



THE ROLE OF RULE-BASED TEACHING AND LEARNING IN KNOWLEDGE-BASED SYSTEM FOR MANAGEMENT EDUCATION

¹Mr. SS Rai, ²Dr. AV Nikam,

¹Assistant Professor, ²Associate Professor

¹Department of Computer Applications,

Bharati Vidyapeeth's Institute of Management and Information Technology, Navi Mumbai, Maharashtra, India

Abstract: Rule-based in management education suggest that teachers rely on rules, and so the rules are explained, because the values of rule based are approved. Teachers follow their rules of teaching and learning in management education and they apply rules accordingly. The knowledge-based system plays very important role in management education. This is the important area through which the teaching and learning process can be benefited. The knowledge base system involves various experts' knowledge in terms of rule based. The KBS consists of two main components, i.e., a knowledge-base and a controls selection shell. The role of rule based in knowledge-based system is studied by the researcher and produce the use of such expert system in teaching learning process of management coursed.

Index Terms - Rule based System, Knowledge, Knowledge Based Systems (KBS), management education, expert system, Teaching Methods.

I. INTRODUCTION

Management education is a process by which a student develops an all-round personality and ability for getting job in management area like managerial post. For developing a student's learning orientation, which is complex mixture of experience, motivation and intelligences knowledge-based system can be used. The aim of this paper is to structure rules how teachers see their professional tasks, possibilities, and limits. In the knowledge-based system, the rule of teacher's knowledge defines what teachers perceive as real and important. This study aims to clarify: - 1) what is the rule-based proficiency in teaching, and 2) how rule-based proficiency functions in management education. The study tries to combine both moral proficiency with action proficiency in the teacher knowledge framework. In order to analyze their use and function, this study employs the concepts of recognition rules and realization rules. The aim was to investigate how the rules the teachers reported (recognition rules) were put into practice in their teaching (realization rules).

II. MANAGEMENT EDUCATION

Management Education is growing at very fast speed mainly in the Human Resource Development Sector. Management Education is also referred as Professional Education due to the direct recruitment of management students from the management Institutes through Campus Placement by Corporate Recruiters. Today, Management Education is not only delivered through regular full-time courses but also through part-time and it is also imparted through online and distance modes of education. Nowadays, organization are facing several challenges like globalization, increasing competition, limited resources, deregulation, economic, scientific & social change, rapid advances in technology & growing diversity among the workforce, customer and others. and a focus on high performance, autonomous teams to address issues of quality & satisfaction. An attempt has been made in this study to highlight key components of quality of education of the Management education.

III. KNOWLEDGE BASE SYSTEMS

The knowledge base systems contains both factual and heuristic knowledge. Factual knowledge is that knowledge of the task domain that is widely shared, typically found in textbooks or journals, and commonly agreed upon by those knowledgeable in the particular field.

Heuristic knowledge is the less rigorous, more experiential, more judgmental knowledge of performance. In contrast to factual knowledge, heuristic knowledge is rarely discussed, and is largely individualistic. It is the knowledge of good practice, good judgment, and plausible reasoning in the field. It is the knowledge that underlies the "art of good guessing."

Knowledge based systems get their power from the expert knowledge that has been coded into facts, rules, heuristics, and procedures. The knowledge is stored in a knowledge base separate from the control and inference components. This makes it possible to add new knowledge or refine existing knowledge without recompiling the control and inference programs. This greatly simplifies the construction and maintenance of knowledge-based systems. The various elements of knowledge-based system are:

1. **Input/Output Unit:** This unit provides the interface through which users and developers of knowledge-based system can interact with the system to accept the request or input via input unit and respond to the user via output unit.
2. **Inference-Control Unit:** This unit is responsible for providing the interface between input/output unit and knowledge -based.
3. **Knowledge base:** This unit is responsible for storing all the information in the form of rules which is provided by various experts and be able to produce the results on the basis of request raised by the user.



Figure 1: Elements of a knowledge-based system

IV. KNOWLEDGE BASED SYSTEM ARCHITECTURE



Figure 2: Knowledge Based System Architecture

V. RULE BASED SYSTEM

Teaching often tends to become routinized activity where norms and rules play an important part. This is because teachers tend to develop implicit ways of action in order to make their professional life tolerable and more manageable. Knowledge representation formalizes and organizes the knowledge. One widely used representation is the production rule. The basic idea of using rule is to codify tacit knowledge of teaching and learning in the form of premise-action pairs, which will present knowledge in the form of premise-action pairs. IF-THEN structure of the rule is represented by premise and action clauses. The action clauses consist of a statement or a series statement separated by AND or commas and is executed if the premise is true. The main aim of preparation of rule is to calculate the teaching and learning process.

