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Study on Impact of Media on Education Using Fuzzy Relational Maps

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Abstract- In this paper we bring out the depth of impact of media upon the growth of education. Education moulds an individual to take firm decisions on issues. It makes to feel independent and leads to a more exposed world. Media is a very powerful tool to explore the world and have access to the world. Internet, Mobile phones, etc., helps for an easy access to any part of the world at our finger tips. Media may lead us to both constructive and destructive mechanism depending the way we deal with it.Here we use FRM model to study and analyze the impact of media on education.

Fuzzy Relational Maps (FRM),Media, Education.

I. SECTION ONE: FUZZY RELATIONAL MAPS (FRMS)

The new notion called Fuzzy Relational Maps (FRMs) was introduced by Dr. W.B.Vasantha and Yasmin Sultana in the year 2000. In FRMs we divide the very casual associations into two disjoint units, like for example the relation between a teacher and a student or relation; between an employee and an employer or a relation; between the parent and the child in the case of school dropouts and so on. In these situations we see that we can bring out the casual relations existing between an employee and employer or parent and child and so on. Thus for us to define a FRM we need a domain space and a range space which are disjoint in the sense of concepts. We further assume no intermediate relations exist within the domain and the range space. The number of elements in the range space need not in general be equal to the number of elements in the domain space.In our discussion the elements of the domain space are taken from the real vector space of dimension n and that of the range space are real vectors from the vector space of dimension m (m in general need not be equal to n). We denote by R the set of nodes $R_1, \ldots, R_m$ of the range space, where $R_i = \{(x_1, x_2, \ldots, x_m) / x_j = 0 \text{ or } 1\}$ for i = 1, … ,m. If $x_i = 1$ it means that the node R_i is in the ON state and if $x_i = 0$ it means that the node R_i is in the OFF state.

Similarly D denotes the nodes $D_1,\ldots,D_n$ of the domain space where $D_i = \{(x_1,\ldots, x_n) / x_j= 0 \text{ or } 1\}$ for i = 1, …, n. If $x_i = 1$, it means that the node D_i is in the on state and if $x_i = 0$ it means that the node D_i is in the off state.A FRM is a directed graph or a map from D to R with concepts like policies or events etc. as nodes and causalities as edges. It represents casual relations between spaces D and R. Let D_i and R_j denote the two nodes of an FRM. The directed edge from D to R denotes the casuality of D on R , called relations. Every edge in the FRM is weighted with a number in the set {0, 1}.Let e_{ij} be the weight of the edge D_iR_j,$e_{ij} \in \{0.1\}$. The weight of the edge D_iR_j is positive if increase in D_i implies increase in R_j or decrease in D_i implies decrease in R_j. i.e. casuality of D_i on R_j is 1. If $e_{ij} = 0$ then D_i does not have any effect on R_j. We do not discuss the cases when increase in D_i implies decrease in R_j or decrease in D_i implies increase in R_j.When the nodes of the FRM are fuzzy sets, then they are called fuzzy nodes, FRMs with edge weights {0, 1) are called simple FRMs.Let $D_1, \ldots,D_n$ be the nodes of the domain space D of an FRM and $R_1, \ldots, R_m$ be the nodes of the range space R of an FRM.Let the matrix E be defined as $E = (e_{ij})$ where $e_{ij} \in \{0, 1\}$; is the weight of the directed edge D_iR_j (or R_jD_i), E is called the relational matrix of the FRM.It is pertinent to mention here that unlike the FCMs, the FRMs can be a rectangular matrix; with rows corresponding to the domain space and columns corresponding to the range space. This is one of the marked difference between FRMs and FCMs.

Let $D_1, \ldots,D_n$ and $R_1,\ldots,R_m$ be the nodes of an FRM. Let D_iR_j (or R_jD_i) be the edges of an FRM, j = 1, …, m, i = 1, …, n. The edges form a directed cycle if it possesses a directed cycle. An FRM is said to be acycle if it does not posses any directed cycle.An FRM with cycles is said to have a feed back when there is a feed back in the FRM, i.e. when the casual relations flow through a cycle in a revolutionary manner the FRM is called a dynamical system.Let D_iR_j(orR_jD_i), $1 \le j \le m$, $1 \le i \le n$. When R_j(or D_i) is switched on and if casuality flows through edges of the cycle and if it again causes $R_i(D_j)$, we say that the dynamical system goes round and round. This is true for any node R_i (or D_j) for $1 \le i \le m$, (or $1 \le j \le n$). The equilibrium state of this dynamical system is called the hidden pattern. If the equilibrium state of the dynamical system is a unique state vector, then it is called a fixed point. Consider an FRM with $R_1, \ldots, R_m$ and $D_1, \ldots, D_n$ as nodes. For example let us start the dynamical system by switching on R_1 or D_1. Let us assume that the FRM settles down with R_1 and R_m(or D_1 and D_n) on i.e. the state vector remains as (10…01) in R [or (10…01) in D], this state vector is called the fixed point.If the FRM settles down with a state vector repeating in the form $A_1 \to A_2 \to \ldots \to A_i \to A_1$ or ($B_1 \to B_2 \to \ldots \to B_i \to B_1$) then this equilibrium is called a limit cycle.

