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Personalized WebQuest-Based Learning In EFL's Students of Higher Education

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Keywords:

WebQuest learning technologies, personalizing, English as a foreign language, Analytical descriptive

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ABSTRACT

This research was conducted to investigate personalized WebQuest-based learning in EFL students of higher education by applying the method of documentary data mining research, therefore organized in the framework of analytical descriptive studies. Based on the investigation of the available data in the field of personalized WebQuest-based learning, This article provided clear guidance on the initial studies of the integration of adaptive educational hypermedia methods as well as personalization approaches of web-based teaching-learning platforms in EFL students and preliminaries of the work to identify the personalization field of WebQuest-based learning. The results indicated that while many researches have been conducted in the field of WebQuest-based learning in English as a foreign language and the development of WebQuest technologies in the education of EFL students of higher education is undeniable, Specific studies have not been conducted in the personalization of WebQuest learning approaches and more studies are needed to identify the area of integration of adaptive personalization procedures and WebQuest learning methods. Field studies in the territory of this type of web-based learning dimensions can provide the basis for the realization of valuable achievements to guide researchers and English language students in designing and compiling personalized WebQuest learning-teaching packages.

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Introduction

Knowledge of different languages is beneficial, and it allows individuals to have a broader perspective when looking at the world and its various cultures. Learning English as a second language involves acquiring it in addition to one's native language. In today's society, the internet plays a significant role, including in the English language. Therefore, learning English through online platforms can be seen as an alternative method. The advancement of web-based technologies and strong internet connections offer new possibilities for educational technology. Web-based learning has become a prominent application of the internet. Traditionally, distance education was delivered through technological methods such as videotapes, internet, satellite broadcasts, videoconferencing, TV broadcasts, etc(Cavus, 2007). In 1996, approximately 1 million students participated in web-based higher education courses, with a projected increase to 3 million by 2000(Edelson, 1998). Recent studies indicate that educational institutions are increasingly adopting new technologies and software to enhance instruction. The use of information and communication technologies (ICTs) is often justified by their positive impact on learning. However, recent research suggests that there is still a challenge in finding the balance between computer use and learning outcomes.

The World Wide Web(WWW) is a popular and widely used internet tool that serves as a communication facilitator. It allows for powerful interaction through various means (such as group conferencing, email, and internet relay chat) that enable learners to communicate with teachers, peers, and experts, as well as collaborate on projects(Mioduser et al., 2000). Additionally, the web serves as a platform for delivering instructional materials, with numerous websites offering digital educational activities and network-based courses for students of all ages and in various subjects. Web-based learning is a significant medium for designing and delivering content, as it caters to different learning strategies(Khan and Vega, 1997). In web-based learning, learners are typically responsible for their learning process and outcomes(Reeves and Reeves, 1997). This gives them the freedom to access educational resources from anywhere in the world at any time.

The scope of applications to which computers have been Settled in the service of language teaching and learning is noticeable. Learners could learn vocabulary and grammar from basic keyboard-input schemes; they can reach video and sound on CD-ROM; also students can record their voices and compare their pronunciation with that of a native speaker; they can apply word-processing schemes such as WordPerfect to editing and writing exercises, or presentation schemes encyclopedias, thesauri, dictionaries and the resources of the Web to aid them. Many such systems endeavor to serve Students interacting with the learning source at diverse chronological times. Web-based learning, then, is often ascribed to as those delivery modalities that seek to decrease the obstacles of space and time to learning, therefore the frequently used phrase 'anywhere, anytime learning'. A Learning Management System(LMS) also is known as a software system to presents web-based education. A Learning Management System provides the platform for the web-based learning environment by delivering, and tracking learning and also enabling the management, Learning Management Systems are often examined as being the starting point of any web-based learning scheme(Sarica & Cavus, 2008).

