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ABSTRACT :

Higher education institutions ought to be centres of learning as well as knowledge creation. Ne w knowledge is generated through research activities carried out by its faculty. There are various parameters for ranking an institution such as curriculum standards, student placement record, admission demand, high profile faculty, investment and infrastructure facilities, alumni accomplishments etc. Going by this, the prime objective of a higher education institution is often forgotten. ABC model recently developed by Aithal P.S & Suresh Kumar P.M., focus on measuring annual research performance of higher educational institutions. According to this model, an organization can calculate its annual research performance using its annual research output by taking into account the following factors such as the number of articles published in refereed journals, the number of books published, and the number of chapters in edited book or number of business cases published in Journals. Studying the implications of a system or model considering all determinants in key areas and analysing the key issues to identify the effective factors and its critical constituent element is the task of ABCD analysis model. In this paper, we have attempted to apply ABCD analysing technique on ABC model of annual research productivity of higher educational institutions.

Keywords : ABC model of annual research productivity, ABCD analysis of a model, Research in higher educational institutions.

1. Introduction

There are various parameters for ranking an institution such as curriculum standards, student placement record, admission demand, high profile faculty, investment and infrastructure facilities, alumni accomplishments etc. Going by this, the prime objective of a higher education institution is often forgotten. As to why the performance of higher educational institutions should be based on sole criteria of Institutional Research Performance (IRP). Has been described at length in the recently published ABC model on annual research productivity [1], based on six postulates. This model measures research productivity of higher educational institutions based on calculating institutional research index and weighted research index. The institutional research productivity is calculated using a metric which consists of three institutional variables and one parameter. The three variables are identified as (A) Number of Articles published in peer-reviewed journals, (B) Number of Books published, and (C) Number of Case studies and/or Book Chapters published during a given time of observation. The parameter used is a number of full-time Faculty members (F) which remains constant during the given period of observation.

2. ABC Model

ABC model for measuring institutional performance [1-3] is based on following postulates.
Postulate 1: The Quality of higher education depends on the ability of the institution in new knowledge creation.

Postulate 2: The ability of new knowledge creation of the institution depends on the institutional research and publications by both faculty members and students.

Postulate 3: The institutional publication is measured by calculating its annual average publications.

Postulate 4: The institutional publication ability is measured by its annual publications in terms of the number of Articles published in Journals (A), the number of Books published in the subjects/Edited volumes (B), and the number of Business cases and Book chapters (C) published.

Postulate 5 : The Research productivity (P) of the institution can be measured by knowing research index (α) and weighted research index (β), which shall be calculated using average publications in Journals, average publications of books and an average number of publications of Business cases.

The research index per year (α) is calculated using the formula $\alpha = (2A + 5B + C)/F$, and the weighted research index (β), per year, is calculated using the formula $\beta = (2A + 5B + C)/8F$, where A = No. of publications in Journals in that year, B = No. books published in that year, C = No. of Publications of Business Cases published in that year, and F = No. of full-time Faculty members in that institution during that year. In the above formula, the weightage for a research article A is two and that of book B is five and the case study is one, based on a quantified assumption of the relative significance & efforts involved in generating it arrived at through a summated scaling technique.

Postulate 6: The annual research productivity (research index α) of the organization decides institutional ranking.

Research index is calculated using following formulae:

Research productivity index of the Higher Education Institution $= (2A + 5B + 1C) / F$, where A is number of papers published in reviewed & indexed Journals with ISSN number during a given year, B is number of books published with ISBN number during a given year, and C is sum of number of business cases and book chapters published during a given year. F is number full-time faculty members of the institution during a given year.

Institutional Research productivity index $= [(2A + 5B + 1C) / F]$ ---- (1)

The weighted average is an average in which each quantity to be averaged is assigned a weightage. These weightages determine the relative importance of each quantity on the average. Weightages are the equivalent of having that many like items with the same value involved in the average. Weighted Research productivity index of the Higher Education Institution are calculated using following formula:

Weighted Research Productivity index $= [(2A + 5B + 1C) /8] / F$ --------- (2)

Where A is the number of papers published in reviewed & indexed Journals with ISSN number during a given year, B is the number of books published with ISBN number during a given year, and C is the sum of the number of business cases and book chapters published during a given year. F is number full-time faculty members during a given year [4].

