STUDENT PROFESSIONAL ORIENTATION USING FUZZY LOGIC RULES AND QUALITY

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SUMMARY

Quality is an elusive characteristic. The word "quality" can be defined and described in various ways. However, to improve and assure the quality of the organization, it is important to understand, identify and measure quality. In the context of technical education, striving for technical quality is not a new strategy. One of the most important problems is to choose of branch for appropriate to their abilities. Generally, determining these abilities is so complex process. Not managing this process completely or managing it badly causes some hardships in student's life and in consequence of their educational life. The standard test methods which are being used to determine the student's abilities have a number of disadvantages. While directing the students to their careers, fuzzy logic rules considering several input parameters are used in this study. For this aim, a graphical user interface programme working with fuzzy logic rules was designed and its results are more effective and efficient.

Keywords: Professional orientation, fuzzy logic, quality

1. INTRODUCTION

Education is one of the most important stages of human life. Receiving appropriate training in accordance with persons' ability or interest makes person more successfully in their lives. So, the professional orientation has a great importance to train successful individuals in the society. Determining individuals' ability is too hard and complex process. In the process of classic methods: Student advisor advisers and classroom teachers use some tests to identify the students' professional aptitude. Having too much questions, these tests bring some drawbacks such as students feel bored while answering questions and also, they answer randomly [1-2].

In Germany, the last three years of compulsory education takes place in the form of school and vocational training. In this country, guiding students in according to their abilities and interests is at the end of the fourth year. Up to this time, students' marks and courses in which they are successful and unsuccessful are reported by teachers. It is given some advices by interviewing students' family. Control is continued in the next two years after the selection the students decision is checked, whether it is right or not. Students' integration to school and their success are reported by observing them [3].

In England, it is applied an intelligence test, writing composition with English and info-test to the last-year-students in primary school. With the help of the test results and teachers' reports the governor is advised by the local school administrators [3].

In France, vocational guidance is like this: Secondary education takes 7 years in France. The first four years is compulsory. Students who are unsuccessful in this period are directed proper professions after a short vocational training. There are institutions including private sectors in it conducts the guidance together with the ministry [3].

In this study; definition of students' professional competence is evaluated with the help of the program designed with fuzzy logic rules. Besides, additional parameters (student advisor adviser's thoughts, grade point average of previous training, determining test of professional desire, students' thoughts, physical conditions and parents' thoughts) are transferred to the system and used to make up with the consequences to cut down the above-mentioned drawbacks.

2. QUALITY

Recently quality is considerable effective factor in all field and all countries to be a concern of the highest political priority. Nearly all sectors are interested in quality in education. The quality plays an important role in both the management of the lectures and the education on instrumentation and measurement. The future of all countries and the world depends on high school and college students receiving the best instruction. High levels of knowledge, competencies and skills are considered to be the very basic conditions for active citizenship, employment and social cohesion. Lifelong learning is an important means of shaping one's future on a professional and personal level, and high-quality education is essential in the light of labors market policies, and the free movement of workers within the European Union [4].

3. FUZZY LOGIC

Applications and varieties of Fuzzy logic put forth by Prof. Lotfi A.Zadeh hailing from Azerbaijan and member of University of California in Berkeley have been increasing day by day. Fuzzy logic which is like binary logic; many assets not certain 2 assets, ambiguities are conveyed mathematically. In fact, implications that people use in their daily lives are fuzzy logic control. Fuzzy logic basis is based on fuzzy sets and subsets. In classic approach, a substance is either the element of the set or not [5-7].

In this case, set membership in terms of mathematical relations as the elements of the "1", is not "0" value received. Fuzzy logic approach to the existence of each asset in the cluster membership degree is between $[0,1]$ and $\mu(x)$ and is shown. Values close to 1, about the cluster membership of the object, the appropriate set of values close to 0 is not a member. Generally using the membership functions: piece-wise linear functions, the Gaussian distribution function, the sigmoid curve, quadratic and cubic polynomial curves (See Fig. 1).