Almost 20 years before the advent of the Web 2.0 principles, web-based educational systems were naturally accommodated by adaptive hypermedia, an alternative to the "one-size-fits-all" procedure in the realization of web-based systems, which terminated in the territory of adaptive educational hypermedia(Beaumont, 1995). Adaptive educational hypermedia was one of the first and most well-known adaptive hypermedia applications(Brusilovsky, 2004a). The educational territory is a domain ideally appropriate for personalization as each student has an individual learning mode, she is interested in diverse subjects, she has diverse learning progress, etc. Therefore it is beneficial to adapt to each student individually as human instructors often do. Personalized educational web-based system can tailor the presentation as well as underlying pedagogical patterns leading to adaptive content and navigation to make the learning process more effective for the student.

Adaptive web-based educational structures follow intelligent tutoring structures with a long tradition. Intelligent tutoring systems support a student in the learning process, especially in solving duties providing assistance on each step(or even offering these steps). Educational web-based systems are more centered towards the notion and offer

the student with linked content employing different forms of recommendations. Recommendations are recognized often by link and content annotating, link sorting, or leading the student while navigating the content(Brusilovsky, 200b; Velart & Saloun, 2006). Several systems are centered towards a specialized sort of content, e.g. exercises(Barla et al., 2010) or scheme examples(Brusilovsky & Yudelson, 2008). To present a personalized learning experience, any educational web-based system (as any other system executing a personalization) should comprise a set of components realizing the actual personalization, i.e. the adaptation to a specific user (student, learner). On the other hand, Webquest has been developed as an adaptive educational hypermedia in the last three decades.

The WebQuest notion was spearheaded by Dr. Bernie Dodge and his student Tom March in 1995 to assist instructors in combining technology into their classrooms. Dodge distinguished WebQuest technology as "an inquiry-oriented practice in which some or all of the data that students collaborate with comes from resources on the Internet, optionally supplemented with videoconferencing" (Dodge, 1997). In simple words, a WebQuest is a web-based lesson constructed by the teacher. Thus, In this paper, the author attempted to investigate the personalized WebQuest-based learning technology. According to this, Figure 1 shows the conceptual model of the research.

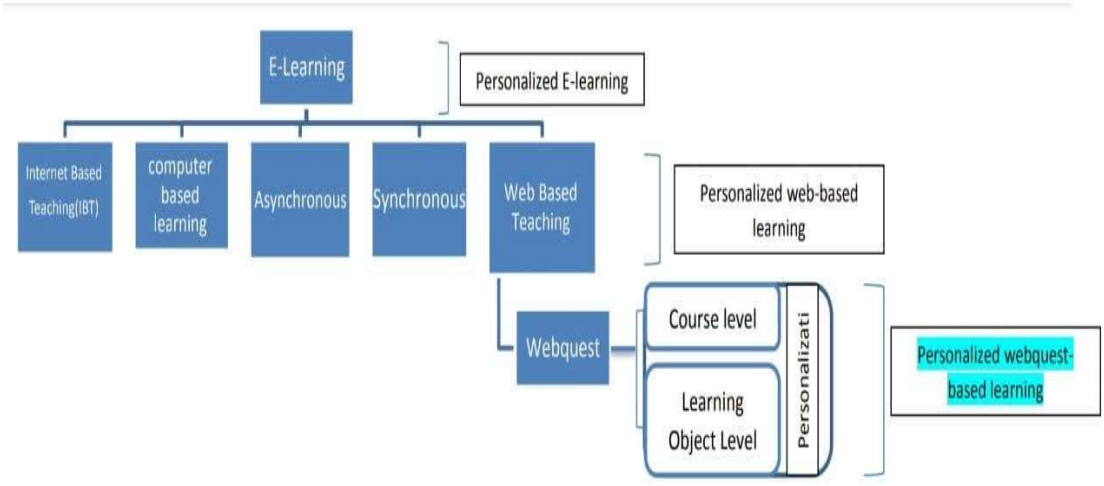

Figure 1. *Conceptual model of personalized WebQuest-based learning(adapted from Aslanyan-rad, Ghaderi & Yadegarzadeh, 2023)*

Research Methodology

The current research was conducted to investigate "Personalized WebQuest-based learning in EFL's students of higher education" by using the documentary data mining research method, therefore it was organized in the category of descriptive-analytical research. The research field included library resources and the most recent studies in the territory of personalized WebQuest curriculum as the focal and main phenomenon of the research.

