Online Learning – CBR Approach

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Abstract: **Online learning is becoming very popular where internet provides wide variety of tools, aids that provides the learning material (notes, question – answers, assignments, problems). An internet is a unique platform to connect learners with educational resources. Many researchers have focused on developing e-learning tools to facilitate the students. But, they neglect the learning behavior of the students, their difficulty levels and the essential things required for their courses. Therefore, in our system we focus the CBR approach in students learning. In our proposed system we can generate the appropriate course material as per the work background of the students through online learning.**

Keywords: **CBR, e-learning**

1. INTRODUCTION

The major challenges in teaching are to improve the instructional productivity and quality learning. A case based reasoning (CBR) system can be seen as a special type of knowledge based system[2]. Case based systems deal with cases or episodes which represent instances of concepts or their generic form [3].

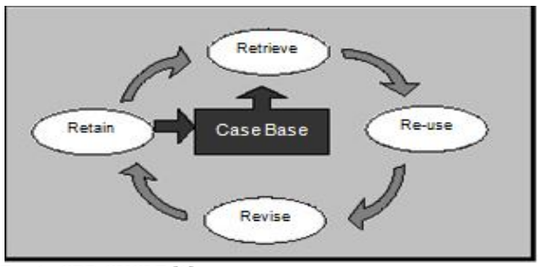

FIG. 1: CBR CYCLE [1]

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In general, CBR cycle can be described by the following four processes [2]:

- **Retrieve** the most similar case or cases
- **Reuse** the information and knowledge in that case to solve the problem
- **Revise** the proposed solution
- **Retain** the parts of this experience likely to be useful for future problem solving.

Online learning where students have different behavior, culture. In this paper, we conceptualize a system to support students and their learning behavior. We kept the profile of the students in a Case Base. The system maintains the behavior of students, the pattern through which information retrieved. The Case Base holds knowledge base, learning style, and interesting field. The system facilitates the notes, points, learning content and instructional material [5].

2. PROPOSED CBR SYSTEM

The proposed system is based on finding the different cases, the learning patterns of the students. It preserves past cases in Case Base. A system has basic three components Student, Teaching Aid and Course. All these components have an interface through which students can post the cases, problems, requirements[5].

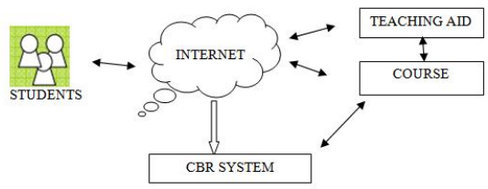


FIG. 2: ONLINE LEARNING SYSTEM

The following characteristics that fulfill the CBR approach for student modeling:

1) In the learning environment students, teaching aids and corresponding study material are kept across the network.
2) The student's behavior, background knowledge, and skills are kept in Student Case Base of CBR System.
3) Students generally attempt to register in various

courses at the same time. The system highlights the common features and categorizes the same.

3. STUDENT MODULE

The process of student modeling is shown in figure below. The following activities take place during the student modeling when the student interacts with the system.

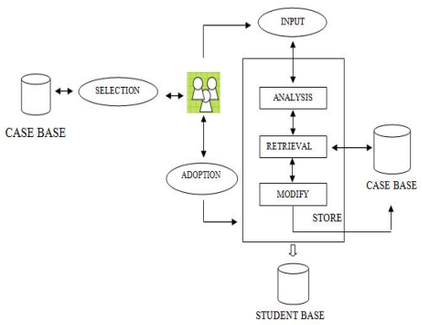


FIG. 3: CBR BASED MODEL [4]

Inputting a new case

A new case means the learner unable to get the desired solution. The new case may be processed and further treatment, assessment arranged by the CBR system. The reasoning mechanism of CBR will search for the most similar case in order to support the activities.

Analyze an inquiry

It is very difficult to analyze the cases by the learners. We maintain an index, for case evaluation, so that is easy to analyze the case and provide the desired solution.

Case retrieval

The case-based reasoning system saves a lot of data for reference. It holds the cases in Case Base.

It locates the solution for the most similar case by comparing the similarities. It will provide an approximate appropriate result to the learners. We are using the case retrieval methods such as inductive learning, knowledge inference, nearest neighbor. It is easy to get the instruction manuals, notes to the learners by effectively applying the case retrieval technique.