The operations in Fuzzy system are given in the Figure 2. Here:
- Fuzzification: Using fuzzy expressions in the whole premise of input variables vary between 0 and 1 to determine the membership degrees.
- Rule evaluation: Using fuzzy logic operations to determine the rules of weight
- Defuzzification: Converted into a single total number of fuzzy sets to the case of the results [5-7]
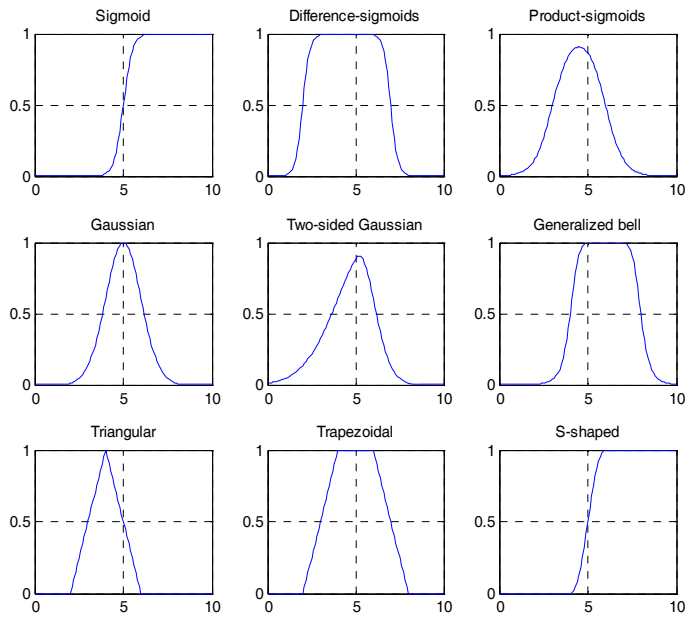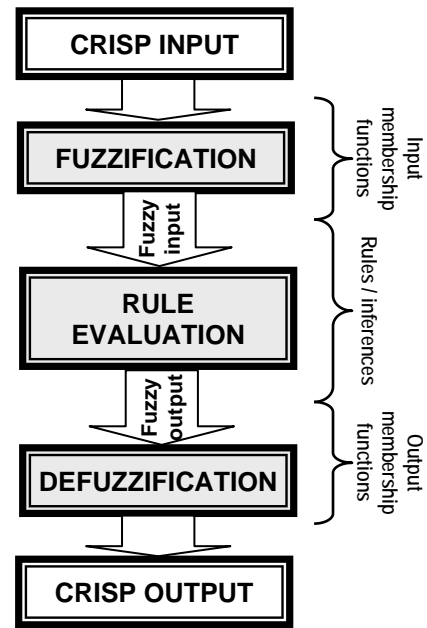
Figure 1. Same membership functions

Figure 2. Operation of fuzzy system

4. STUDENT PROFESSIONEL ORIENTATION BASED ON FUZZY LOGIC

The system's block diagram which is designed for defining to professional desires in accordance with fuzzy logic based is given in Fig. 3.

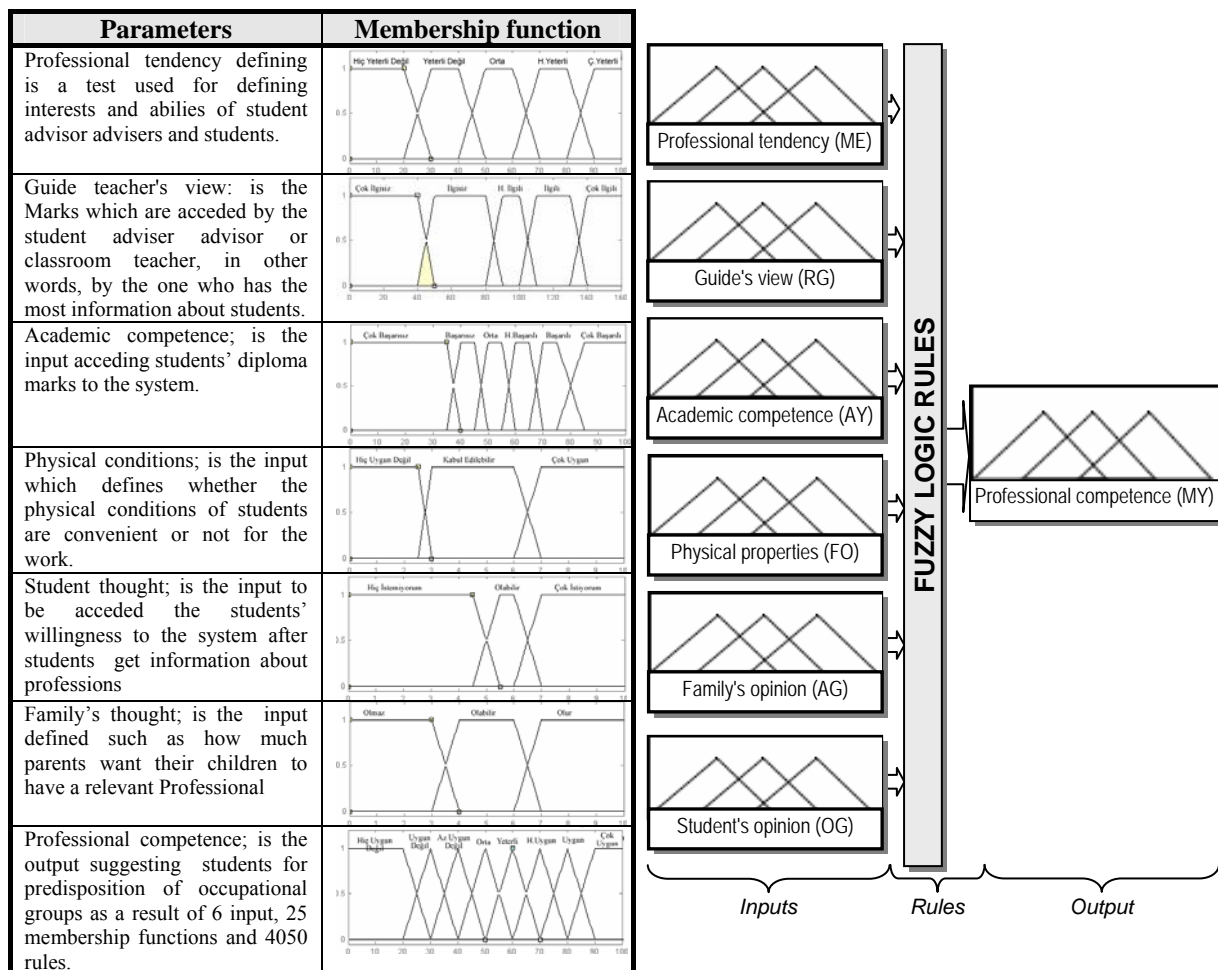| Parameters	Membership function
Professional tendency defining is a test used for defining interests and abilies of student advisor advisers and students.	
Guide teacher's view: is the Marks which are acceded by the student adviser advisor or classroom teacher, in other words, by the one who has the most information about students.	
Academic competence; is the input acceding students' diploma marks to the system.	
Physical conditions; is the input which defines whether the physical conditions of students are convenient or not for the work.	
Student thought; is the input to be acceded the students' willingness to the system after students get information about professions	
Family's thought; is the input defined such as how much parents want their children to have a relevant Professional	
Professional competence; is the output suggesting students for predisposition of occupational groups as a result of 6 input, 25 membership functions and 4050 rules.	