A. Methods of determination of hidden pattern.

Let $R_1, \ldots, R_m$ and $D_1, \ldots, D_n$ be the nodes of a FRM with feed back. Let E be the $n \times m$ relational matrix. Let us find a hidden pattern when D_1 is switched on i.e. when an input is given as vector A_1= (1000...0) in D the data should pass through the relational matrix E. This is done by multiplying A_1 with the relational matrix E. Let $A_1E = (r_1, \ldots ,r_m)$ after thresholding and updating the resultant vector (say B) belongs to R. Now we pass on B into E^T and obtain BE^T. After thresholding and updating BE^T we see the resultant vector say A_2 belongs to D.

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This procedure is repeated till we get a limit cycle or a fixed point.

II. SECTION TWO: DESCRIPTION OF THE PROBLEM

Education civilizes a society. Teachers mould the student's community to be better part takers of our society. Teachers impart knowledge to the students for their own betterment and the society at large. Students of different backgrounds are place under one roof known as class room, A teachers has to be so prudent that he/she reaches the students of different caliber. A small mess up in this regard may ruin the future of the student and the on the whole the society. Hence to study and analyze this problem we have constructed a linguistic questionnaire and using this linguistic questionnaire we have interviewed 50 persons. This linguistic questionnaire was used to obtain the attributes and using these attributes and the opinion of the experts we have used FRM to analyze the problem.

III. SECTION THREE: FRM MODEL TO STUDY ABOUT THE IMPACT OF MEDIA ON EDUCATION

Now using the linguistic questionnaire and the expert's opinion following attributes associated by impact of mediaon education is listed. Thus the types of media are taken as the domain space and the types of education as the range space of the FRM. In choosing the attributes there is no hard and fast rule. It is left to the choice of any researcher to include or exclude any of the attributes.

Attributes Related to the Domain space M given by M = $\{M_{1,} \ldots, M_5\}$

M_1 - Magazines
M_2 - Films and movies
M_3 - News papers
M_4 - Television
M_5 - Internet

Attributes Related to the Range space Y given by Y = $\{Y_{1,} \ldots, Y_7\}$

Y_1 - Nursery
Y_2 - Elementary
Y_3 - technical
Y_4 - Special(mentally& physically challenged)
Y_5 - Collegiate
Y_6 - Secondary
Y_7 - Adult.

Now using the expert's opinion who is a media person we have the following relation matrix. We have M_1.M_2, M_3,M_4,M_5 as the rows and $Y_1$2,Y_2,Y_3,Y_4,Y_5,Y_6,Y_7 are the columns.

$$A_1 = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 1 & 0 & 0 \end{bmatrix}.$$

The hidden pattern of the state vector X = (0 1 0 0 0) is obtained by the following method:

XA_1 ↪(0 1 0 0 0 0 0) = Y
YA_1^T ↪(0 1 0 1 0) = X_1
X_1A_1 ↪(0 1 0 0 1 0 0) = Y_1
$Y_1A_1^T$ ↪(0 1 0 1 1) = X_2
X_2A_1 ↪(1 1 0 0 1 0 0) = Y_2
$Y_2A_1^T$ ↪(0 1 0 1 1) = X_3 (say)
X_3A_1 ↪(1 1 0 0 1 0 0) = Y_3 (say)

(Where ↪ denotes the resultant vector after thresholding and updating) When we take M_2 in the ON state (i.e. films /movies) and all other attributes to be in the off state.
We see the effect of X on the dynamical system A_1 is a fixed point given by the binary pair {(0 1 0 1 1), (1 1 0 0 1 0 0)}. When we take flims/movies node alone in the on state we get say X = (0 1 0 0 0)

The resultant to be the fixed point given by the binary pair {(0 1 0 1 1), (1 1 0 0 1 0 0)}. When the on state is taken as node M_2 we see the hidden pattern is the fixed point which is the same binary pair, which makes the nodes $M_4$and $M_5$to be in the on state in the domain space and makes the nodes Y_1, Y_2 and Y_5 of the range space to be in the on state.Since the working is time consuming, a C program is formulated for finding the hidden pattern. The casual connection matrix A_2 is given by the second expert who is a professor.Let M_1.M_2, M_3,M_4,M_5 taken along the rows and Y_1,Y_2,Y_3,Y_4,Y_5,Y_6,Y_7 along the columns.

$$A_2 = \begin{bmatrix} 0 & 1 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 & 1 & 0 & 0 \end{bmatrix}$$

Suppose the state vector X = (0 0 0 1 0) ie., the node internet is in the on state condition and all other nodes are in the off state. We see the resultant binary pair using the C - program is given by {(1 0 0 1 0), (0 1 0 0 0 1 0)} which is the fixed point.When we take the state vector X_1 = (0 0 0 1 0) ie., the node television i.e., M_4 in the on state and all other attributes be in the off state we see the effect of X_1 on the dynamical system A_2 is a fixed point given by the binary pair {(1 0 0 1 0), (0 1 0 0 0 1 0)} .The interpretation of the hidden pattern of several state vectors using several experts is used in this paper to arrive at the conclusion. To show the mode of working we have just given two experts opinion.

IV. SECTION FOUR: CONCLUSIONS AND SUGGESTIONS

Students should be trained to use the technology to have better understanding.Internet is a very powerful tool which has all the information required, the young minds should to motivate in right sense to make use of it rather than accusing young ones for using internet**.**Usage of camera mobile phone and its feature has to be meticulously and carefully dealt with.Education and media should go in hand in hand for the betterment of an individual and the society at large.Computers knowledge

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should be thought to children to bring out their talent and creativity**.**

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