

# **SOCIOMETRIC RELATIONSHIPS BETWEEN STUDENTS - AN INTRODUCTION TO THE CREATION OF BEHAVIOR MODEL BASED ON FUZZY LOGIC**

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## **Abstract**

The article describes the sociometric relationships which will be the bases for building a single student object model. Experiment based sociograms were presented and further research steps were proposed.

***Keywords:** sociometric relationships, student model, object model.*

## **Introduction**

The problem of selecting an appropriate method of teaching concerns many teachers. Pedagogy theorists have developed several theories on conducting the teaching process based on experience and groups of students observation. However, a coherent perspective of the student - teacher and student - student relationships is needed, which would have an impact on the atmosphere in the classroom, teachers' working efficiency and learning outcomes.

In the available literature [1], the democratic approach to the students in the class was enjoined, justifying the improved results achieved by the whole class. The observations of the author, engaged in teaching for several years, led to different conclusions. A classroom environment is the environment more complex and needs to be explained. This community demanding to look not only from the pedagogical but also from the other sciences perspective. Thus, made observations may represent an important step forward in the study of the behavior of the groups of people, crowd psychology, etc.

In his research on pedagogy, the author of the paper has not found the model the behavior of student groups based on object-oriented approach known in the computer science. In the proposed model, the student has certain characteristics (attributes) and he behaves specifically (methods). As the object, he interacts with other objects (students, teachers) to create a specific system (school environment). The detection of the object attributes, the methods and combining them with fuzzy logic will not only create a model class, but it can also allow to predict individual pupils' behavior before the teacher will begin the teaching process.

If such a model was created, a teacher would get a powerful teaching tool which could help him to choose not only the methodology of teaching but also the style of the teacher's work optimal for the class right before the teaching process beginning.

The scope of research includes the following topics:

1. literature studies,
2. conducting the sociometric tests for at least three groups of students,
3. optionally conducting the psychometric tests,
4. development of auxiliary tests,
5. conducting the auxiliary tests,

6. the creation of a single student model with fuzzy attributes (the student as an object),
7. verification of the student model,
8. "learning outcomes" group of objects simulation,
9. carrying out the verification experiment.

The purpose of this experiment was to discover relations prevailing in a social group and to check the students ability to discover the attributes that these relationships create.

### Experiment

Twenty-one students from the 1st grade of vocational school (16 -17 year olds) participated in the experiment. After a three-month period of being together in the school environment, students completed a questionnaire prepared with the Moreno methodology and presented in Molak's [2] work. Polls concerned two sets of issues: cooperation and trust. The results are shown on a simplified disordered sociograms (due to clarity).

In the study, the group was abandoned by students marked as numbers 7, 8, 9. This happened in the first month of research, still in the process of setting up relationships between students, so their impact on the group can be considered negligible. These students were not surveyed.

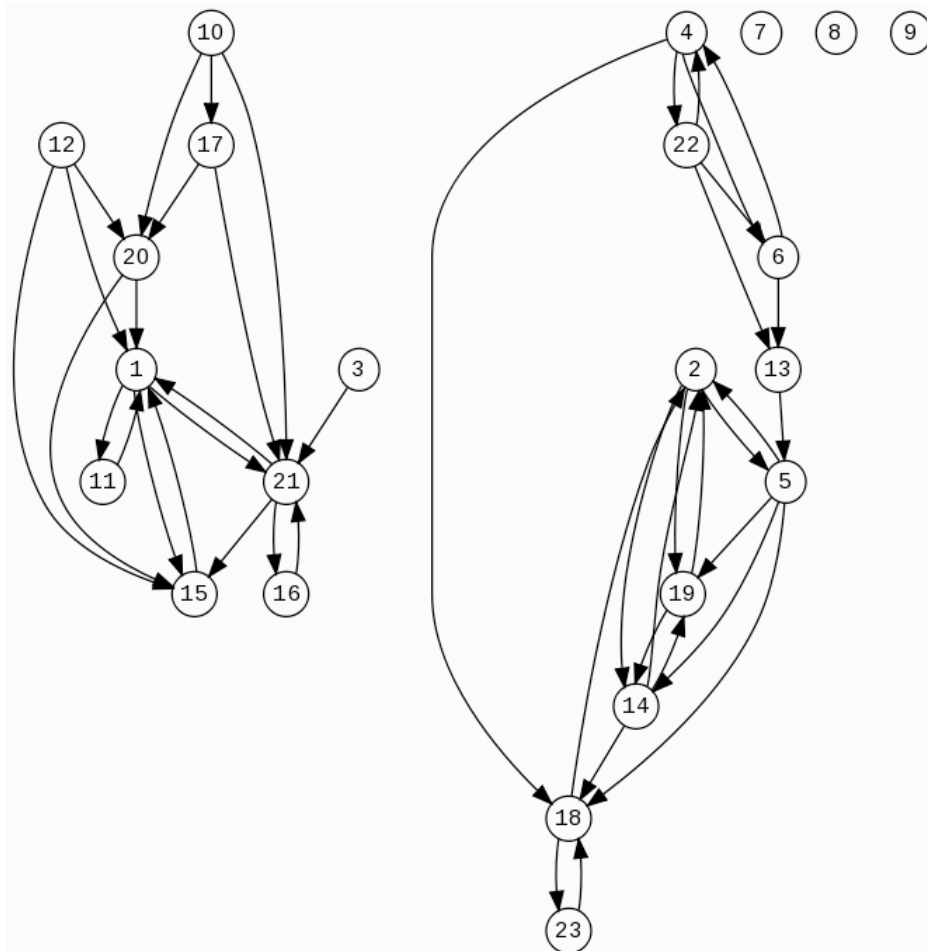


Figure 1. Sociometric situation "Who would you most do a presentation with and why?"