Figure 3. Block diagram of designed system

5. DESIGNED PROGRAMME AND SIMULATION

The basic processes for designing the program are explaining in Table 1 and its comparative results with average of profession lessons marks (MdNO) are given in Table 2.

Table 1. Process in designed program

Process	Screenshot
Adding Students: The program in this section, student information (identity number, name, surname, address, telephone, e-mail, birthday, and photo) is taken. ID check will prevent the re-registration.	
Students entering points: in this section of the program, the student's desired professions to determine compliance with that of the entry points into the profession are selected.	
Reporting: Reporting is designed for the two interfaces. The first, all belonging to professional groups of results, given in a report by the collective is generated. The second one is a professional group is selected and the results are reported that belong to professional groups.	

Table 2. Simulation results

	AG	FO	OG	RG	AY	ME	MY	MdNO
Student 1	2	9	5	50	48	70	40	*18*
Student 2	7	9	4	45	57	50	30	*31*
Student 3	7	9	4	50	72	110	40	*30*
Student 4	2	9	7	40	77	100	40	*30*
Student 5	9	10	9	80	86	100	60	*52*
Student 6	9	10	7	55	71	110	60	*27*
Student 7	2	8	5	10	50	50	30	*18*
Student 8	5	8	4	15	54	40	30	*29*
Student 9	9	10	8	70	82	100	60	*55*
Student 10	2	9	9	80	86	40	60	*55*
Student 11	9	10	8	65	76	90	60	*33*
Student 12	8	10	7	65	87	60	60	*46*
Student 13	2	10	4	30	57	50	60	*19*
Student 14	9	10	7	80	72	20	60	*46*
Student 15	8	10	8	55	67	90	60	*25*
Student 16	5	8	5	40	82	80	20	*30*
Student 17	7	8	8	55	81	50	40	*27*
Student 18	9	8	8	65	92	50	50	*24*
Student 19	6	8	7	55	86	130	60	*50*
Student 20	9	8	9	65	63	100	50	*48*
Student 21	9	7	5	35	56	40	20	*33*
Student 22	4	10	5	60	78	100	40	*37*

6. CONCLUSION

School life is one of the most important period of human life, the most efficient way to pass and the community for successful individuals to gain vocational trends should be directed to do very well. Individual's interests and capabilities will be determined in accordance with the profession, should be directed to that area. In this study, fuzzy logic-based approach is presented to relevant processes. The method of presentation, were observed to overlap more with actual results. Fuzzy logic rules and input parameters increasing with the more efficient is evident in the results arise.

7. REFERENCES

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