3. About ABCD Framework

An alternative analysing technique devised by Aithal P.S. et. al. [5] for analyzing any business model/strategy/concept/system and to study its effectiveness in providing value to its stakeholders and sustainable output is named as ABCD analysing technique. Application of ABCD analysis results in an organized list of a business Advantages, Benefits, Constraints, and Disadvantages in a systematic matrix. The entire framework is divided into various identified determinant issues and various key issues affecting the model and analyzed under affecting factors and further derived suitable critical effective elements. This analyzing technique being simple gives a guideline to identify and analyze the effectiveness of any business model, business strategy, business concept/idea, and business system.

Reshma et. al. [6], have analyzed the characteristics of "Working from Home" e-business model using 'ABCD Analysis Technique'. Based on various factors which decide the Working from Home system, a model of various factors and their constituent critical elements affecting under organizational objectives, employers point of view, employees point of view, customers/students point of view, environmental/societal point of view and system requirements are derived from a qualitative data collection instrument namely focus group method. It is found that the factors supporting advantages and benefits are more effective compared to constraints and disadvantages of this model so that working from the home model may become more popular from the perspective of employers and employees in the organization in the future.

ABCD analysis framework is used for analysing Black ocean strategy concept [7]. The various factors & their constituent critical factors affecting the BOS concept adopted in some of the business organizations for quick relief from the problems are identified for organizational point of view, administrative point of view, employee point of view, operational point of view, business point of view and external issues point of view are determined under the four constructs - advantages, benefits, constraints, and disadvantages.

ABCD analysis framework is also used for analysing National Assessment and Accreditation Council (NAAC) accreditation process on higher education institutions [8]. The various features of the NAAC accreditation system is evaluated based on identifying and analyzing the advantages, benefits, constraints, and disadvantages of some of the chosen issues like organizational issues, Faculty performance issues, student development/progression issues, social/environmental/community engagement issues, Infrastructure And Learning resources, and Issues on Innovations Creativity and Best Practices. The affecting factors under these issues found out using focus group method and the constituent critical elements under each factor are identified. The result supported the logic of using ABCD analyzing technique in any System/concept performance evaluation.

ABCD analysis framework has been used for analysis of a concept Higher Education Stage Model [9]. The characteristics of the concept are evaluated based on identifying and analyzing the advantages, benefits, constraints, and disadvantages. The result supported the logic of using ABCD analyzing technique in any concept/idea performance evaluation.

In another paper on Study on ABCD Analysis Technique for Business Models, business strategies, Operating Concepts & Business Systems, the author discussed the detailed ABCD framework for quantitative studies and explained how this framework can be used for four specific instances namely Business model, Business strategy, Operational concept and Functional system are outlined here. Finally, ABCD analysing framework is compared with other known analyzing techniques like SWOC, Competitive Profile Matrix (CPM) analysis, EFE & IFE Matrices, BCG analysing frameworks, Porter's Five Forces Model, and PESTLE Analysis [10].

Application of ABCD Analysis Framework on Private University System in India is another paper published using this model in which for six determinant issues related to the functioning of a University has been chosen. These are Organizational aspects, Students Progression, Faculty development, Societal & other stakeholders issues, Governance, Leadership, and Issues on Innovations and Best Practices. Four key issues were identified under each of these and critical constituent elements under these factors are worked out. Through this analysis, 192 critical constituent elements which satisfy the success of a private university have been explored [11-12]. Recently, another paper on Study of New National Institutional Ranking Framework (NIRF) System using ABCD Framework [13], is published in which the ranking system is evaluated using four constructs Advantages, Benefits, Constraints, and Disadvantages, this system consider all determinant issues in key areas through analyzing the major issues and identifying the critical constituent elements and concluded that NIRF provides a

comprehensive ranking suitable for higher educational institutions and it takes care of many small and subtle aspects comparable to quality assessment criterion of National Assessment and Accreditation Council. Apart from using ABCD framework for Qualitative analysis, in several research studies, ABCD analysis is limited and simplified to only listing of various advantages, benefits, constraints, and disadvantages of either concept, models, systems, strategies, technology, or ideas [5]. These studies on ABCD listing [14-23] can be analysed in detail using ABCD framework either qualitatively or quantitatively for further research.

4. ABCD Listing of ABC Model :

Any innovative concept or business model can be analysed using either SWOC or newly developed ABCD analysis method. ABCD analysis contains two varieties as ABCD listing and Application of ABCD framework, which are two models of qualitative analysis method and quantitative analysis method respectively. In this section, we have used ABCD analysis for a qualitative listing of advantages, benefits, constraints and disadvantages of ABC model on annual research productivity.

