

Pedagogical Usability Checklist for ESL/EFL E-learning Websites

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Abstract

The purpose of the present paper is to provide usability guidelines for ESL/EFL E-learning websites. Although there are a myriad of ESL/EFL websites available online, guidelines to designing and evaluating them with pedagogical considerations are still rarely found. By taking into account various curriculum theories, instructional design theories and learning theories, this paper proposes a checklist for ESL/EFL E-learning pedagogical usability.

Instructors and web developers, on the one hand, can use this checklist as guidance when designing an ESL/EFL E-learning website. Learners, on the other hand, can utilize this checklist when evaluating and selecting a site for their purposes of learning and needs.

1. Introduction

The rapid development of the networked computer in recent years has brought at least two changes to language teaching. Firstly, a great many documents are produced and distributed in English on the Internet everyday, which, in turn, has speeded up the role of English as a global language in many fields both online and offline. Secondly, the capability of the networked computer opened up new opportunities of learning English. Traditionally, for most of English as a Second Language (ESL)/English as a Foreign Language (EFL) learners, learning English was limited to classroom experiences, mainly depending on classroom teachers and textbooks. Now, networked computers allow an array of possibilities to second/foreign language learners to obtain more authentic and updated learning materials, directly engage with people in the target culture, and learn with multimedia. Despite some limitations of learning on and with computers, technology offers a great learning opportunity to ESL/EFL learners.

It is, thus, not surprising that English education has gained more attention than ever and there also has been a growing amount of interest in learning English online. Although there are a good number of ESL/EFL E-learning websites available, many of them are poorly designed technologically and/or pedagogically. It is true that technology, such as human-computer interaction (HCI) and computer-mediated communication (CMC) tools, has a great impact on E-learning; however, without appropriate pedagogy, learning outcomes are, ipso facto, limited in online ESL/EFL learning.

The purpose of the present paper is to provide usability guidelines for ESL/EFL E-learning websites. Although there are a myriad of studies on general usability, systematic and theoretical usability checklists for E-learning websites grounded in pedagogy are still poor. By taking into account both general usability and pedagogical usability, this paper proposes guidelines to optimize online learning environments to maximize student learning.

In Section 2, the definitions and distinction of general usability and pedagogical usability will be addressed with a brief description of previous studies. Section 3 will describe curriculum theories, instructional design theories, major learning theories and SLL theories which establish a theoretical ground for pedagogical usability in this paper. In the following section, the complex relationship among the components of online ESL/EFL sites will be illustrated. A pedagogical usability checklist will also be presented. Lastly, limitations of this study and suggestions for future study will be discussed in the conclusion.

The checklist has been developed with three audiences in mind: instructors, web developers, and users. The purpose for instructors and web developers is to provide both technical and pedagogical usability guidance for them when designing an EFL/ESL learning site. Users, both learners and classroom

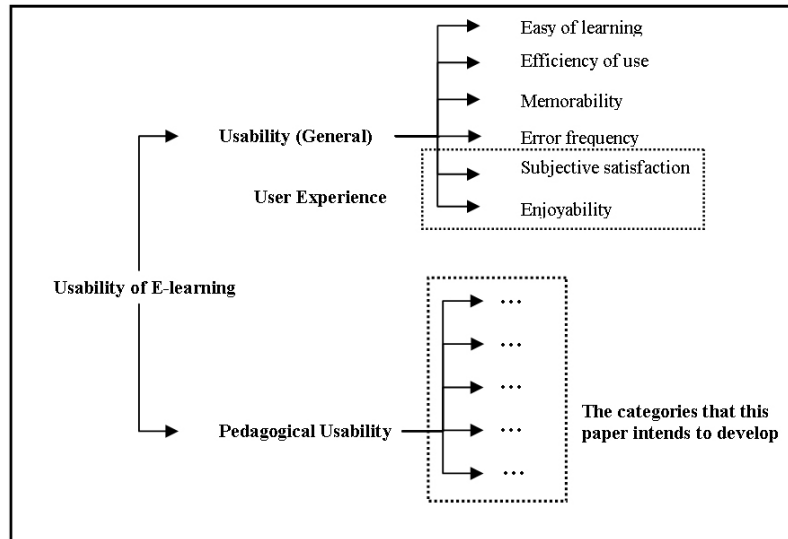


Figure 1. Usability Property of E-learning Website

teachers, also can utilize this checklist as guidelines when selecting and evaluating online EFL sites for their purpose of learning.

