Internal focus: Towards maintenance of socio- technical systems

Contrast this with quadrant 3 and the paradox becomes apparent. In times when the organisation requires consolidation and continuity, the manager must demonstrate an internal focus and seek stability. The roles associated with this quadrant are monitor and coordinator. Staff in this environment seek certainty and predictability.[92]

D) Human Relations Model (Quadrant 4)

Means: Human Resource Development Model

This aspect of an organization's performance has to do with behaviour that reflects the extent to which it is responsive to the individual needs of its staff. It also has to do with the extent to which the institution facilitates participation in decision making. Additionally, this aspect is concerned with behaviour relating to the hiring, training and development of staff

Ends: Cohesion -Morale Dimension

Definition: This aspect of an organization's performance has to do with behaviour which reflects the extent to which it is concerned with staff morale, interpersonal relationships, teamwork and sense of belonging

Below listed are the variables for assessing the Cohesion -Morale Dimension:[93]

General lack of informal contact amongst staff members	Feelings of loyalty and sense of belonging to be undermined by an approach to human relations issues (e.g. to contract renewal) which generates insecurity.
Frequent conflicts between the centre and subunits, between academic and administrative units, between one academic or administrative unit and another, and between individuals.	Staff to demonstrate greater allegiance to the parent faculty or department than to the institution as a whole.
Commitment to the maintenance of staff morale	Foster allegiance to parts of the organization in the face of growth or to limit expansion
Senior management team to visit academic and administrative units regularly and talk freely and informally with members of staff.	Staff to regularly refer to their sense of commitment to the institution.
Senior management's role in taking positive steps to create a climate in which employees at all levels are made to feel valuable members of the organization	

[92] Wood. John & Vilkinas. Tricia, "Characteristics associated with success: CEOs' perspectives" *Leadership & Organization Development Journal*. 26. 186-196. (2005). 10.1108/01437730510591743.

[93] Pounder. J. S, "New leadership and university organisational effectiveness: exploring the relationship", *Leadership & Organization Development Journal* 22(6) 281 – 290 (2001).

Towards Human Commitment

In contrast, in quadrant 4 the focus is on human commitment. Here the manager is required to seek opinions, negotiate, be aware of staff needs and support and develop staff. The two roles in this quadrant are mentor and facilitator. Staff here are motivated by the concern shown by their manager. (Tricia Vilkinas, Tricia Vilkinas, 2005)

Quality Dimension

This aspect of an organization's performance has to do with behaviour that reflects the extent to which it is concerned with the quality of what it produces.

The competing values framework helps in deciding the job description and the qualifications required for each role. This model and its dimensions are used by many researchers in studying the efficiency in various organisations and have suggested the appropriates of the number of roles or the need for interchangeability based on their findings in their studies. One such study was done by Denison et al. (1995)[94], to study the convergent -discriminant validity. The results suggest that for managers to be effective, their role as facilitator and mentor as well as coordinator and monitor needs to be exchanged. This model was used by US Air Force commanders in the study conducted by Buenger et al. (1996)[95], suggested that though the model's four constructs are valued but were not equally emphasised offering support to the model. Another study on hospital managers and supervisors also stated the same support to the four-quadrant structure model Kalliath et al. (1999)[96]. Study by Hooijberg and Choi (2000)[97], suggest six roles instead of eight roles. The study used confirmatory factor analysis and found higher correlations existed among some roles. The roles of producer, director and coordinator seems to have shown higher correlation. Many studies supported the four-quadrant structure and found support for its application in Organisation culture (Wyse and Vilkinas, 2004; Howard, 1998)[98] against that researcher like Lamond, 2003 have suggested a two dimensional framework as a more valid and reliable measure in county of Australia. In the higher education segment, the model has been tested in various department with funded outputs like research departments at universities. The study found that the research supervisor's role is similar as manager, the difference is only the setting [99] Vilkinas (2002). Another important observation was the supervisors that the role of innovator and broker was not performed by the research supervisors, thus restricting the number to six roles only.

Conclusion

There are two dimensions of studying the overall performance of an institution. One is the effectiveness dimension and the second one is efficiency. The study was conducted to find out various tools, techniques and models available to study the effectiveness and efficiency of and organization in general and Higher Education Institutions in particular.