(a) Advantages of ABC Mode to all Stakeholders :
- Boost to research
- Reputation
- Image
- Efficiency
- Spirit of enquiry
- Research orientation in curriculum
- Promote employability
- Integration of research in curriculum
- Desire to acquire knowledge
- Enhances superiority
- Academic opportunity
- Career development
- Promotes Scientific temper
- Pride in institution
- Preference for admission
- Acceptability in society
- Encourages research
- Co-operation & support
- Good image
- Identify productive institutions

(b) Benefits of ABC Model to all Stakeholders
- More Publications
- Brand Building
- Popularity
- Knowledge creation
- Enhanced learning practices
- High standards
- Enhanced versatility
- Enriched curriculum
- Upgrade knowledge
- Become distinguished
- Forms of expression
- Growth and fulfilment

- Enhances critical thinking
- Identification
- Better performance
- Scope for employment
- Recognizes worthiness of institution
- Increased collaboration
- Trust
- Tap potentials of the organization

**(c) Constraints of ABC Model to all Stakeholders:**
- Motivated Faculty
- Sustainability
- Bias
- Reflect in learning
- Unending pursuit
- Necessity to update fast
- Places greater expectations
- Limited scope
- Commitment
- Team-work
- Treat to idleness
- True indicator
- Inadequate pedagogy
- Improbability goal attainment
- Chances of rejection
- Limited employability skills
- Absence of feedback
- Subjectivity
- Deficit information
- Unable to deliver expectations

(d) Disadvantages of ABC Model to all Stakeholders
- Creating interest
- Competition with other institutions
- Single parameter judgment
- No direct bearing
- Constant effort
- Catch-up with time
- Not essential for all jobs
- Class with the course structure
- Motivation
- Comparison
- Insecurity
- Instant rewards
- Slow result
- Unhappiness
- Decreased interest
- No job guarantee
- Misinformation
- Loose support

- Negative discrimination

5. ABCD Framework Applied to ABC Model:
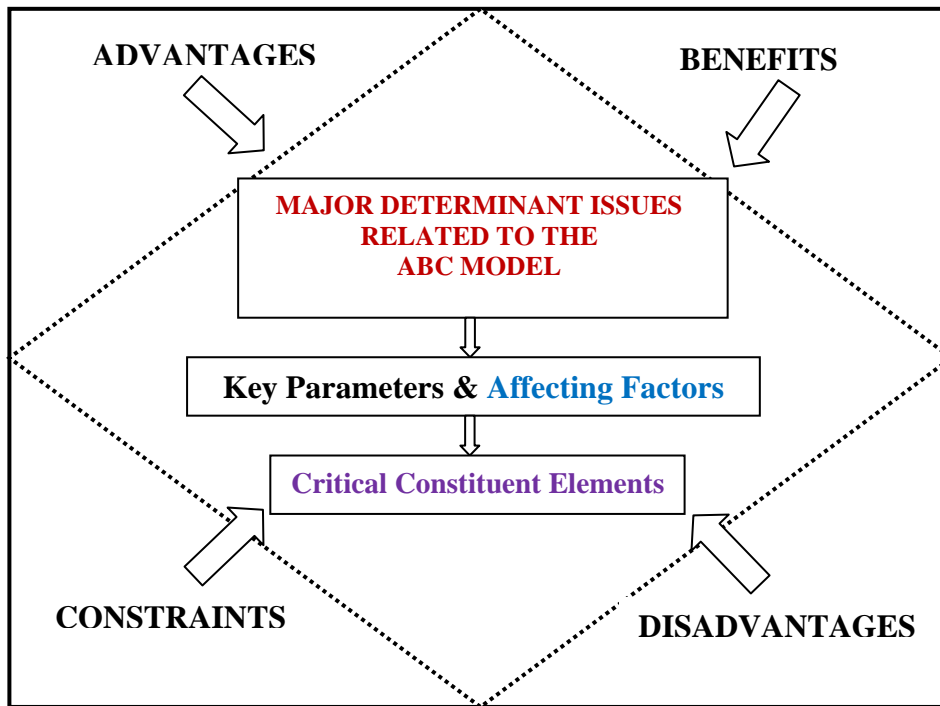
Figure 1: Block diagram of issues affecting the ABC model of organizational performance as per ABCD framework.

