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A Study On Significance Of Globalization Of Higher Education In India Using Fuzzy Cognitive Maps

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Abstract

Globalization is the intensification of world-wide social relationships which link distant places in such a way that local happenings are shaped by events occurring many miles away and vice-versa. Well, the question: what exactly is globalization? is very easy to raise, but extremely difficult to answer. In this paper, however we propose to list and look at globalization impact on the higher education scenario, and some paradoxes generated thereof. Fuzzy Cognitive Map (FCM) is a powerful method which analyses the data by directed graphs and connection matrices. Now we use this method to study globalization impact on the higher education in India.

Keywords: Globalization, Higher education, Paradoxes, Fuzzy Cognitive Map.

Introduction:

In order to study the passenger transportation problem, matrix theory was developed by W.B.Vasantha Kandhasamy and V.Indira. We use the same matrix theory to study this problem. This paper has four sections. In the first section, we discuss the methods of applications of FCM connection matrix. In section two, we discuss the globalization impact on the higher education in India and some paradoxes generated thereof. The section three deals with the procedure, to find out the most common paradox in globalization impact on the higher education by using FCM connection matrix. In final section, we discuss conclusions based on our research paper.

1. Applications of FCM connection matrix:

An FCM is a directed graph with concepts as nodes and causalities as edges. It represents causal relationship between concepts. When the nodes of the FCM are fuzzy sets then they are called as fuzzy nodes. FCMs with edge weights or causalities from the set {–1, 0, 1} are called simple FCMs. Let $C_1, C_2, \ldots, C_n$ be the nodes of an

FCM. Suppose the directed graph is drawn using edge weight $e_{ij} \in \{0, 1, -1\}$. The matrix E is defined by $E = (e_{ij})$ where e_{ij} is the weight of the directed edge C_iC_j . E is called the adjacency matrix of the FCM, also known as the connection matrix of the FCM. Let C_1C_2 , C_2C_3 , C_3C_4 ,…, C_iC_j be the edges of the FCM ($i \neq j$). Then the edges form a directed cycle. An FCM is said to be cyclic if it possesses a directed cycle. An FCM is said to be acyclic if it does not possess any directed cycle. An FCM with cycles is said to have a feedback.

If $A = (a_1, a_2, \dots , a_n)$ where $a_i \in \{0, 1\}$, then A is called the instantaneous state vector and it denotes the on-off position of the node at an instant.

$a_i = 0$ if a_i is off and

$a_i = 1$ if a_i is on for $i = 1, 2, \dots, n$.

If the FCM settles down with a state vector repeating in the form

$A_1 \rightarrow A_2 \rightarrow \dots \rightarrow A_i \rightarrow A_1$ then this equilibrium is called a limit cycle.

$A = (a_1, \dots , a_n)$ is a vector which is passed into a dynamical system E.

Then $AE = (a'_1, \dots ,a'_n)$ after thresholding and updating the vector suppose we get $(b_1, \dots , b_n)$ we denote that by $(a'_1, a'_2, \dots , a'_n)$ $(b_1, b_2, \dots , b_n)$. Thus the symbol '$\rightarrow$' means the resultant vector has been thresholded and updated. The edges e_{ij} take values in the fuzzy causal interval [–1, 1]. $e_{ij} = 0$ indicates no causality,

$e_{ij} > 0$ indicates causal increase i.e. C_j increases as C_i increases (or C_j decreases as C_i decreases). $e_{ij} < 0$ indicates causal decrease or negative causality

i.e. C_j decreases as C_i increases (or C_j increases as C_i decreases). Simple FCMs have edge values in {–1, 0, 1}. Then if causality occurs, it occurs to a maximal positive or negative degree.

2. Globalization impact on Higher education and some paradoxes:

Today there are around 700 Universities/University-level institutions, 25,000 colleges including 2,500 women's colleges in India. The total enrolment of students in Universities and Colleges has been approximately 15 million, while the number of teachers is around 5.5 lakhs. The National Knowledge Commission (NKC) which came into existence on 2nd October,2006, recommended the establishment of 1500 Universities by 2015 so that a gross enrolment ratio of 15 percent may be achieved. The NKC discussed various issues under key heads such as Language, Translation, Libraries, Networks, Portals, Intellectual property Rights, Science and Technology, Research, Entrepreneurship, Right to Education etc…Needless to say that in almost all these areas, globalization does present innumerable opportunities and challenges. Some of the paradoxes that polarise the debate on the impact of globalization on Indian higher education are briefly stated below:

(a)Global vs Local:

What should be the perspective of an educational institution? Should it be traditional, conservative, remaining immune to the changes that are sweeping around the world? Or should it be receptive to the global academic culture? Or is there a middle way of 'glocalization' (a combination of the global and the local)? The academics while designing the curriculum are faced with this dilemma of catering to the interests of the

local community and to their needs and requirements, and at the same time of preparing the students to compete in the global arena.