Need for personalization

As the popularity of the notion of e-learning has enhanced, web-based learning is revealed to have become the basis of higher education in most nations. The application of web-based learning has become widespread as a means of delivery of instruction. Because the Internet and Web environments have turned into significant platforms for the delivery and sharing of instructional practices and experiences, the term 'personalization' has emerged, based on the theories pertinent to individual diversity. Learners have individual differences such as cognitive styles, learning styles, studying habits, media preferences, background information, abilities, motivation, expectations, and time needed to learn. Therefore, students should be encountered as individuals rather than as an analogous group in web-based learning environments. The essence of personalization in web-based learning has also been summarised by The Personalization Consortium as thus: '(1) encourage learners to learn by anticipating needs; (2) make the interaction efficient and satisfying for both the organization and the participants; and (3) build a relationship that stimulates learners to return for consistent and progressive learning' (in Apple & Horace, 2006, p. 49). Indeed, E-learning requires new considerations in course content, content organization, construction of new resources, and definition of new roles, especially for both learners and instructors (Abel et al.,2004).

Because of this, the web-based learning opportunities provided should include such individually shaped delivery of instruction and materials. Thus, personalization is an important term in web-based learning, because it avoids the 'one-size-fits-all' mentality and provides learners with individual learning experiences as a key to success, which is an important aim of web-based learning (Brown, Cristea, Stewart & Brailsford, 2005;

Henze, Dolog & Nejdl, 2004). In addition, 'the goal of personalized e-learning was to support e-learning content, activities, and collaboration, adapted to the specific needs and preferences of the learner and was built on sound pedagogic strategies' (Dagger, Wade & Conlan, 2005, p. 9). In short, personalization is the marriage of technology with pedagogy; therefore, technology should be shaped through pedagogical approaches.

Adaptive hypermedia and adaptable hypermedia

The necessity of personalisation in web-based learning necessitates researchers making use of techniques of Adaptive Hypertext, (Brusilovsky, 2001). The personalization of the system for each learner is rendered in the adaptivity of the system. Adaptive Hypermedia offers both personalized content and navigation support to provide various choices for individuals. To provide distinctive learning choices, the system should model the users according to diverse aspects.

Thus, adaptive hypermedia systems(AHS) are based on user modeling. The concept of 'adaptation' is questionable. Many approaches to user modeling and adaptation features have been suggested and implemented in personalized learning in recent years. These approaches have tried to strengthen the connection between the user, task, learning content, and the technical features of the system. Thus, two terms have emerged as a result of the above-mentioned research studies: adaptable and adaptive. If the user starts to control or make decisions about his or her actions in learning activities, then the system is said to be adaptable. On the other hand, if the system initiates control and makes decisions about adaptability, then the system is said to be adaptive (De Bra, Houben & Wu, 1999). Alatalo and Peräaho (2001) suggested that these processes are 'adapting to difference' (to different users, which is the focus here) and 'adapting to change' (changes in the whole system through time), which brings a different perspective to the same phenomenon. Thus, the level of 'adaptation' can be changed both between and within the systems, which may be facilitated by both users and systems.

Although the ultimate goal of any adaptive educational hypermedia(AEH) is to organize a perfect match between the user and the task by utilizing a common set of learning resources and guidelines, the level and type of adaptivity used to handle the

organization of such a system has not yet been standardized with commonly agreed design approaches. Moreover, 'the criteria needed to be used for setting pedagogically effective rules are poorly understood' (Brown et al, 2005). These extensive and different attributes characterizing the process of adaptivity can be designated as adaptivity constituents, determinants, rules, and goals. As described by Karagiannidis, Stephanidis, and Koumpis(1995), adaptivity constituents address the aspects of the interaction that are adapted, such as presentation, content, and information primitives. Second, adaptivity determinants comprise the factors leading the adaptivity process, namely adaptivity according to user characteristics, duty, or use nature. Adaptivity goals stand for the particular objectives that are to be served by the adaptivity process: the optimizing of efficiency or effectiveness. Lastly, adaptivity rules manage the instantiation of the adaptivity constituents, based on the state of the adaptivity determinants. Even though a standard has been set for specific characteristics, the priority of these characteristics may still differ because the decision-makers still have individual differences between them. 'To reach a high stage of adaptivity, the platforms need a high level of detail. Any model which is used as the basis for the learner or content will need to be augmented to support the level of adaptivity' (Brady, Conlan & Wade, 2004, p. 236).