2. General Usability and Pedagogical Usability

For the purposes of this paper, the general concept of usability is further divided into two categories in this paper; general usability and pedagogical usability. General usability focuses mostly on user interface, i.e., technical usability between computers and users. In general, usability is the extent to which a product or a system enables users to achieve specified goals. Usability is the ability of a product or system to effectively and efficiently fulfill the needs and specifications of users. Usability is essential to user satisfaction and user acceptance of a product or system. It is the measure of the quality of the user's experience when interacting with a product or system [1]. General usability, thus, encompasses the design qualities that affect the user's experience with the website, as shown in Figure 1.: ease of learning, efficiency of use, memorability, error frequency, subjective satisfaction, and enjoyability. General usability, in turn, affects learner control in learning in terms of pace, path, instructional difficulties, and feedback [2].

However, general usability is not enough to evaluate specific websites such as those dedicated to E-learning. Nielsen remarked that although general

usability standards apply equally to all sites, including E-learning, there are additional considerations for E-learning sites, e.g., the need to keep content fresh in learners' minds so that they do not forget things while trying to accommodate new concepts [3]. Since technology is not inherently educational in terms of purposes or goals, evaluating general usability is not enough to design effective ESL/EFL E-learning sites as well as to evaluate them [4]. Moreover, efficiency, more or less related to technical usability, does not necessarily contribute to the effectiveness of an E-learning site and lead to positive learning outcomes [5]. As online learning sites have been playing a more important role in ESL/EFL, it is urgent to propose a reliable guideline grounded on learning theories and pedagogy to check the educational philosophy and the pedagogical design of the website. Whereas a number of research studies have been conducted to examine, test, evaluate, and guide general usability, studies on pedagogical usability are rarely found [5-7]. Pedagogical usability can be used to denote "whether the tools, content, interface and tasks of the web-based learning environments support various learners to learn in various learning contexts according to selected pedagogical objectives"[8]. Pedagogical usability, therefore, should concern more on pedagogical aspects, such as the learning process, purposes of learning, content, user's needs and learning experience, and learning outcomes. Taking this into account, the following section will present a pedagogical usability checklist.

Table 1. Learning theories and SLL theories

Learning Theories	View of learning	Main characteristics in learning	Focal characteristics in SSL	Roles of computers	E-learning applications
Behaviorism	Learning as transmission of knowledge	habit formation focus on product	Prescriptive norm Imitation of NS Focus on form Formal accuracy From parts to whole	Tutorial	Providing concrete exercises Drill-practice, corrective feedback
Cognitivism	Learning as mental/cognitive change and representation, as cognitive processing	Innate ability Focus on individual learners	Comprehensible input, development of communicative and learning strategies SSL as the acquisition of a complex cognitive skill	Tutor	Providing comprehensible input
Constructivism	Learning as social construction through interactions	Interaction and collaboration with others, discourse community, authentic context, scaffolding, learner-centered	SSL as a socially constructed phenomenon	Tool-kit Authentic learning context and environment	Providing authentic social discourse environments, (language situation) & discourse community, authentic tasks & activities

3. Grounded Theories and Methodology

To develop a robust checklist of ESL/EFL E-learning websites, various theories are taken into consideration; curriculum theories, instructional design theories, learning theories, and second language learning (SLL) theories. Curriculum theories, on the one hand, relate to what to teach in the domain concerned. Curriculum theories help instructors generate clear and specific goals and objectives of learning. A sound curriculum theory also includes the consideration of the national standards, the social context and learning environment around the learners [9]. Instructional design theories (IDT), on the other hand, concern how to teach, that is, what the instruction should be like and what teaching methods should be employed to maximize student learning in the domain [10].