Case adaptation and reuse

It will be possible that, we need to modify the retrieved case. We need to use the different adaption methods in order to solve the problems of new inputted case by the learner. We are applying exact adaptation, interpolation method or adaptation rules.

Revision of a case

When the solutions of the similar cases that were picked out are not suitable for the new case, revisions can be used. A new solution will be generated and it is treated as a final one.

Retaining a case

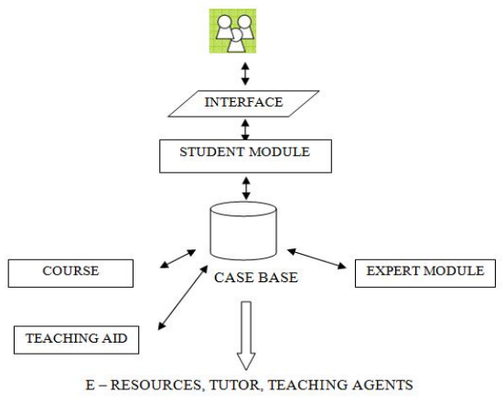
Save the case into case base to enhance its completeness and to consolidate the self-learning mechanism of the system.

4. ARCHITECTURAL VIEW

The architecture focuses on indexing as the key to reuse of what is learned from experience. In addition to having experiences, students should reflect on and assess those experiences to extract both what might be learned from them and the circumstances in which those lessons might be appropriately applied.

The CBR cycle through which an application of what they are learning, interpretation of feedback, and explanation and revision of conceptions several times.

Online learning by a CBR approach focuses on the role previous experience plays in reason- ing suggests that learners should be encouraged to reuse their own previous experiences. It also suggests that they might be helped along to solve more complex problems than they could by themselves by having access to the cases (experiences of others).



The architectural module has divided into basic

components Student Module, Expert Module and Teaching & Course Module and has a basic interface with support of Case Base and internet e-resources.

The interfaces of student module, is an interface between the course & teaching aid in support of expert module. The expert module maintains the record of student profile while operating the system. The expert module identifies the cases raised by the learner and their requirements.

The course system manages the course material as per student's requirement. The teaching aid decides the topic or lessons, to be supplied to the students according to student's background. The student module keeps the record in case base for future reference and manages the student performances and course material accordingly.

Following are the basic operations that can be carried out while interacting with CBR System.

Student Module: To analyze the students learning behavior, pattern, the problems given to the system

Expert Module: To retrieve the desired solution from the case base

Course: To store and process, categories the problem domain in a course

Teaching AID: The information content, study material

The student gets interacted with the CBR System via an interface. The student post their queries, cases to the CBR system through system module. The cases is compared with the existing available cases. These past cases are stored in case base. If the new case appeared, then it will be handled by the CBR Cycle. The student retrieves the desired solution via Course, Teaching aid via internet. The educational material in hypermedia form in a Web-based educational system makes learning a task-driven process such as E-Resources, Tutoring tool and teaching agents.

5. CONCLUSION

CBR approach emphasizes the need for students actually to carry out and test their ideas, not just think about them.

CBR-based online learning is for personalized knowledge database and self assessment analysis system. The proposed learning system considers the subject difficulty level to a successive level to enhance the students leaning behavior.

This paper makes the basic contribution to generate appropriate course materials to learners based on individual learner requirements, and help them to learn more effectively in a Web-based environment.

6. REFERENCES

[1] Janet L. Kolodner, Jakita N. Owensby, and Mark Guzdial (2008). *Case Based Learning Aids*. New York Springer. 32, pp. 829 – 861

[2] Rajendra Akerkar (2012). *Introduction to AI*, PHI Eastern Economy Edition.

[3] Campbell, J M and Smith S D (2006). CBR *research using the 'Think', 'Plan', 'Do' classification method*. Association of Researchers in Construction Management. pp. 177-186.

[4] Mu-JungHuang, Hwa-ShanHuang and Mu-YenChen (2006). *Constructing a personalized e-learning system based on genetic algorithm and case-based reasoning approach*. Ecpert System with Applications. Elsevier Publication pp.1-9.

[5] O. P. Rishi, Rekha Govil, and Madhavi Sinha (2007). *Distributed Case Based Reasoning for Intelligent Tutoring System: An Agent Based Student Modeling Paradigm*. World Academy of Science & Engineering pp.273 – 276