Advantages, Benefits, Constraints and Disadvantages (ABCD) of a System can be used to analyze and understand the model/system in an effective way. As per this analysis technique [5], the effectiveness of a business model/concept/system can be studied by identifying and analyzing the advantages, benefits, constraints, and disadvantages by considering various determinant issues like organizational objectives, employers and employees perspective, customer/student perspective and environmental/ social perspective. The block diagram of issues affecting the ABC model of organizational performance as per ABCD framework is shown in fig. 1. The various determinant issues affecting the ABC model of annual research productivity of an organization include Organizational issues, Academic & Curriculum Issues, Faculty Issues, Students Issues, and Other Stakeholders Issues. Each determinant issue has sub-issues called key parameters/properties used for analyzing the advantages, benefits, constraints and disadvantages, the four constructs of the framework. The key parameters for ABCD constructs in case of the ABC model of organizational research performance are Research, Ranking, Perception, and Utility. The factors affecting the various determinant issues of the ABC model for each key parameters under four constructs are derived by a qualitative data collection instrument namely, focus group method [24-32] and are listed in table 1.

Table 1 : Analysis of ABC Model using ABCD framework.

Key parameters	Advantages	Benefits	Constraints	Disadvantages
Organizational Issues				
Research	Boost to research	More Publications	Motivated Faculty	Creating interest

Ranking	Reputation	Brand Building	Sustainability	Competition with other institutions
Perception	Image	Popularity	Bias	Single parameter judgment
Utility	Efficiency	Knowledge creation	Reflect in learning	No direct bearing
Academic & Curriculum Issues				
Research	Spirit of enquiry	Enhanced learning practices	Unending pursuit	Constant effort
Ranking	Research orientation in curriculum	High standards	Necessity to update fast	Catch-up with time
Perception	Promote employability	Enhanced versatility	Places greater expectations	Not essential for all jobs
Utility	Integration of research in curriculum	Enriched curriculum	Limited scope	Clash with the course structure
Faculty Issues				
Research	Desire to acquire knowledge	Upgrade knowledge	Commitment	Motivation
Ranking	Enhances superiority	Become distinguished	Team work	Comparison
Perception	Academic opportunity	Forms of expression	Threat to idleness	Insecurity
Utility	Career development	Growth and fulfillment	True indicator	Instant rewards
Students Issues				
Research	Promotes Scientific temper	Enhances critical thinking	Inadequate pedagogy	Slow result
Ranking	Pride in institution	Identification	Improbability of goal attainment	Unhappiness
Perception	Preference for admission	Better performance	Chances of rejection	Diminished interest
Utility	Acceptability in society	Scope for employment	Limited employability skills	No job guarantee
Other Stakeholders Issues				
Research	Encourages research	Recognizes worthiness of institution	Absence of feedback	Misinformation
Ranking	Co-operation & support	Increased collaboration	Subjectivity	Lose support
Perception	Good image	Trust	Deficit information	Negative discrimination
Utility	Identify	Tap potentials	Unable to deliver	Dissatisfaction

	productive institutions	of the organization	expectations	

Table 2 : Advantages of ABC Model

Determinant issues	Affecting Factor	Critical Constituent Element
Organisational issues	Boost to research	Encouragement for innovation
		Expanding knowledge
	Reputation	Public acknowledgement
		Institutional Recognition
	Image	Consistency
		Eminence
	Efficiency	Competent faculty
		Translation into practice
Academic & Curriculum issues	Spirit of enquiry	Scientific temper
		Culture of learning
	Research orientation in curriculum	Improved curriculum
		Proper guidance
	Promote employability	Competitiveness
		Quality
	Integration of research in curriculum	Policy of curriculum planners
		Receptiveness of students
Faculty Issues	Desire to acquire knowledge	Personal differences
		Motivation
	Enhances superiority	Display competency
		Recognition
	Academic opportunity	Improved teaching
		More publication
	Career development	Faster growth in the organization
		New Openings
Student Issues	Promotes Scientific temper	Creativity
		Spirit of questioning
	Pride in institution	Belongingness
		Identification
	Preference for admission	First choice
		Best choice
	Acceptability in society	Being different
		Value addition
Other Stakeholders & Public Perception Issues	Encourages research	Take-up community issues
		Better solutions to problems
	Co-operation & support	Realization of importance
		Mutuality of interest
	Good image	Performance
		Satisfaction

