

Study of Problems Faced by Rural Adolescent School Going Children With Disabilities – A Fuzzy Analysis

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Abstract

In this paper we study the problems faced by school going disabled rural children. Everyday problem of them include starting from home to reaching the school on time, problems in class room, ill treatment by their classmates and teachers, the support they get from their parents and other personal problems. These are analysed using Fuzzy Cognitive Maps (FCMs) model. A pilot survey of 25 rural students studying in 8th to 10th standard is used in this analysis.

Key words: Fuzzy Cognitive Maps (FCMs) model, Initial state vector, Thresholding, Hidden pattern, Fixed point, Limit cycle.

1. Introduction

Fuzzy Cognitive Maps (FCMs), which was introduced by Bart Kosko in the year 1986. FCMs have a major role to play mainly when the data concerned is an unsupervised one. This fuzzy technique alone gives the hidden pattern of the situation apart from the Fuzzy Relational Maps model. For more about FCMs refer^{1,3-5}.

This paper has 3 sections. Section one is introductory in nature. Section two describes the problem and uses the FCM model to analyse the problem. Section three give the suggestion and conclusion based not only on this FCMs

model but also from the several other such FCMs used in this study together with the discussion made during this study with experts.

2. Description of the problem and use of FCMs to study the problem :

In this section we briefly describe the problems of the rural school going disabled children. We also describe the attributes related with the problem in a line or two. Finally justification for using this FCMs model is given.

The rural adolescent school going children face a lot of problems which cannot be described using statistical methods but only involves

emotions. In this paper we study the problems faced by school going rural children.

Based on an expert's opinion certain attributes like their feeling of desperateness due to disability, parental extra care, social stigma, ill-treatment by class mates, ill-treatment by teachers, parent's desperateness, feeling of comfort, and encouragement from students teachers have been chosen. Since all these attributes can not be measured and the data is an unsupervised one we are at the outset justified in using fuzzy models in general and FCMs models in particular. These have been analysed using Fuzzy Cognitive Maps (FCMs) and conclusions have been arrived.

Fuzzy Cognitive Maps (FCMs) are more applicable when the data is an unsupervised one and involves more of feelings that is psychological in nature related to mind hence we are justified in using this fuzzy model.

Attributes related with the problem are described in a line of two in the following:

D_1 : A feeling of desperateness due to the disability : A disabled person cannot lead a normal life like other members of the society. He/She has to depend on others for meeting his/her basic needs. Because of this he/she has to face shyness, anger, neglect and ill-treatment of others, all these makes them feel desperate.

D_2 : Parents extra care is needed at every stage: Normally they care for their children. But if the child is a handicapped one, they require to be more careful. As such child is open to ill treatment by others at school and play area, the parent's extra care is needed at every

stage.

D_3 : Social stigma – stinging comments : The traditional Indian society is largely impervious to the feelings of those who are at the lower rung of the society. The condition of disabled persons is no exception to this. Hence the social stigma regarding disabled persons and stinging comments about them continue to be there in the social arena. The Government is trying to change this situation through reservations and other favours to disabled people.

D_4 : Ill-treatment by classmates : The single major handicap to the disabled is the ill-treatment meted out to them by their classmates at school. Being grown up in a graded society and not being mature enough to be soft towards the feelings of disabled associates, the students at their adolescent age specially living in rural area cause great damage to their unfortunate classmates through their inhuman attitude.

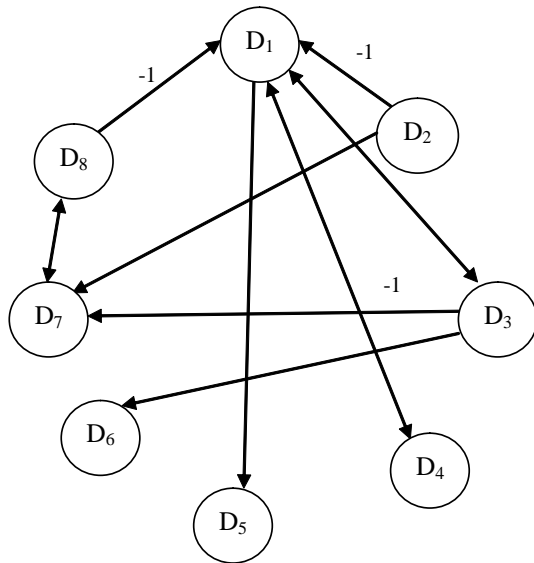
D_5 : Teachers ill-treatment : The Indian education system is largely teacher oriented and not student centric. Even the slow learners are not properly attended to. In such a situation, where is the time for the teacher to offer a special and humane treatment to the disabled. To make it worse, some teachers are prone to ill-treat the disabled due to their work pressure.

D_6 : Desperate Parents resulting in ill-treatment : Due to the inability of the parents to tackle the situation arising out of the ill-treatment of their disabled rural children by classmates, teachers and society, the parents becomes desperate. In turn, they may begin to ill-treat their disabled children and stop them from studies that is going to school.

D_7 : Feeling of comfort : A feeling of comfort is absolutely necessary for the disabled rural students to develop their skills and abilities to help them live as honourable citizens in the society. It is the duty of the society to create such a congenial atmosphere to develop a feeling of comfort in the minds of the disabled.

