HARNESSING INTERACTION BEHAVIOR FOR LEARNER MODELING

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ABSTRACT

E-learning is the use of technology which facilitates people to learn anytime from anywhere. The term e-learning refers to using electronic applications and courses to learn. E-learning applications and courses include virtual classrooms, computer-based learning, web-based learning and digital collaboration. Every e-Learning system stow data about the learner deeds in log files, which give us thorough information about learner behavior and learner modeling. The Learner Model is a model of the knowledge, difficulties and misapprehensions of the individual learner. Every learner has different learning style, characteristics, and desires. The present work of the learner model technique is monitoring the User Interaction Behavior. The interaction behavior is traced by three indicators: Navigational indicators for analyzing number of upward/downward navigation, jump distance, number of times help accessed, number of times search accessed etc. Temporal indicators for analyzing time spent on different types of content and assessment. Performance indicators for analyzing attempts on assessment questions, performance on tests etc.

Key words: E-Learning, Interaction Behavior, Learner Model, Learner Behavior, Log Model

I. INTRODUCTION

This paper deals with predicting user behavior in an e-Learning environment. In this Interaction Behavior (IB) is recognized as a major component of e-learning. User Interaction Behavior (IB) personates a title role in predicting learner modeling [1]. In E-Learning environments new ways of motivating or re-motivating learners are required. Several approaches addressing motivational issues have been proposed including the design of attractive e-Learning systems, using game features to motivate learners, using whiteboards and clickers as well as animated agents. This paper introduces two aspect of learner's motivation. One is efficient and another aspect is inefficient, it can be traced by monitoring the learner deeds [8] (e.g. reading pages and taking test/quizzes). These approaches focus on making the interaction behavior attractive rather than addressing motivation in a personalized manner. So by making use of this approach in Scriber Learning Tutor (SLT), efficient and inefficient learner can be predicted. For example, Scriber Learning Tutor Mandate multiple-choice questions for the purpose of estimating learner's behavior. Suppose if the user is not taking questions properly then it will result as inefficient learner. Similarly if the user is superior in all tasks then we say as efficient learner [1]. The paper is organized as follows: Section 2 discusses Related Research related to the use of log model analysis and learner model. Section 3 describes the information contained in the log model which is used for predicting learning style. Finally section 4 concludes a paper with the implication of future work.

II. RELATED WORK

Many E-learning courses can be presented in different ways. For example 'Using Games-Based eLearning Technologies in Overcoming Difficulties in Teaching Information Systems' [9] is provided with games-based eLearning technologies can be used to enrich the Information Systems (IS) learning experiences of students with different learning styles. Before considering these contributions, some background material on e-Learning is useful.

Interactive Whiteboards in Education is provided with technology allows you to write or draw on the surface, print off the image, save it to computer or distribute it over a network. A computer screen image is projected onto the surface of the whiteboard and then either control the application by touching the board directly or by using a special pen. The drawback is that they may not be used to their full potential, this may change as users become more familiar with them and are more readily available.

Promoting motivation and Eliminating disorientation for web based courses by a multi-user game [3] is provided with game show i.e. some students may feel difficult to use links so to prevent the learner's disorientation they provided the courseware as computer game.

The Influence of learning styles on Learners in e-Learning environments is provided' with e-learning system those of traditional instructor-based learning, on student learning, based on student learning styles. The goal was to determine if e-learning is more effective for those with a particular learning style.

III. PROPOSED WORK

The work of the Scriber Learning Tutor (SLT) is to manage users, Learning materials and Learning events. It also manages and administers Learning progress and keep track on learning performance in log files. E-Learning system designed to stow data about the learner's deeds in log files, which give us detailed information about Learner Behavior and Learner Modeling.

A. Log Model Depiction

In this section for tracing limited number of log files events we form a E-Learning course called Scriber Learning Tutor (SLT). Log files data analysis is used to guess motivational level of learner behavior and learner modeling. Logging the Interaction Behavior (IB) in Scriber Learning Tutor gives the chance to trace their learner's deeds at a refined level. Moreover, learner aim and posture while interacting with Scriber Learning Tutor (SLT) are habitually hidden and mysterious i.e. every interaction behavior of learner and SLT is logged in a server side database and allow SLT to trace the events such as time spent, help, tests, hyperlink, search, pretests etc. In the first column list of all possible events that are recorded by Scriber Learning Tutor is presented in Table 1. The second column display parameters/attributes which is used for Tracing Learner Behavior. For Example, two attributes related to Hyperlink are: the number of times link accessed and the average time spent on each link.