A rule consists of an IF part and a THEN part (also called a condition and an action). The IF part lists a set of conditions in some logical combination. The piece of knowledge represented by the production rule is relevant to the line of reasoning being developed if the IF part of the rule is satisfied; consequently, the THEN part can be concluded, or its problem-solving action taken. Knowledge-based systems whose knowledge is represented in rule form are called rule-based systems.

Another widely used representation, called the unit is based upon a more passive view of knowledge. Rule based systems are generally composed of an inferential engine, a knowledge-base and a user interface. The items are classified on the basis of the values of some parameters calculated on test outcomes. A rule-based system is a system whose knowledge base is expressed under the form of production rules. Rule-based system has been employed in many applications for decision making. Such systems can also be used for classification. The production rules can be inferred directly from the expertise or obtained through machine learning methods. In general, the rules are in the following form:

IF <antecedent conditions>
THEN <consequent conditions>

The antecedent conditions define the values or the value intervals for one or more input attributes. The consequent conditions define the values or the value intervals for one or more output attributes. In the case of classification, the consequent conditions determine if a given entity belongs conditions are connected using AND logical operator.

For Example: Classroom rules such as "No talking while I am teaching" and "Always follow teachers' directions" are easily applied both to broader situations and more specific incidents during lessons. Teachers largely establish their pedagogical decisions on a set of If-Then rules which cover a wide range of possibilities. Accordingly, these If-Then rule statements can be represented as follows:

If I allow (any) talking while I am teaching

Then I have to do it (all over) again

VI. A PROTOTYPING MODEL: RULE-BASED SYSTEM FOR MANAGEMENT EDUCATION

This paper represents the prototype model which is rule-based system for teaching and learning process which are implemented for management education (specific for MBA and MCA courses). This rule-based system defines teaching rule for the teachers and learning rules for the students. The teaching rules are based on various teaching pedagogy implemented by the teachers for teaching in classrooms. These teaching rules will do the teaching analysis which will produce the quality of the teacher in the form of scores/grade generated by knowledge-based system. This score/grade will help the teachers to improve their teaching quality every time whenever the scores will be calculated. In the similar manner, the learning rule are applicable for students based on classroom learning. These learning rules will do the learning analysis which will produce the learning quality of the student in the form of scores/grade generated by knowledge-based system. This score/grade will help the students to improve their learning quality and abilities every time whenever the scores will be calculated.

Rule based system will be defined on the basis of IF, AND, THEN conditions and also the score will be calculated. The conditions will be entered in the form and the score range for each rule will be lie between 1 to 5 (for minimum score = 1 and maximum score =5) in php programming language.

Then score will be calculated on the basis of entered conditions and it will produce the result of teaching and learning process. There are various teaching and learning rules implemented in the Rule-based prototyping model. Among them few teaching and learning rules are presented in this paper which are:

6.1 RULE-1 FOR GENERATING "A" GRADE AND EXCELLENT FOR TEACHING

IF teacher is teaching using experimental learning (weight=5)
 AND the teacher is helping students to ask great questions (weight=5)
 AND the teacher generating curiosity in teaching (weight=5)
 AND the teacher is trusting the student (weight=5)
 AND the teacher teaches with planning (weight=5)
 AND the teacher is concise (weight=5)
 AND the teacher teaching is dynamic (weight=5)
 AND teacher is teaching innovatively (weight=5)
 AND teacher is approachable (weight=5)
 AND teacher teaches hand on practice (weight=5)
 Then "A" grade is given (Score= 50)
 And the Excellent teaching and learning has performed.

RULES FOR TEACHING INPUT INTERFACE OF PROTOTYPING MODEL

Enter the Subject for Analysis :

Q1 : the teacher is teaching using experimental learning :
 Highly Dissatisfied DisDissatisfied Neutral Satisfied Highly Satisfied

Q2 : the teacher is helping students to ask great questions :
 Highly Dissatisfied DisDissatisfied Neutral Satisfied Highly Satisfied

Q3 : the teacher generating curiosity in teaching :
 Highly Dissatisfied DisDissatisfied Neutral Satisfied Highly Satisfied

Q4 : the teacher is trusting the student :
 Highly Dissatisfied DisDissatisfied Neutral Satisfied Highly Satisfied

Q5 : the teacher teach with planning :
 Highly Dissatisfied DisDissatisfied Neutral Satisfied Highly Satisfied

Q6 : the teacher is concise :
 Highly Dissatisfied DisDissatisfied Neutral Satisfied Highly Satisfied

