Evaluation of an Educational adaptive hypermedia 
System called SQL Course

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Abstract

Adaptive Hypermedia Systems means all hypertext and hypermedia systems which reflected some features of the user in the user model and applied on this model to adapt various visible aspects of the system to the user, Evaluation of adaptive hypermedia system is generally considered to be an important part of research and practical application of the adaptive hypermedia systems. It is important to know whether a particular adaptive technique work in this domain, the context where it is more potent, and the scale of the adaptation effect it produces, in this paper an adaptive Web-based educational hypermedia system, called SQLCourse (Structure Query Language) is evaluated. The evaluation focused on the adaptivity feature of SQLCourse website, the questionnaire and checklist is used to evaluate different adaptivity features, an analysis a queried survey data showed in this paper.

Introduction:

Adaptive Hypermedia Systems means all hypertext and hypermedia systems which reflect some features of the user in the user model and apply this model to adapt various visible aspects of the system to the user [1]. Adaptive hypermedia systems have started to appear around 1990s, when researchers combined the concepts of hypertext / hypermedia with user modeling and user adaptation. The first and primary application of adaptive hypermedia was in education, where the navigational freedom of hypermedia was introduced into the area of intelligent tutoring systems, a number of researcher teams had recognized the problems of static hypertext in different application areas, and had begun to explore various ways to adapt the output and behavior of hypertext systems to individual users [1], The first workshop on Adaptive Hypermedia was held during a User
Modeling conference and, finally, a special issue of User Modeling and User-Adapted Interaction (UMUAI) on adaptive hypermedia was published in 1996. By that time, several new adaptive hypermedia techniques had been developed, and several research-level adaptive hypermedia systems had been built and evaluated [1]. In particular, several new research teams have commenced projects in adaptive hypermedia, and many students have selected adaptive hypermedia as the subject area for their PhD thesis [1].

Adaptive hypermedia systems are those systems that change their context according to their behavior, adaptive refers to the ability of the system to change its responses in reaction to runtime environment, users, and other parameters, and it is one of the most popular approaches of personalized information access [7].

The evaluation of adaptive hypermedia systems is a new research direction in the field of adaptive hypermedia systems, in general the evaluation is considered to be an essential part of research and practical application of the adaptive technologies, and it is important to know whether a particular adaptive technique works, the context where it is stronger, and the scale of the adaptation effect it produces [2].

Objectives
The evaluation of an educational adaptive hypermedia system is very important to explain the best way for online learning and delaminate the level of students that may start the online learning, the objective of this paper is know the techniques used to evaluation of adaptive educational websites to determine what factors or features to be evaluated in Educational Adaptive hypermedia Systems and to develop an adequate techniques to evaluate the specified features.

The methods and techniques for adaptation:
Adaptive presentation Methods: Additional explanations, Prerequisite explanations, Comparative explanations, Variants and Sorting.
Adaptive presentation Techniques: Conditional text, Stretch text, Fragment variant, Page variants and Frames. Adaptative navigation methods: Global guidance support, Local guidance support, Global orientation support and Local orientation support.
Adaptive navigation techniques: Direct guidance, Link sorting, Link hiding, Link removal, Link annotation and Map adaptation the flowing figures explain the techniques [5].
Figure (1) Adaptive presentations Techniques

Figure (2): Adaptive Navigation Support Techniques.
Evaluation of Adaptive Hypermedia System

Evaluation is a complex (and costly) problem, with multiple dimensions, most evaluations to-date is empirical studies of specific adaptive hypermedia systems and applications under particular conditions, focusing on one dimension of the end-user [4].

Methods Used in Evaluating Adaptive Hypermedia Systems

Most methods are currently used in the evaluation of adaptive systems, even though some of them, such as controlled experiments, sometimes are not properly designed and thus they do not produce significant results, the basic features that are typically subject of evaluation are usability, adaptivity and layered [3].

Evaluating Usability

A system is usable when it allows the user to achieve his task with effectiveness, efficiency and satisfaction in a given context of use.” Software is usable when the user can achieve his task with a minimum of resources required and when the system is pleasant to use [6], there are some method used for evaluating Usability like HCI oriented evaluation method, collection of user opinion, interview and questionnaire [5].

Evaluation of Adaptativity

Adaptation method can be used in the evaluation of adaptive systems targets the different aspects of adaptation include the Content like fragment addition/removal (conditional inclusion of fragments), fragment’s level-of-detail support, fragment generation, fragment annotation, Navigation like Direct guidance, link sorting, link hiding, link removal, link disabling, and link annotation and Presentation there are three different presentation adaptation: presentation adaptation based on the user model in which the system decides how to present certain components to the user, based on the user model presentation adaptation based on environment where external environment can change the presentation format presentation adaptation based on technology, not all kinds of media or graphical elements can be used on all kinds of client machines [9].

Evaluation of SQLCourse

This website is an adaptive educational hypermedia website, allows students to learn the database concepts online.
The Results

In study we discussed the evaluation of an adaptive hypermedia system called the SQL Course using the checklist technique by monitoring and usage and questionnaire contain 27 closed questions and I got the following result.

Table (1) explain the adaptive presentations

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<thead>
<tr>
<th>SQLCourse</th>
<th>Adaptive multimedia presentation</th>
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Table (2) explain the adaptive navigations technique

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<th>SQLCourse</th>
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Questionnaire

I used the questionnaire to evaluate the adaptive educational system called SQLCourse consist of 27 questions targeting 30 students from Master of Computer science and information systems program in University of Science and Technology contain fourth factors.
First factor is Naturalness contain eighth questions, it used to measured the natural of adaptive hypermedia systems, second factor is supportiveness (user support) provided by the systems contain six questions, it is used to evaluate the interaction between users and the adaptive hypermedia systems, third factor is consistency of adaptive hypermedia systems contain six questions consistency and design of the adaptive hypermedia systems, and the last factor is navigation usability that contain seven questions to measured the users navigations in adaptive educational hypermedia systems, and I got the result showed in the following chart.

![Mean](image)

Figure (1) means of the all factors used in evaluations

- **Mean**: the average of all factors that used to evaluate the SQLCourse

**Conclusions**

The evaluation of various adaptive features on the Website has provided feedback from the users, overall, users welcomed the various navigational support features built into the website, the use site map significantly to improve the students' learning performance and reduced the time and navigation steps required compared with free browsing, users' opinions revealed that they like the personalized features that are integrated into the Website, particularly the personalized site map which used the history-based link annotation, however, from the opinions, there is no evidence to show that the integration of the personalization features has improved learning or facilitated the
learning process except to reduce the number of navigational steps, this might be due to the inaccurate system adaptation decision-making.

In this paper we have presented the adaptive hypermedia works, classifications and methods used to an evaluation, we carried out of educational adaptive website called SQLCourse; in this section we summarize our main finding interactions with SQLCourse and at methodologies issues for the evaluations like usability, human computer interactions and layered evaluations approaches, interesting user requirements for educational adaptive systems emerged from the questionnaire and checklist to evaluations the usability, human computer interactions and other technique applied on SQLCourse by monitoring and usage.

References

[5] Michael V. Yudelson, PROVIDING SERVICE-BASED PERSONALIZATION IN AN ADAPTIVE HYPERMEDIA SYSTEM.