Various variables used by past researchers for studying Efficiency in Higher Education Institutions are explored. Another approach used by various researchers for studying the relative efficiency of higher education institutions is DEA framework. DEA stands for Data Envelope Analysis. DEA method is found to be suitable for studying technical efficiency in the area of management sciences and economics. The competing values framework helps in deciding the job description and the qualifications required for each role. This model and its dimensions are used by many researchers in studying the efficiency in various organizations and have suggested the appropriates of the number of roles or the need for interchangeability based on their findings in their studies. In the higher education segment, the model has been tested in various departments with funded outputs like research departments at universities. Each model's key features were highlighted to understand its pros and cons for application in the study of effectiveness. Similarly for the efficiency dimension Data Envelopment Analysis (DEA), CCR, BCC and SBM models were thoroughly researched for its pros and cons and the feasibility of application in the study of efficiency of Higher Education Institutions.

Thus, for studying the effectiveness of the Higher Education Institution, Pounder Model is one of the most preferred one and for studying the efficiency the DEA model is the most reliable one.

---

[94] Denison, Daniel R, and Aneil K, Mishra. "Toward a theory of organizational culture and effectiveness." Organization science 6, no. 2 ,204-223,(1995).

[95] Buenger, V. Daft, R. L., Conlon, E. J., & Austin, J. (1996). Competing values in organizations: Contextual influences and structural consequences. Organization Science, 7(5), 557–576.

[96] Kalliath, T. J., Bluedorn, A. C., & Gillespie, D. F. "A confirmatory factor analysis of the competing values instrument" *Educational and Psychological Measurement, 59*(1), 143–158,(1999).

[97] Hooijberg, R., & Choi, J. "Which leadership roles matter to whom? An examination of rater effects on perceptions of effectiveness" *The Leadership Quarterly, 11*(3), 341–364 (2000).

[98] Wyse, A. and Vilkinas, T. "Executive leadership roles in the Australian Public Service" *Women in Management Review*, Vol. 19 No. 4, pp. 205-11,(2004)

[99] Vilkinas, Tricia. "The PhD Process: the Supervisor as Manager" *Education + Training. 44*, 129-137,(2002)

References

Reference Books:

1. Kim S. Cameron, David A.Whetten, Organizational effectiveness,1983.
2. Kim S. Cameron, William Russell Kelly, Organizational Effectiveness, The International Library of Critical Writings on Business and Management series.
3. William W. Cooper, Lawrence M. Seiford, Kaoru Tone, Data Envelopment Analysis,2007
4. Joe Zhu(Ed.),Data Envelopment Analysis: A Handbook of Models and Methods,2015.

Articles:

5. Bright, D. S., Cameron, K. S., & Caza, A. The amplifying and buffering effects of virtuousness in downsized organizations. Journal of Business Ethics, 64(3), 249–269, (2006).
6. Wyse, A. and Vilkinas, T. "Executive leadership roles in the Australian Public Service" Women in Management Review, Vol. 19 No. 4, pp. 205-11,(2004)
7. Pounder. J. S, "New leadership and university organisational effectiveness: exploring the relationship", *Leadership & Organization Development Journal* 22(6) 281 – 290 (2001)
8. Wood. John & Vilkinas. Tricia, "Characteristics associated with success: CEOs' perspectives" *Leadership & Organization Development Journal*. 26. 186-196. (2005).
9. Pounder. J.S, "Measuring the Performance of Institutions of Higher Education in Hong Kong: An Organisational Effectiveness Approach", PhD diss. *Brunel University/Henley Management College* (1997).
10. Elina. Mikelsone, Elita. Liela, "Idea Management and Organisational Effectiveness: A Research Gap" *Journal of Business Management* No.12 1-23.2016.
11. Blake. Robert R, and Jane S. Mouton "Theory and Research for Developing a Science of Leadership" Journal of Applied Behavioural Science,18, 275-91 (1982).
12. Organization A. P, "In-country Training Program for Productivity and Quality Practitioners In IRAN", 2008.
13. Anderson E. W, Fornell C. & Rust R. T, "Customer satisfaction, productivity, and profitability: Differences between goods and services", Marketing Science, pp 129-145(1997).
14. Acur N & Englyst, "Assessment of strategy formulation: how to ensure quality in process and outcome. International Journal of Operations & Production Management ", Vol-26: 69-91(2006).
15. Baker. K, & Branch. K. M, "Concepts underlying organizational effectiveness: Trends in the organization and management science literature" Management Benchmark Study. USA: Office of Planning & Analysis, Department of Energy (2002).
16. Mintzberg, H, "The Nature of Managerial Work. New York: Harper & Row",(1973).