## Results and discussion

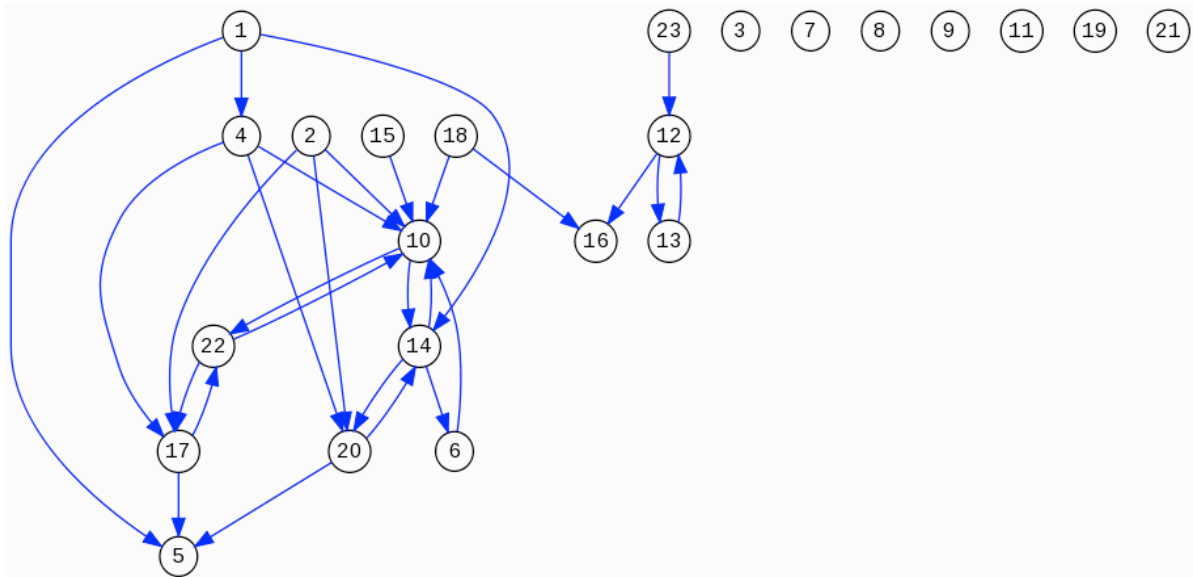
Figure 1 shows the sociogram corresponding to the sociometric situation "Who would you most do a presentation with and why?". The striking fact is the class divides itself into two groups with sociometric stars 1, 15, 21 in one group and 2 of 18 in the second group. The centers of the groups are exemplified by the packs of students 1, 15, 21 and 2, 5, 14, 18, 19 which are joined with other students.

Figure 2 shows sociograms presenting dislikes during the work process ("Who is least likely to do a presentation with and why?"). An indisputable fact is the alienation of student 10, described in polls as strange and antisocial, and indication by a group students 5, 14, 17 and 20 as the ones that could not co-operate.

In terms of trust ("Who would you confide your secret to and why?", Figure 3) there are no obvious sociometric stars (14 - three indications), students are grouped into pairs: 10 – 17, 4 – 22, 5 – 14, or form short sociometric chains such as 20 – 12 – 3 – 15 – 1.

In terms of the lack of trust ("Who would you not confide your secret to and why?", Figure 4) group does not trust students numbered 22 and 23, then 5 and 14.

Existing relationships in the classroom were discovered based on the research. In both studies, an open conflict between students 12 and 13 draws attention to, and a clear division of classes into two separate blocks is perceived. A neutral insulation of the student 11 is also noticeable. Students do not significantly consider sociometric situation, which shows the social immaturity of classes.



**Figure 2.** Sociometric situation "Who is least likely to do a presentation with and why?"

The surveys presented to students included a request for justification of their choice (part of poll starting with "why?"). The intentions of the experiment justification for the choice would be the starting point to detect the characteristics of a student on the basis of which likes and dislikes among students are being formed. A further step would be to create a single student object model, containing attributes corresponding to the characteristics of the student. Justification for the choice, however, was reported only by a few students; the others could not or did not want it to perform. Additional interviews resulted in statements like "I like him", " he seems cool" or "I do



## **Acknowledgements**

This paper was supported by the internal grant SGS15/PřF/2015, called *Fuzzy modeling tools for adaptive search burdened with indeterminacy and system behavior prediction*, at Department of Informatics and Computers, University of Ostrava..

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