B. Learner Behavior

The Learner Behavior was developed by using Scriber Learning Tutor (SLT) data. Moreover by analyzing this Learner behavior learning style can be predicted. For this the motivation level of each learner is traced whoever interacting with the SLT. Besides online course play a important role in analyzing Learner behavior i.e. some learners find it easy to learn in a particular course whereas others find some problems in Learning the same course. Some desire to learn specific material such as data and facts; others prefer abstract content like theories and their underlying

Table 1. Materials Contained in Scriber Learning Tutor (SLT) log files

Events	Parameter	Depiction
Login/ logout	User ID	A unique identifier for each other
Hyperlink	Number of times hyperlink accessed. Average time	
Search	Number of times search accessed. Average time.	Terms searched
Tests	Number of tests taken Average time	The time spent for performing tests
Pre-tests	Number of pre-tests taken Average time Number of correct answers Number of incorrect answers	The time spent for performing tests
Reading pages	Number of pages Average time	The number of accessed Pages
Motivation	Efficient/Inefficient	Tracing motivation of learners
Help	Number of times Help accessed Average time	Looking for help about the learning content

meaning. The reason is each and every learner hold individual behavior and posture, similarly their learning style also vary according to learner behavior.

So by summarizing the information from the log model, four categories of learner behavior have been identified:

- learners who spend less then approximately 45 minutes reading; they are classified as inefficient;

- learners who spend more them 45 minutes reading and with a performance that exceed

63%; these learners are classified as efficient;

- learners who spend more than 45 minutes reading and with a performance between 49% and 63%; they are classified as inefficient;

- learners who spend more than 45 minutes reading and with a performance below 49%; they are classified as efficient.

Table 2. Rules for motivational Level of Learner's

Efficient	Inefficient
Click-through pages (consecutive access-page events) with an average of at least 60 seconds per page	Click-through pages (Sequence access-page events) with short time per page (less than 20 seconds)
Affordable time spent per page/test (between 60 seconds and 10 minutes)	Very long time spent on a page/test (above 10 minutes)
Automatic logouts from the system due to inactivity (for 30 minutes)	Lack of automatic logouts

IV. LEARNING STYLE PREDICTION

Each and every Learner has separate ways of Learning Style and behavior. Suppose the learning style of a student does not match with the teaching style in an educational environment, then the learners may have glitches in learning. But In Online learning systems, additional concentration is paid on incorporating learning styles and providing courses that fit to the Learner individual learning style. Predicting learning styles helps educators to understand how people observe and handle the information in different ways. Moreover, in the study on predicting Learning style success with the Learning Behavior and Study Strategies Inventory found that motivation and posture were the best predictors of Learners grade point average.

Using Scriber Learning Tutor (SLT), we can Predict Five type of learning styles of Learner. Extrovert learner will be good in every Task and also will prefer to learn extra source, Introvert learner will prefer

problem, Sensing learner will prefer test, and Intuitive learners prefer to learn abstract material from such as theories. Making use of this learning style we can provide a style to each learner behavior. Learner model is shown in fig.1
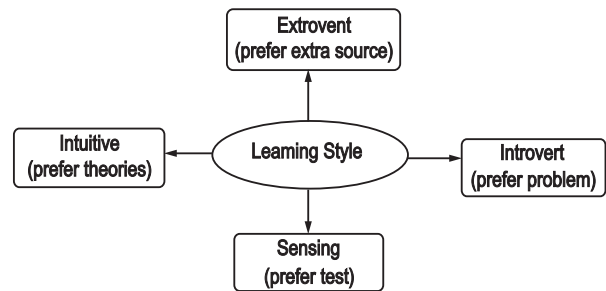

Fig. 1. Learner Model

V. IMPLEMENTATION

Each and every learner has different choices and needs. Therefore, it is very essential to provide the different styles of learners with different e-learning environments that are more needed and more important to them. This paper reports a study of tracing user behavior in an e-learning environment, so we devised a specific learning system i.e. Scriber Learning Tutor based on the learning behavior and learning-style model. So that different learner choices are revealed through user interactions with the learning system. Using this interface, learning styles are predicted from learner behavior and this interactions are logged on a server side database called Log Model.