In general, the approach for personalized web-based learning is to perform adaptivity of the content presentation strategy based on the user's learning style, personal preferences, prior knowledge, etc. The pedagogical considerations in some of the implementations are either completely absent or weakly applied. On the other hand, in systems where pedagogy already exists, it is really difficult to reuse the same pedagogy or apply different pedagogies to the same adaptive content. Thus, such attempts result in static courses rather than dynamic ones. To the achievement of individuals, Pedagogy is fundamental, which in turn means the overall success of a course. Hence, adaptivity should primarily address the suitable option and application of pedagogical strategy(s) (Dagger, Wade & Conlan, 2004).

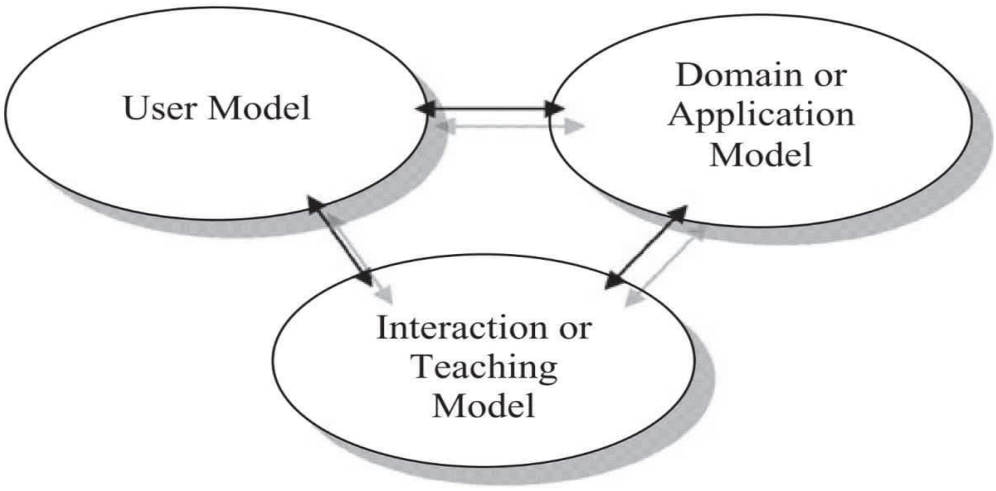

Figure 2. *Architecture of an adaptive educational hypermedia*

One of the media that plays a decisive role in personalizing the teaching-learning processes and interactions of English language students is WebQuest. As one of the methods of exploratory learning on the web, this technology fulfills a very high level of adaptability and consistency in personalized English language learning and promotes the field of personalized E-learning environments. In the following, the author will explain the characteristics of WebQuest technologies as a suitable platform for personalizing the English language teaching approach on the web, and finally, he will review its findings for English language pre-service teachers at the higher education level.

WebQuest as a suitable platform for Personalization

WebQuest technologies are practices in which all the research resources or a large percentage are assembled from the World Wide Web(Dodge, 1997). In recent years, WebQuest technologies have been widely used in educational practices(Oksüz & Uça, 2010). Firstly, the notion was ameliorated by Dodge(1995) and then enriched and diversified by March(1998). WebQuest technology generally comprises 6 stages: introduction, task, process, resources, evaluation, and conclusion. In the introduction part, a general understanding of a subject is prepared for the students. In the task part, the things that need to be carried out are mostly defined by students. In the information