(ii) Uniformity vs Autonomy:
The NKC rightly observed that "Higher Education in India is over-regulated and under-governed". In carrying out innovations in curriculum, selection of faculty and students, pedagogy and evaluation, planning the policies for the future, how much of autonomy do or should the institutions enjoy is another disturbing and dividing issue. Is control and regulation good for the academia? Or can it be self-regulative? Should the Institutions, including the Autonomous ones, in a University or in the State offer a uniform curriculum? How much of freedom is really good and desirable for the academic health of an institution are questions which do not have facile answers.

(iii) Higher Education: Public or Private?
The XI Five Year Plan envisages massive expansion of Higher Education: Setting up 30 Central Universities, 8 new IITs, 7 new IIMs, 10 National Institutes of Technology, and 20 Indian Institutes of Information Technology among others. Are these enough? Is privatization of education a necessary evil? What is the role of private education providers: the private aided, private unaided and self-financing institutions? It is in this context that globalization process throws up a challenge. Should there be a shift from centrally planned model to a market oriented model of higher education, or a combination of both? In some well known colleges abroad, an institution may offer courses which a 20 odd students demand for their next semester. We can not but allow investment from industries, organizations and institutions both from within and outside, but care and caution should go into all the terms and conditions.

(iv)Reservation vs Meritocracy:
This debate is perhaps the most acrimonious of all, and it is not likely to be resolved in the near future. Many colleges, especially the Minority institutions, are beacons of hope for many socially and religiously marginalized and discriminated groups for decades now. It is not an easy task to maintain the quality of the institution, raise resources, and compete with the self-financed institutions, especially in terms of infrastructure. These have been doing a fine balancing act between social justice and meritocracy. The US has been implementing the policy of Affirmative Action (AA) to strike the balance between the minorities and the elites.

(v)Link Language: English or Mother Tongue?
The medium of instruction is English in most of the premier institutions in our country. If it continues to be so, our students will be able to compete with the rest of their counterparts in the global arena. On the other hand, it also means that we are encouraging hegemony of English at the cost of other Indian languages. How do we remedy this problem peculiar to India, where only a miniscule minority has the opportunity to learn and compete in the medium of English, and where there are more than two score officially recognized languages?

(vi) Dissemination of information: unrestricted or controlled?
Accumulation and management of information is one of the most serious challenges faced today. How much of freedom to be given to the students in a College, be it through the working on the net or use of mobiles? How much time should a teacher devote to 'teaching' in a class as such, and to what extent the students be made to gather information by themselves? Is the use of technology as a teaching/learning aid inevitable in the classroom? In a globalised world, virtual class rooms, e-learning, CD-ROMs, powerpoints etc., would accelerate flow of information and also make teaching/learning more attractive. But at the same time it reduces the education process to simply input and output mechanical devise.

(vii) Internationalization of education: Boon or Bane?
Offering twinning programs in collaboration with overseas partners, or sending students abroad for a semester or two, or hiring experts/expertise from outside, has already been introduced many educational institutions, thus making education truly international. International exposure is desirable and even inevitable in these times. But what about those students who can not afford to 'buy' this kind of education?

(viii) Identity vs Hybridity:
Above all, globalization has a tendency to blur all identities. Just imagine, India and Australia bitterly fighting it out on the cricket field, and the very next week Dhoni and Hayden playing together for the Chennai Supper Kings, and crowd lustily cheering them. Educational institutions also face the dilemma of keeping their essential nature intact, and at the same time allowing other influences to flow in.
Now we discuss this problem using FCM connection matrix method

3.Description Of The Problem:

The main aim of this paper is to list and look at globalization impact on the higher education scenario, and some paradoxes generated thereof and then finding the most common paradox in globalization impact on the higher education by using FCM connection matrix. The eight paradoxes that are listed above are taken as nodes. i.e.,
C_1 – Global vs Local
C_2 – Uniformity vs Autonomy
C_3 – Higher Education : Public (or) Private?
C_4 – Reservation vs Meritocracy
C_5 – Link Language : English or Mother Tongue?
C_6 – Dissemination of information: Unrestricted or Controlled?
C_7 – Internationalization of Education: Boon or Bane?
C_8 – Identity vs Hybridity
C_9– Globalization impact on Higher Education in India

The directed graph is drawn by taking these paradoxes C_1, C_2, …, C_9 as nodes depicted inside the circles and the causalities among these nodes are denoted by the edges which is shown in the Figure