	Identify productive institutions	Keeping quality
		Reaching benchmark

Table 3 : Benefits of ABC Model

Determinant issues	**Affecting Factor**	**Critical Constituent Element**
Organizational issues	More Publications	Encouragement
		Support
	Brand Building	Uniqueness
		Excellence
	Popularity	True acknowledgement
		Fair judgment
	Knowledge creation	Institutional commitment
		Faculty interest
Academic & Curriculum issues	Enhanced learning practices	Scope for innovation
		Sound learning
	High standards	Competitiveness
		Level of learning
	Enhanced versatility	Type of orientation
		Quality requirement
	Enriched curriculum	Respond to need
		Reflects new knowledge
Faculty Issues	Upgrade knowledge	Constant pursuit
		Scope for application
	Become distinguished	Proven knowledge
		Eminence
	Forms of expression	New platforms
		Self-actualization
	Growth and fulfillment	Better living
		Contentment
Student Issues	Enhances critical thinking	Conducive environment
		Constant encouragement
	Identification	Relate achievements
		Legacy
	Better performance	Quality students
		Coaching and mentoring
	Scope for employment	Level of ability
		Extent of training
Other Stakeholders & Public Perception Issues	Recognizes worthiness of institution	Makes first choice
		Consider dependable
	Increased collaboration	Interest for tie-up
		Joint ventures
	Trust	Willingness to associate

		Dependence
	Tap potentials of the organization	Identify avenues of co-operation
		Explore interest areas

Table 4: Constraints **of** ABC Model

Determinant issues	**Affecting Factor**	**Critical Constituent Element**
Organisational issues	Motivated Faculty	Number
		Availability
	Sustainability	Persistent effort
		Continued interest
	Bias	Critics
		Poor information flow
	Reflect in learning	Conscious effort
		Capacity of students
Academic & Curriculum issues	Unending pursuit	Retaining enthusiasm
		Strong desire
	Necessity to update fast	Changing times
		New knowledge
	Places greater expectations	Ability to perform
		Exaggeration of purpose
	Limited scope	Not fitting to requirement
		Student interest
Faculty Issues	Commitment	Overcoming time constraint
		Extra-effort
	Team work	Unity
		Common interest
	Threat to idleness	Creative
		Positive thinking
	True indicator	Consensus
		Agreed norms
Student Issues	Inadequate pedagogy	Teacher quality
		Teaching methods
	Improbability of goal attainment	Personal concerns
		Skepticism
	Chances of rejection	Student profile
		Short-listing
	Limited employability skills	Skill mismatch
		Skill deficiency
Other Stakeholders & Public Perception Issues	Absence of feedback	Limited interaction
		No established mechanism
	Subjectivity	Illusion
		On limitation

	Deficit information	Weak communication
		Poor public relations
	Unable to deliver expectations	Institutions priority
		Nature of requirement

Table 5: Disadvantages of ABC Model

Determinant issues	Affecting Factor	Critical Constituent Element
Organisational issues	Creating interest	Conservative mindset
		Resistance to change
	Competition with other institutions	Tradition and name
		Accept challenge
	Single parameter judgment	Overall progress ignored
		Lop sided focus
	No direct bearing	Organizational objective
		No quick returns
Academic & Curriculum issues	Constant effort	Time
		Attention
	Catch-up with time	Evolving curriculum
		Changing relevance
	Not essential for all jobs	Skill variation
		Job training
	Clash with the course structure	Wrong design
		Redundancy
Faculty Issues	Motivation	Internal factors
		External factors
	Comparison	Jealousy
		Vested interest
	Insecurity	Poor performance
		Challenge to existence
	Instant rewards	Pessimism
		Slow in materializing
Student Issues	Slow result	Inherent drawbacks
		Interest
	Unhappiness	Unrealized expectations
		Individual variation
	Diminished interest	Goal divergence
		Personal factors
	No job guarantee	Industry preference
		Test of ability
Other Stakeholders & Public Perception Issues	Misinformation	Roumour
		Limited interaction
	Lose support	Sustained performance

		Convincing stake holders
	Negative discrimination	Diversity of beneficiaries
		Propaganda
	Dissatisfaction	Extent of support
		Different Agenda

6. Conclusions:

From the above discussion and analysis, it is seen that the advantages and benefits stand out for the ABC model. It tries to create a research culture in the organisation. This learning environment in the organisation fosters innovation and creation of new knowledge in institutions. It fosters team work and encourages each individual to move up in the career ladder. All in all, we see that the organisation benefits along with the faculties and new knowledge are disseminated to the society. ABC model can be claimed as a measurable benchmark to growing organisations. It provides a sense of direction and growth to the organisation and the faculty in the organisation.

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