In addition to curriculum theories and IDT, it is necessary to understand learning theories and SLL theories in order to connect learning mechanisms, teaching principles, teaching methods, and practices to online SLL. Without understanding how learning occurs, specifically how learners acquire a second/foreign language, mere use of technology for its own sake is unlikely to result in a pedagogically effective ESL/EFL E-learning website [4].

As a result of the development of educational psychology and the learning theories derived from, there have been numerous controversies within SLL concerning ways that languages are most effectively taught. The consequent changes in SLL theories can be summarized in three major theoretical perspectives; the structural perspective grounded on behaviorism, the cognitive perspective, and the constructivist perspective. Each perspective values different aspects of the process of SLL, and favors different teaching methods, instruction, and classroom dynamics. For instance, structural language teaching perspectives viewed SLL as habit formation and embodied a systematic approach to learning content according to the learning objectives. Practice and drilling were the most popular teaching/learning techniques developed from this perspective.

On the other hand, the cognitive perspective defines SLL as a cognitive process of generating and transforming knowledge. Cognitivists view a certain degree of learner control as an essential aspect of an effective learning environment [11]. In cognitive learning theories, the most important areas to be considered in online learning sites are perception and attention, memory, comprehension, active learning,

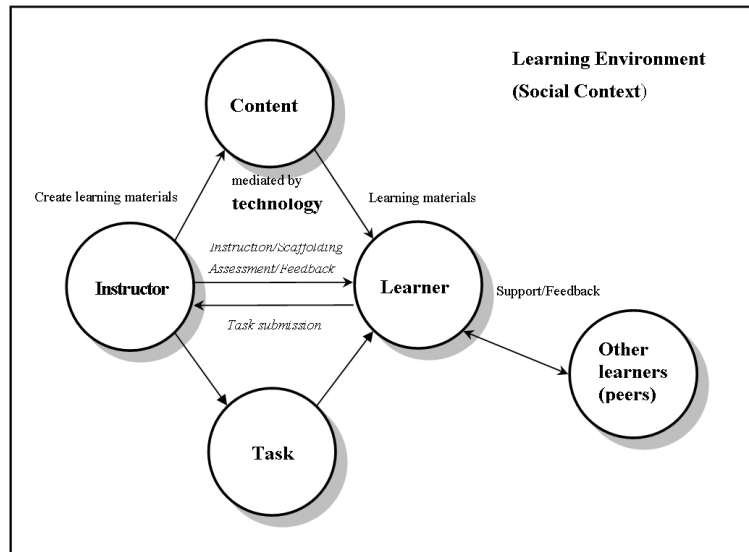


Figure 3. The Relationships among Components

motivation, locus of control, transfer of learning, and individual difference [12]. In terms of SLL, the cognitive perspective values communicative competence and negotiation of meaning, and SLL instruction emphasizes learners' development of a variety of cognitive strategies and the provision of comprehensible input to learners.

Most recently, the constructive perspective has gained popularity. From this perspective, learning is not just a private and individual activity happening in one's head, but rather a socially constructed phenomenon occurring through social interactions. Hence, knowledge is viewed as constructed through interactions with others, rather than learned only by one's cognitive functions. The constructivist perspective emphasizes an information-rich and socially meaningful learning environment, in which a variety of interaction, communication, and collaboration can take place, so that language instruction can help learners function in an authentic social discourse community outside classrooms, beyond providing comprehensible input [13]. (These three learning theories are summarized in Table 1.)

As both SLL theories and technology has developed, computer-assisted language learning (CALL) also has evolved. Without a doubt, a different SLL theory will lead to a different use of computers, such as Crook's metaphor, computer-as-tutor, computer-as-pupil and computer-as-tool [14]. In other words, based on their epistemological understanding of learning, online instructional designers will set up different learning purposes and goals and use a different instructional design,

methods, and media, which, in turn, will determine a different teaching practice and bring different learning experiences to learners.