Figure 3: Teaching rule for producing “A” grade and Excellent

OUTPUT

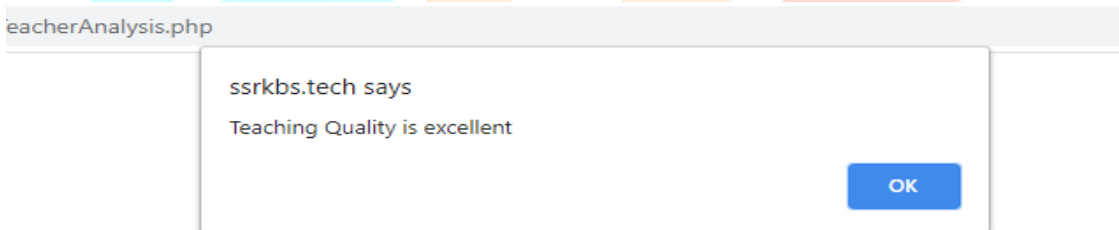


Figure 4: Teaching result for “A” grade and Excellent

6.2 RULE-2 FOR GENERATING “A” GRADE AND EXCELLENT FOR LEARNING

IF students are learning by Doing (weight = 5)
 AND the students are learning for the social (weight = 5)
 AND the students are learning through stories (weight = 5)
 AND the students are learning using small bits (weight = 5)
 AND the students are learning for caring community (weight = 5)
 AND the students are giving intelligent feedback (weight = 5)
 AND the students are learning using more than one intervention (weight = 5)
 AND the students are learning with attention (weight = 5)
 AND students are learning with creativity (weight = 5)
 AND students are learning using technology (weight = 5)
 Then “A” grade is given (Score=50)
 And the Excellent learning has performed.

RULES FOR LEARNING INPUT INTERFACE OF PROTOTYPING MODEL

Enter the Subject for Analysis :
C PROGRAMMING

Q1 : the students are learning by Doing :
 Highly Dissatisfied Dissatisfied Neutral Satisfied Highly Satisfied

Q2 : the students are learning for the social :
 Highly Dissatisfied Dissatisfied Neutral Satisfied Highly Satisfied

Q3 : the students are learning through Stories :
 Highly Dissatisfied Dissatisfied Neutral Satisfied Highly Satisfied

Q4 : the students are learning through Stories :
 Highly Dissatisfied Dissatisfied Neutral Satisfied Highly Satisfied

Q5 : the students are learning for caring community :
 Highly Dissatisfied Dissatisfied Neutral Satisfied Highly Satisfied

Q6 : the students are giving intelligent feedback :
 Highly Dissatisfied Dissatisfied Neutral Satisfied Highly Satisfied

Figure 5: Learning rule for producing “A” grade and Excellent

OUTPUT

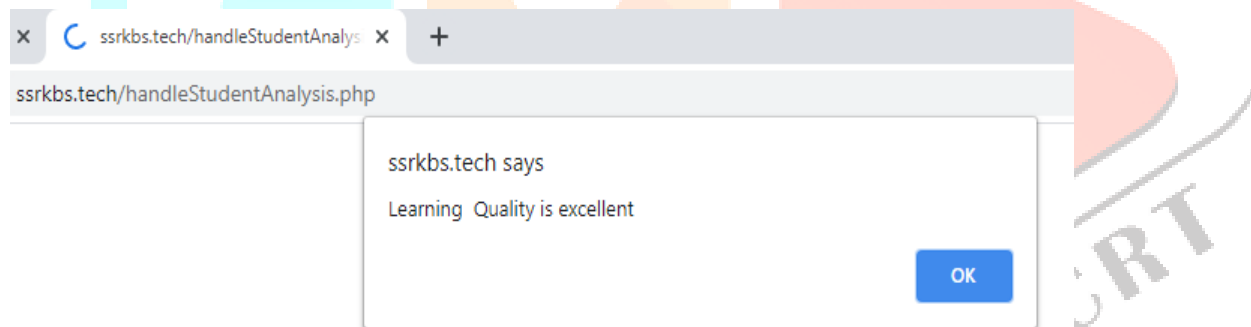


Figure 6: Learning result for “A” grade and Excellent

NOTE: All the conditions given in the above rules will contain the weight range lying between 1 to 5. The obtained scores/grade will produce the result of teaching and learning process. Weight for each condition is being given on the basis of expert advice which was collected at the time of data collection. Some decision for giving the weight for each condition was also taken on the basis of secondary data which was available in book and on various websites.

VII. CONCLUSION

This paper presents role of rule based in knowledge-based system (KBS) which are being implemented in management education. Some of these have already been implemented in management education and results of which are visible with the output produced by the system. Teachers rely on rules, and therefore the rules are justified, because their values are proven and therefore approved. Teachers think, both implicitly and explicitly, that their rules of practice work. And because they work, teachers apply the rules accordingly. Teachers justify this link by reasoning that there is a connection between the rules of practice and their supposed or intended outcomes.

The paper represents the rule-based prototyping model where teachers and student’s analysis will be generated based on the entered input every time. Accordingly, the teaching and learning quality analysis is done and the improvement for teaching will implement for further. The authors are of opinion that the development of KBS using rule based in management education really helped for improve the quality of teaching and learning. This prototyping model will produce the teaching and learning analysis and generate the score and grade accordingly.

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