

Chapter 3

Intelligent Educational Support System

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ABSTRACT

Increasing student numbers lead to new needs in the education sector. New systems are needed due to expert numbers that are insufficient in specialties, such as instructors, directors, and advisors. Type, goal, and specialty of intelligent systems programmed to satisfy this need are being developed with each passing day. The aim of this chapter is to develop an intelligent system that provides support with schedule, academic orientation, choice of profession, and career planning to students. To make a regular schedule for students would generally cause an inappropriate program, which is hardly followed by students in case they were indiscriminately prepared without any information about students' characteristics. Instead of this method, it is the point to be familiar with the academic success, study, resting, and even meal time of the student, and to know which lessons are studied on which days and to make an appropriate schedule for studying. According to the teachers, it is time-consuming and difficult to perform this method for all students. Within this scope, an intelligent system preparing a study schedule is developed considering the students' characteristics and study habits.

INTRODUCTION

Use of man power is relatively reduced while computer technology goes into human life and it starts to give way to intelligent systems that can be controlled by computer. Nowadays, computer technology is effectively used in many sectors such as health, banking, communication, transportation, electric-electronic, engineering and security. In addition, computer technology is used in the field of educational sciences in different and effective application ways.

One of the problems of educational sciences is high student numbers due to increase in global

population. To solve the problem, educators try to prepare individual learning and study platforms by using technology.

Computer provides social, occupational and pedagogic reality to education and this enabled effective and efficient use of computer in education. The intelligent systems developed for this purpose is designed as the systems that can think, decide and adapt to itself to various situations (Akkoyunlu, 1995). The intelligent systems used for education are computer based educational software that can interact with student, contribute to learning and present content according to readiness of student. In addition, they can give feedback like a guide and

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keep student personal information and data about the relationship with the system (Murray, 1998). Intelligent educational systems decide to present information according to pedagogical guidance, data from individuals and rules and it adapts itself according to personal information requirement. This distinguishes it from other computer based educational systems.

Most studies have showed that educational software applying different methods are effective when individual differences are considered in terms of learning period and outcome (Al-Hammadi and Milne, 2004; Altun, 2006). In addition to using as tutorial software, intelligent educational systems are used for different purposes such as guiding student, assessment and evaluation (Mark & Greer, 1993; Günel, 2010). In this study, an intelligent system suitable to individual characteristics of students was developed for guidance.

INTELLIGENT SYSTEMS

The stages of Knowledge Acquisition are present to take the conclusion by configuring information in the intelligent system. Within the context of this study, the system was programmed in line with these processes. They are: Acquisition, Representation, Validation, Inferencing, Explanation.

These stages in the system include revealing the rules and procedures used during problem solving and collaboration of knowledge engineer and leading expert to code. Knowledge Acquisition includes obtaining information from people, books, documents, sensors, and computer files. Representation is the stage that obtained information is organized. It includes formation of knowledge map and to code in knowledge base. Validation is to validate and confirm the information in knowledge base by using test conditions until the quality reaches acceptable level. Inferencing includes interpretation by using database by using database and then, it includes design of software that provide to present suggestion

about certain points. Explanation is the stage that includes explaining and presenting the inferences in line with information and rules (Jones, 2008).

Intelligent Systems contain two sub-systems (Lee & Kim, 1998). Knowledge Base and Inference Mechanism. Knowledge base can be organized according to one or more configurations (schemes) such as databases, associative, hierarchical, network etc. Created knowledge representative schemes have 2 basic features: They are recorded to computer memory by coding with current programming languages. The facts and contents of representative schemes are designed in such a way that other information can be reconsidered (Jones, 2008).

In intelligent systems, information should be represented properly for effective study of knowledge inference mechanism. For this purpose, some representative schemes were determined.

Representation in Logic: It is the oldest representative scheme. Knowledge entrance is done, premises or facts. These are the inputs of logical process. The logical process functions with these inputs. Outputs are produced: inferences and results.

- **Propositional Logic:** This suggestion includes expression that can be true or false. After what it is known, it becomes an input that is used to derive new suggestions or inferences. Rules are used to determine whether new suggestions are true (T) or false (F).
- **Lists:** Lists and trees are kind of representation of information found in hierarchical structure. They are the series that relevant materials are written. Ex: The name list of employees in company, the to do list, the list of products in catalogue etc. They are used when objects are grouped, categorized or graded according to relationship or line. Objects are grouped as similar materials. Relationship between groups are demonstrated with connections.

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