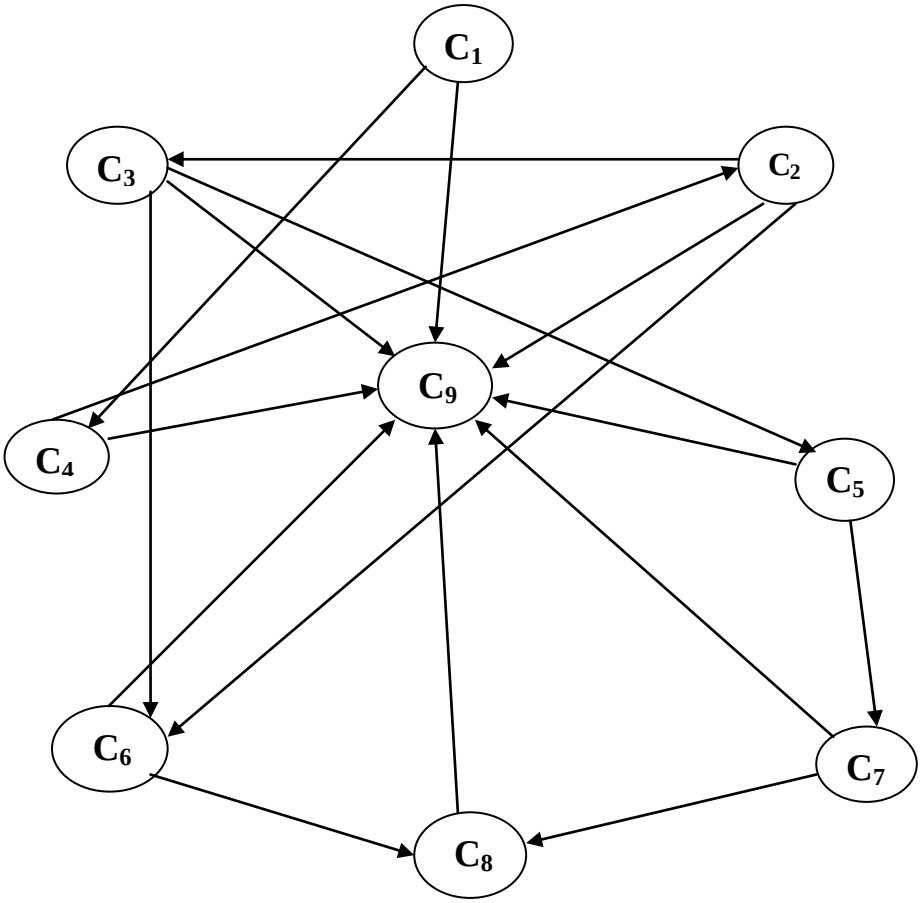

Figure: Directed graph.

The corresponding FCM connection matrix is represented by E

$$E = \begin{pmatrix} 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$$

Consider the first node $C_1 = 1$. We hold C_1 on the temporal associative memories recall process. Threshold signal functions synchronously update each concept after

each pass, through the connection matrix E.
We start with the Global vs Local $A_1 = (1\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0)$. The arrow indicates the threshold operation.
Now $A_1 = (\ 1\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ )$
$A_1E = (\ 0\ 0\ 0\ 1\ 0\ 0\ 0\ 0\ 1\ ) \rightarrow (\ 1\ 0\ 0\ 1\ 0\ 0\ 0\ 0\ 1\ ) = A_2$
$A_2E = (\ 0\ 1\ 0\ 1\ 0\ 0\ 0\ 0\ 2\ ) \rightarrow (\ 1\ 1\ 0\ 1\ 0\ 0\ 0\ 0\ 1\ ) = A_3$
$A_3E = (\ 0\ 1\ 1\ 1\ 0\ 1\ 0\ 0\ 3\ ) \rightarrow (\ 1\ 1\ 1\ 1\ 0\ 1\ 0\ 0\ 1\ ) = A_4$
$A_4E = (\ 0\ 1\ 1\ 1\ 1\ 2\ 0\ 1\ 5\ ) \rightarrow (\ 1\ 1\ 1\ 1\ 1\ 1\ 0\ 1\ 1\ ) = A_5$
$A_5E = (\ 0\ 1\ 1\ 1\ 1\ 2\ 1\ 1\ 7\ ) \rightarrow (\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ ) = A_6$
$A_6E = (\ 0\ 1\ 1\ 1\ 1\ 2\ 1\ 2\ 8\ ) \rightarrow (\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ 1\ ) = A_7 = A_6$

Since (1 1 1 1 1 1 1 1 1) is a limit cycle, we see that Global vs Local paradox influences all other sectors.

4.Conclusion:

Here we give the conclusions based on the work which is discussed above. From the discussed fuzzy matrix, when we switch on the Global vs Local paradox node, it automatically influences all other nodes to switch on. Therefore Global vs Local paradox is the most common paradox in globalization impact on the higher education connection. It is now established that the Global and the local perspectives are impinging on each other! No educational institution can remain insular from the winds of globalization. It is time every educational institution responded to the challenges and paradoxes of globalization and meaningfully, without compromising their ethos and character, channelize the benefit, in order to make the institution stronger and more successful!

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