sources part, the sources that students will require to finish the duties are prepared for them. These resources are ones that students could commonly access via the Internet platform. In the process part, the steps that students must follow step by step are described. In the evaluation part, the evaluation criteria are provided for the studies of learners. Finally, in the conclusion part, a summary of the experience of the students is comprised(Dodge, 1997). WebQuest technologies are in two sorts: short-term WebQuest technology and long-term WebQuest technology. Short-term ones are finished within 1-3 courses (maximum three 45-minute class periods and minimum 45-minute class period); They can be applied fast and are easier to design. The long-term WebQuest technology may last between 1 month and a week and they are mostly carried out as group practices(Dodge, 1997; Watson, 1999). This sort of WebQuest offers to analyze in depth the notions(Watson, 1999). The WebQuests in most papers are usually an instance of short-term WebQuest technologies. Since Web-based teaching and learning activities enhance the motivation and academic success of the learners(Arıkan, 2006; Çetin, 2010; Hayes & Billy, 2003), both sorts of WebQuest technologies can be applied in courses. WebQuests are inquiry-centered practices and facilitate learners' freedom to learn through diverse resources (Beane, 1997). Moreover, WebQuests permit learners to spread their problem-solving abilities, high-level creativeness, and critical thinking(Abu-Elwan, 2007; Lim & Hernandez, 2007). WebQuest technologies are more effective in upper cognitive thinking than some other practices(Kanuka, Rourke, & Lafiamme, 2007). Learners apply the Internet in an enjoyable procedure and enhance their attitude towards the courses positively via WebQuest practices(Kurtuluş & Kılıç, 2009). WebQuest practice has a high potential to serve as a productive tool in learning and teaching(Laborda, 2009; Alshumaimeri, & Almasri, 2012) and create a positive learning environment (Chang, Chen, & Hsua, 2011; Alias, DeWitt, & Siraj, 2014; Göktepe, 2014). Based on the results of Alias, DeWitt, and Siraj's studies (2014), WebQuest technologies deliver learners with opportunities to learn by their learning mode. It assists learners in the notion of abstract physics subjects. Topology is quite an abstract science and hard to comprehend topological notions. WebQuest practices can be used for teaching its notions.

WebQuest technologies concentrated on elementary school learners and pre-service instructors for diverse branches were examined in this study. Gaskill, McNulty, and

Brooks(2006) expressed that WebQuest technologies were appropriate activities concerning the philosophy and goals of constructivism theory. In this study, it is concluded that both instructors and learners enjoy courses that are conducted by applying WebQuest technologies. Kurtuluş(2009) carried out a web-based teaching practice with middle school learners and provided a WebQuest that could be used in geometry courses. Göktepe(2014) reported a WebQuest technology sample that introduced the coordinate structure to middle school learners in her investigation. WebQuest technologies are also widely applied to spread teachers' professional jobs (Lim, 2001), effective types of equipment for training teachers (Halat & Jakubowski, 2001; King, 2003; Halat, 2008) and WebQuest technology platform have been used in pre-service teacher training(e.g., Dobson, 2003; King, 2003). Design a WebQuest practice may prepare pre-service instructors to understand "technology's affordances, contextual sensitivity, constraints, and manipulability" (Mishra & Koehler, 2003) and incorporate technology into their future education process (Kundu & Bain, 2006). WebQuest technologies are effective equipment for preparing teachers with the chance to incorporate the Internet into their courses (Beane, 1997). Stathopoulou, Katarinou, and Chavioris(2010) noted that WebQuests would be beneficial for teachers in enabling them to consider the relationship between culture and mathematics.

WebQuest practices for student teachers are available (e.g., Allan & Street, 2007; Gülbahar, Madran, & Kalelioğlu, 2010; Kurtuluş, Ada, & Yanık, 2014; Peker & Halat, 2009; Halat & Jakubowski, 2001; Iskeceli-Tunç & Oner, 2014; Halat, 2007; Halat, 2008; Halat & Peker, 2011). Iskeceli-Tunç and Oner(2014) investigated the application of WebQuest technologies designed for the professional development of instructors. They expressed that WebQuests offer progress not only for technological abilities but also for the pedagogical abilities of instructors. Halat(2008) investigated the effects of WebQuest technologies on the geometrical thinking stages of pre-service teachers and discovered that they had a positive effect. Halat and Peker(2011) analyzed the effects of WebQuest technology and worksheets on the motivation of student primary instructors. It was concluded that WebQuest has a positive effect on the motivation of student teachers. The high and middle school pre-service mathematics instructors who participated in the studies of Halat and Jakubowski(2001) expressed that they would apply the WebQuest technology in their future schools if technological resources were