D_8 : Class mates/ teachers encouragement : The family will naturally be all sympathetic and helpful towards the disabled member. The Government has announced various ways and means to improve their lot. In this situation, it is the duty of the classmates and teachers of the disabled to encourage them to come up and live as normal and equal citizens.

The direct graph using the above said eight attributes given by an expert who is a socio scientist working for the PWDs is as follows.



Connection matrix M_1 of the directed graph which forms the dynamical system of the model is as follows.

$$M_1 = \begin{pmatrix} 0 & 0 & 1 & 1 & 1 & 0 & 0 & 0 \\ -1 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 & 0 & 1 & -1 & 0 \\ 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ -1 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \end{pmatrix}.$$

Here $D_1 = (1\ 0\ 0\ 0\ 0\ 0\ 0\ 0)$, $D_2 = (0\ 1\ 0\ 0\ 0\ 0\ 0\ 0)$, $D_3 = (0\ 0\ 1\ 0\ 0\ 0\ 0\ 0)$, $D_4 = (0\ 0\ 0\ 1\ 0\ 0\ 0\ 0)$, $D_5 = (0\ 0\ 0\ 0\ 1\ 0\ 0\ 0)$, $D_6 = (0\ 0\ 0\ 0\ 0\ 1\ 0\ 0)$, $D_7 = (0\ 0\ 0\ 0\ 0\ 0\ 1\ 0)$, $D_8 = (0\ 0\ 0\ 0\ 0\ 0\ 0\ 1)$ be the initial state vectors in which each D_i is in the on state; $1 \leq i \leq 8$.

Suppose the expert wishes to work with the on state of the node D_2 . Let $D_2 = (0\ 1\ 0\ 0\ 0\ 0\ 0\ 0)$ that is the attribute, “Parents take extra care at every stage” alone is in the on state. We find the effect of D_2 on the dynamical system M_1 .

$$\begin{aligned} D_2 M_1 &\rightarrow (0\ 1\ 0\ 0\ 0\ 0\ 1\ 0) = X_1 \text{ (say)} \\ X_1 M_1 &\rightarrow (0\ 1\ 0\ 0\ 0\ 0\ 1\ 1) = X_2 \text{ (say)} \\ X_2 M_1 &\rightarrow (0\ 1\ 0\ 0\ 0\ 0\ 1\ 1) = X_3 (= X_2 \text{ say}). \end{aligned}$$

Thus the hidden pattern of the initial state vector D_2 is a fixed point. All negative attribute nodes are in the off state except the positive attribute nodes, these children feel comforted D_7 and classmates and teachers encourage them alone come to the on state. Likewise we have worked with each and every attribute and the resultants are listed in the

following:

$$M_1 D_1 = (1 0 1 1 1 1 0 0),$$

$$M_1 D_2 = (0 1 0 0 0 0 1 1),$$

$$M_1 D_3 = (1 0 1 1 1 1 0 0),$$

$$M_1 D_4 = (1 0 1 1 1 1 0 0),$$

$$M_1 D_5 = (0 0 0 0 1 0 0 0),$$

$$M_1 D_6 = (0 0 0 0 0 1 0 0),$$

$$M_1 D_7 = (0 0 0 0 0 0 1 1)$$

$$\text{and } M_1 D_8 = (0 0 0 0 0 0 1 1)$$

The most influential nodes of the dynamical system are D_1 , D_3 and D_4 for all of them have made four other nodes to on state. Clearly when the node D_1 alone is in the on state all the nodes come to on state except D_2 , D_7 and D_8 which is in keeping with the fact that when the feeling of desperateness due to disability is on parents, they do not take extra care of their children. They do not enjoy a feeling of comfort and they do not get the classmate/teachers encouragement.

However the nodes which comes to on state are D_3 , D_4 , D_5 and D_6 . The on state of D_1 makes on social stigma D_3 - ill treatment by classmates is on D_4 , D_5 teachers too ill treat them and they do not have a feeling of comfort and class mates / teachers do not encourage them comes to on state. However we have worked with several other experts using FCM model and using the same set of eight attributes, the results of them are included in the section on conclusions.

3. Conclusion

Based in the analysis of the Fuzzy

Cognitive Map model using the attributes suggested by the expert, we come to the conclusion that a feeling of desperateness due to the disability leads to social stigma and ill-treatment from teachers and classmates. This in turn leads to desperation in parents. However extra care from parents and encouragement from classmates and teachers may bring a feeling of comfort in the hearts of differently abled school going rural children.

From the interviews held with the parents and children it was clear that usually most of the class mates of the disabled children, mock or make fun of the disability suffered by that child. Further it was found from discussions some of the parents were indifferent about their disable children's education. Most of the disabled children who continued their studies was solely due to their own interest and most of the parents were not that supportive to educate them. It was observed that this lead to more school dropouts from the disabled category.

It is important to record this study pertains to rural poor school going disabled children. Further it was observed that there were rural poor disabled children who have not entered the school premises. So it is suggested government takes steps to educate the rural public to be kind and considerate with these disabled children. Constant and repetitive television shows can make the rural public handle the disabled children with compassion. Finally from each and every expert the resultant vectors using the FCMs model clearly showed that the on state of a positive attribute invariably made on, all the other positive attributes. Likewise the negative attributes made on mostly the negative attributes.

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