VI. CONCLUSION

Scriber Learning Tutor (SLT) assists in planning, organizing, and delivering quality of web-based courses in a way that will improve Learner behavior and Learner Modeling. The purpose of this paper was to determine how the user interaction behavior, Posture, and learning styles influenced achievement in online courses. Furthermore in this paper we have presented three Interaction Behavior (IB) i.e. Navigational Indicators, Temporal Indicator, and Performance Indicator and by Performing this Behavior we can Predict our learning style dynamically. Moreover, we presented investigations about the Interaction behavior of Learner in an online course within a Scriber Learning Tutor with respect to the users learning styles. In future we can present an Amusing Scriber Learning Tutor that
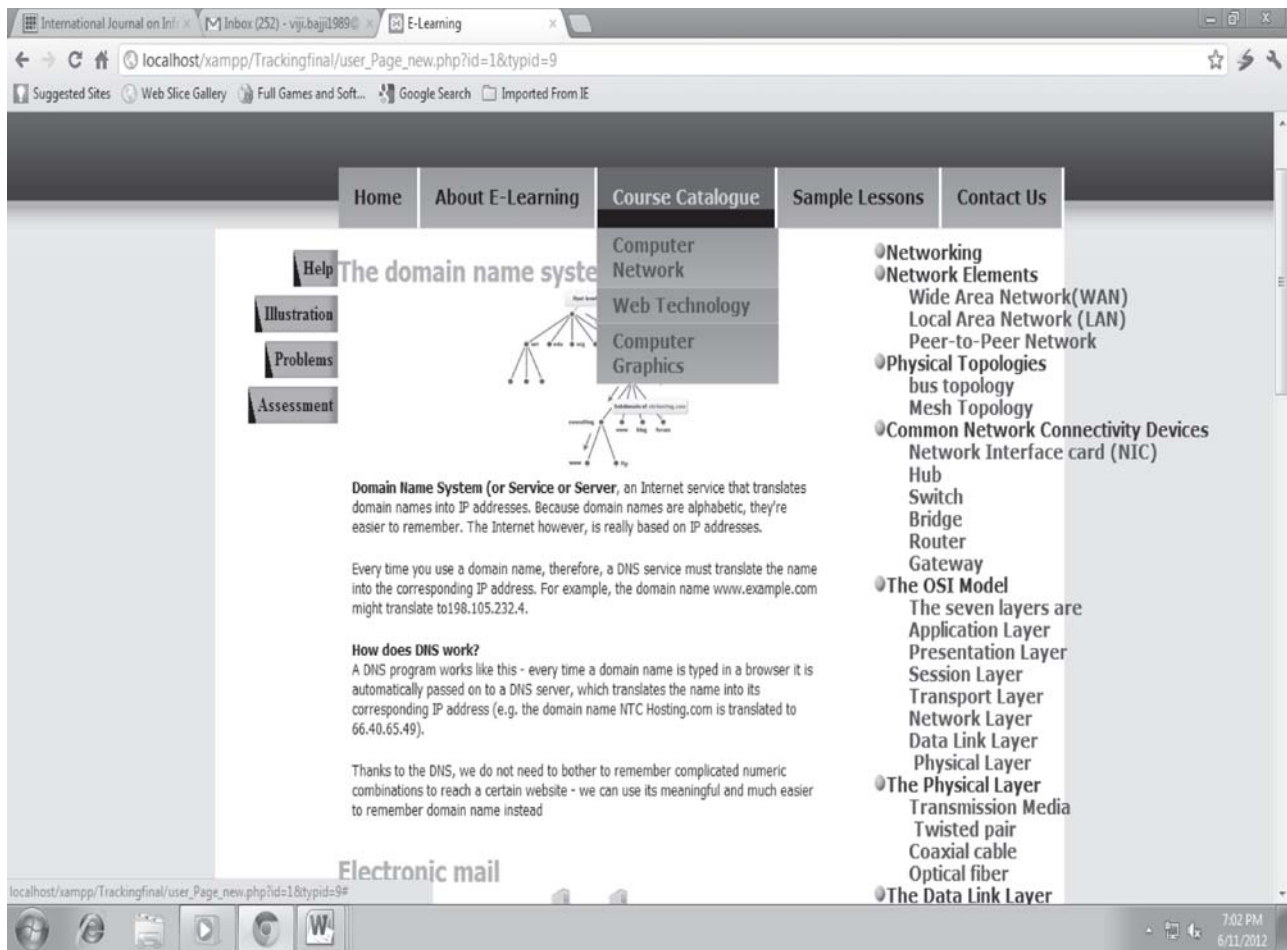
Fig. 2. Scriber Learning Tutor Screenshort

work with Multiple Learning Style and also many techniques for upcoming Learner. The screenshot of scriber hearning tutor is shown in fig.2.

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