available for this goal. Halat(2007) expressed in his investigation carried out with primary instructors that WebQuest technologies enhanced the desire of instructors to learn more about new mathematical notions and topics, but did not significantly affect their knowledge stage. Halat(2007), concerning the application of WebQuest technologies in teaching mathematics, presented the fact that 94% of the pre-service instructors believed that WebQuest technologies could be used as visual content in the lessons. While 55% of the participants expressed that WebQuest technologies affected their mathematical knowledge, 19% expressed that they did not have a positive impact personally. The studies of Wang and Hannafin(2008) dealt with the issue of incorporating WebQuest technologies into the education of pre-service instructors. They concluded that WebQuest technologies can be used in teacher's education to increase their skill in integrating technology. In their studies, Yang, Tzuo, and Komana(2011) investigated WebQuest and cooperative learning for instructor training goals in Singapore. They prepared a WebQuest provided for pre-service special education teachers.

Peker and Halat(2009) analyzed 73 pre-service instructors in their experimental studies in which they compared the courses conducted by applying WebQuest technologies and computer software; they concluded that practices with WebQuest technologies decreased the anxiety of teaching mathematics. In the investigation of Kurtuluş, Ada, and Yanık(2014) a study of the opinions of a middle-school mathematics teacher was carried out who applied a WebQuest practice for the first time in his lessons regarding the practicability of WebQuest technologies. The provided activity concerned the topic of the histogram. It was concluded that WebQuest technologies perpetuate the learner's motivation and enhance students' confidence in mathematics.

Aslanyan-rad, Ghaderi & Yadegarzadeh(2023) in research titled "Application of WebQuest in teaching third-grade elementary science" using the targeted framework of Strauss and Corbin's contextual theory obtained eight main themes, as "educational resources", "human resources", "functional resources", "theoretical resources", "technological resources", "organizational resources", "metacognitive resources" and "Structural resources". Finally, the qualitative model of the research was arranged in the form of a paradigm model consisting of the main and sub-categories of the research around the axis of the main phenomenon of the research, i.e. WebQuest, and finally, the

conceptual model of the research was drawn according to the paradigm model of the research. Aslanyan-rad & Ghaderi(2023) in research aimed at the application WebQuest in learning English showed that the analysis of the extracted documents emphasized 21 basic axes and 5 sub-organizing categories, among the 21 identified themes, the categories "Learning based on information and communication technology", "Effectiveness of WebQuest in writing skills" and " "Effectiveness of WebQuest in reading skills" obtained the highest percentage of subject superiority. The researcher developed these basic axes in a process of conceptual construction and payment using the systematic coding of Strauss and Corbin in five sections "English language learning skills", "functional aspects of English language learning", "tactical aspects of English language learning", "cognitive skills" & "theoretical factors" and organized around the main phenomenon of the research, i.e. the application of WebQuest in English language learning.

The architecture of personalized WebQuest as an AEH

From an alternative perspective, an adaptive system does have a model on which its interaction patterns are based. An adaptive system includes three models: the user model, the domain/application model, and the interaction/teaching model as seen in Figure 2 (De Bra et al, 1999; Pena, Marzo & De la Rosa, 2004).

- The user model is used to organize the system based on the given or inferred user characteristics. This model provides adaptivity either by intervention or by collaboration with the user. User characteristics may converge under two groups defined as the psychological model and the profile model, which form the basis for building a user model. Thus, the user model allows the system to personalize the interaction between the user and the content by adapting the content according to user characteristics.
- The domain/application model forms the basis of all the inferences and predictions through the interaction between the user and the system. Moreover, the domain model also forms the basis for all adaptations that the system performs according to the data provided by the user. Hence, it is the description of the design of the features in the application relevant to the expectations of the system.

