

## Designing an Expert System for learning improvement

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### Abstract

It is proposed that practical and team work related talent for students may be trained through discussions practices and reflection. An expert system can reinforce this approach by cyclically reminding the students to reflect on how they are, and how they should be, working together. This can have a significant improvement on their task performance.

Proposed is a paradigm for learning technical studies for getting better outcomes. The traditional paradigm for learning distinguishes different aspects of learning style to describe the practice, a student recognizes new intake of wisdom. For example, Active learners prefer to be actively involved in learning or learn by doing (experimenting, problem solving, etc) while reflective learners understand best after having been afforded the time to think or reflect on the material presented. Visual learners prefer graphics such as diagrams, charts and pictures or visual demonstrations; verbal learners prefer that information be presented in written or spoken words; intuitive or sensing learners are more practical and look for specific facts. Universal learners would rather have new knowledge represented in the broader portrait while chronological learners prefer information to be presented in an organized, step-by-step manner. The other category of learners refers to the preferred order in which the information is processed.

### Keywords

Expert system; teaching tools and methodologies; innovations in education, computer based learning, technical training;

## Introduction

Trainers (corporate trainers, lecturers, professors, school teacher and others) are expectant to use team work of students in addition to their subject training as it improves their (students') academic and social skills. Team work include complying on an objective, justifying arguments, and determining & taking responsibilities etc.

In the direct mode of delivery the content following capabilities are generally not available for an educator utilizing a traditional delivery system which are available in proposed strategy.

- ❖ Navigation systems to support both linear (sequential) and non-linear inquiries of the content (knowledge base or hyper-media).
- ❖ Different formatting options of the content (eg both text and graphics).
- ❖ Modifying capabilities for correcting, adding and deleting content breadth and depth
- ❖ Varying pace for displaying the content.

Expert system will preserve all learning precedences of batches of scholars and utilize further delivery of content. By using an expert system to encourage scholars to reflect on their use of group skills, their self-assessment of performance, which is a side effect of this process, provides the necessary information.

## Improving learning system

The approach for learning is projected here, using an expert system to bridge above stated gaps. This expert system is the meansto support individually tailored user interfaces and provides the ability to test students for knowledge gains, retention and misconceptions.

Here, the main concern is to bridge the gap between the academic researchers and the instructors. Academic researchers are the significant people who understand the learning process, the authors that provide knowledge sources (e-books, e-solutions manuals, etc). On the other end instructors are there who develop and package the course content and assess student knowledge, misconceptions and retention. Here, the expert system and content, although separate, interact to produce unique interfaces for each individual including the instructor.

The teacher based module permits the instructor to access the knowledge base of possible content to customize courseware and topical content for students as based on the course learning objectives. The end result is a learning structure map of the specific topics and prerequisite knowledge required to support the course's learning objectives and a set of choices made by the instructor to support the delivery of the Curriculum Stuff with the help of theory classes, practical sessions and the assessment methodologies like Assignments, Projects, Tests, Quizzes.

The students oriented module routine involves the expert system assessing the incoming knowledge of students (varying degrees of prerequisite knowledge) and their preferred learning style. As learning is achieved, the student updates his/her mental model of knowledge. Since mental models

cannot be documented, a student structure map is used to assess the amount of knowledge a student has attained at any point within the learning process. Now, both the teaching structure map and the student structure map represent the knowledge or level of understanding of a particular topic and can be represented linguistically, graphically, symbolically, etc.

The goal for the expert system is to evaluate the scholar thinking model against the teaching approach in order to identify missing or incorrect (misconceptions) student knowledge. The expert system then utilizes the missing or incorrect (misconceptions) student knowledge to obtain the appropriate content required to continue the learning process

### **Consideration of feedbacks**

The system is aimed to promote scholars' manifestation: their expressions, demonstrations, discussions etc. At the start of the operation, batches of scholars are asked to select some criteria from a list of team talent (e.g., "exchange ideas", "listen to each other") or to create their own. One of these skills of team talent is randomly selected at intervals during the activity, and the scholars are asked individually to assess the proportion of time that they used it, on the gauge of 10 points (zero for no time and 10 for all of the time). The duration assessed is the time since the last request.

Using the scholars' consequences, detect a query for manifestation (their expressions of views, discussions). It may inquire the scholars to agree:

- i) an instance,
- ii) an elucidation for the divergence between the perceptions, or
- iii) a proposal to enhance skill usage.

The query acts as a specific prompt for contemplation-in-action. The manifestation aims to clarify definitions and perceptions.

At the end of the operation the scholars are asked to register their perception overall. This promotes reflection on performance, which aids strategy enhancements for future behavior, i.e., contemplation-on-action. The competence of the model is dependent on the scholars performing the operations demanded. If the interaction registered is precise, the expert system can provide an assessment similar to the Educators', using a combination of the scholars' contemplation-in-action and contemplation-on-action scores.

Educators who teach using learning objectives provide their students with learning advantages, regardless of the delivery system chosen [6]. Learning objectives are active statements of what a student is supposed to accomplish (eg at the end of a particular course, a student will be able to create successful project). Establishing clearly defined learning objectives assists an educator in developing content and assessment tools to identify knowledge gains and misconceptions (concepts learned incorrectly, eg a student is able to calculate the effect but identifies the wrong cause for that effect). Learning objectives may be as follows:

- Acuminating Knowledge : a scholar can recall the information presented.
- Grasping: a scholar can restate the idea in different words.
- Relevance: a scholar can apply the knowledge appropriately to solve a problem.
- Analysis : a scholar can break a problem into its components and note the relationships of the components.
- Production : a scholar can rearrange component ideas into a new whole.
- Assessment : a student can make decisions based on the whole situation .

Many institutes have seen their traditional, lecture-based delivery system replaced with online or electronically based interactive lecture-halls, which has placed increasing demands on engineering faculty (instructors) to provide electronic course content and interactive assessment tools (assignments, projects, quizzes and tests). Although the ability of the electronic classroom to actively engage the student has been well documented, research lags in documenting or assessing whether these new environments are more effective than the traditional classroom in terms of increasing the amount of learning students achieve or if the electronic classrooms are more effective in supporting the retention of new knowledge.

## Conclusion

Expert systems are favorable as teaching means because it is provided with exclusive aspects and also it allow the students to ask questions on how, why and what.

The objective of this paper is to propose a paradigm that supports the delivery and development of course content according to precise learning objectives, in a format customized to an individual's preferred learning style, evaluation of student knowledge to identify misconceptions and the ability to develop and revise course content to close gaps in knowledge.

The proposed paradigm encompass the routine that interacts to achieve learning: a scholars-oriented approach that utilizes learning theory and assessment research to present the course content to students and direct them through course content when delusions are identified. It contains one more trainer-oriented schedule to develop and revise course content based on learning objectives and gaps in knowledge.

The goal for this is to evaluate the students' thought process against the teaching approach in order to identify missing or incorrect (misconceptions) student knowledge. The proposed paradigm then applies the missing or incorrect (misconceptions) student knowledge to obtain the appropriate content required to continue the learning process.

Subject learning and team work, are two of the most important decisive factors for the selection of scholars within the industry. Promotion of an expert system for the same will be a significant move for applying the concepts and techniques in the field of education.

### **Future scope**

Consequently from this research work, a number of research questions arise. For a more complex system, how much training would be required to train an expert system to a satisfactory level? To what degree should outlier decisions be identified and included in the simulation/expert system? The aim of future research will be to investigate these questions, the next stage being to develop a model of a real system.

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