- The interaction/teaching model organizes interaction between the user and the application. Data that are gathered during user interactions with the application may be used to make inferences about the user, evaluate its inferences and adaptations, and adjust the adaptation mechanisms according to the user or some other criteria.

This model also forms the basis of teaching activities aligned with pedagogical rules. Although the stage of design dimensions for AEH systems may diversify, the main elements remain the same. Under these main headings, different researchers consider different aspects such as the context of use, content domain, instructional strategy, instructional view, learner model, user rules, adaptation model, and detection mechanism (Cristea & De Mooij, 2003; Garzotto & Cristea, 2004).

Adaptation issues in WebQuest-based educational systems

In the field of adaptative hypermedia, adaptation technologies are generally divided into two groups. As first put forward by Brusilovsky(1998) and later retitled by De Bra et al(1999), the focus was on the content (presentation) and link (navigation) in web-based environments. From differ according to the user. From the perspective of navigation, adaptation refers to the organization of details and visibility of the links.

Because personalization implies preparing many versions of the content addressing the same learning outcome, the use of various strategies is required. Furthermore, these strategies should be shaped in a way that they can be reused and adapted for different contexts. This phenomenon brings us to the point that adaptation strategies should also have adaptability properties. However, when we look at the literature, we see varying design approaches. Thomson (2005) put forth a set of design goals for personalization, which was grouped into four themes: functionality, privacy, usability, and performance.

While stating that available approaches and even the adaptive hypermedia scheme approach do not scaffold the modeling of adaptivity dependencies in terms of specification of material and functionality, Alatalo & Peräaho (2001) proposed a method in which they incorporated adaptivity into the structure of the system by contemplating some objects as adaptors and spreading heuristics which were according to the material and functionality. Similarly, underlining the need in educational experiences for offering not only tailored content but also tailored activities through

interaction, Conlan et al. (2007) described a multimodel approach, in that they integrated the areas of 'Personalized Learning Content' and 'Adaptive Web Service Composition' to deliver the distance learning solution. Rossi, Schwabe, Danculovic, and Miaton (2001) prepared four models of personalization in their research investigation, which were described as Link Personalization, Content Personalization, Remote Personalization, and Structure Personalization. They expressed that their classification provides a rather coarse granularity, which can eventually be refined in precise uses and the sorts of personalization generally discovered in successful Web applications.

To address the need for simple pedagogically based approaches in the composition of adaptive courses, Dagger et al. (2005) put forward an adaptive course construction methodology in which they enhanced the e-learning syllabus and design activities by the use of adaptivity definition, subject matter concept modeling, adaptivity technique selection, and alternative instructional design template customization. For analyzing user modeling in adaptive hypermedia educational systems, Martins et al. (2008) proposed that 'the analysis, application, implementation, integration, and evaluation of techniques used to adapt the presentation and navigation in educational AHS, using metadata for the learning objects and user modeling, etc, will contribute to the value for the implementation of e-learning in diverse academics institution, in a way to make the educational process more adaptive and capable to prepare future professionals' (p. 205).

During the adaptation of WebQuest-based educational systems, some problems may appear. Investigations into the personalization of WebQuest-based learning revealed that there are several obstacles to developing more effective adaptive systems. As stated by Brusilovsky (2003) and Aroyo & Dicheva (2004), possible obstacles are listed as,

- low reusability of learning objects between systems.
- lack of ontology to describe knowledge domains.
- low interoperability between systems.
- lack of theoretical underpinnings for developed systems.
- low reusability of adaptive and pedagogical techniques.

Conclusion

The results indicated that while many researches have been conducted in the field of WebQuest-based learning in English as a foreign language and the development of WebQuest technologies in the education of English foreign language students of higher education is undeniable, Specific studies have not been conducted in the personalization of WebQuest learning approaches and more studies are needed to identify the area of integration of adaptive personalization procedures and WebQuest learning methods. Field studies in the territory of this type of web-based learning dimensions can provide the basis for the realization of valuable achievements to guide researchers and English language students in designing and compiling personalized WebQuest learning-teaching packages.

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