While the three learning theories are usually considered incompatible with one another, these perspectives are not necessarily exclusive to each other. On the contrary, all these three perspectives overlap with one another in certain areas. Language learning, moreover, is a complex human activity taking place in complex human relationships, and the language learning experience is shaped by a complex interaction of social, cultural, and individual factors. Thus, there is no single best SLL theory that embraces and explains all the variables in SLL. Each SLL theory can bring certain benefits to learners. Therefore, online instructional designers need to take into account all three perspectives and apply them in accordance with learner variables and purposes of learning to optimize the learning environment online.

In sum, the methodological approach to generate the EFL E-learning checklist employed the following steps:

1. Review learning and SLL theories
2. Identify (prioritize) significant characteristics of each SLL theory which can be applicable to E-learning.
3. Examine roles of computers in CALL related to each SLL theory.
4. Examine a variety of frameworks for ESL/EFL curriculum and materials development. Also review checklists for evaluation of curricula and materials. Identify essential components of ESL/EFL learning materials.

5. Examine the instructional designs which are widely employed in EFL.
6. Draw significant characteristics of all three areas, learning theories, curriculum theories, and IDT, and narrow and apply them to an EFL E-learning pedagogical design.

As shown in Figure 2, curriculum theories, IDT, and learning theories are closely related with one another, hence, to develop a sound EFL E-learning site, all three areas should be considered.

4. Pedagogical Usability Checklist for ESL/EFL E-learning Sites

4.1 Relationship among Components in the EFL E-learning Environment

As shown in Figure 3 below, in an online learning environment, five components play central roles: instructor, learner, content, task, and technology. These five components are intertwined with one another, create a learning environment and influence learning outcomes. The content (learning materials) created by the instructor are provided to the learners (indirect interaction between the instructor and the learners mediated by learning materials). The learner then accomplishes (possibly submits) his/her project or task to the instructor. The instructor (or computers) then assesses and evaluates the task and returns feedback to the learner (direct interaction between the instructor and the learner). The learner is also connected to other learners (peers) and shares in peer support and feedback.

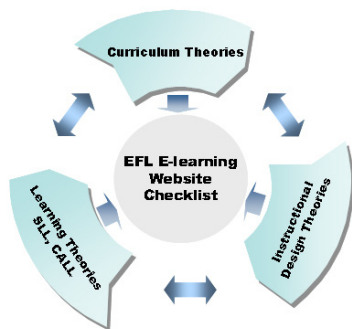


Figure 2. Three areas of theories that influence the EFL E-Learning website checklist

Inevitably, all the interactions on the E-learning website are mediated by technology. Although technology is not the central issue when designing effective ESL/EFL E-learning sites, the impact of

technology on E-learning is undeniable. Based on the relationship among the five components, the checklist proposed in this paper further develops the components into seven general categories and specific items that should be considered when designing and evaluating E-learning EFL/ESL sites.

4.2 Pedagogical Usability Checklist

As discussed elsewhere in this paper, the paradigm shift from behaviorism to cognitivism to constructivism has also brought many positive changes in the instructional designs and classroom practices, but not fully realized yet in E-learning. The checklist presented in this paper focuses on the shift from teacher-centered to learner centered, from passive to active, from solitary to collaborative, and from decontextualized to authentic and meaningful learning. It also values individual learner needs and variables. The checklist includes seven categories: purpose, instruction, content, tasks, learner variables, interaction, and evaluation.

First and most importantly, the **purpose** of the site should be clearly defined and described. The purpose of the site may be to promote communicative competence in English, or concentrate only on one specific area of English or preparation for tests. Furthermore, the purpose of the site also will be varied depending on whether it is used as a supplement to face-to-face classroom learning in a blended learning environment or whether it is solely online distance learning. The purpose should be practical and accommodate learner's needs.

In online learning sites, how to frame **instruction** is crucial to learners' understanding of the content knowledge. Since instructors and learners are physically separated in an online learning environment, the process of explaining and instructing is not the as same as that in classrooms ; thus, to avoid confusion and deliver the message clearly to learners, instruction should be accurate and clear. Using comprehensible vocabulary keyed to learners' levels would also help their understanding of the content and aid them in accomplishing the task. In this way instruction can reduce learners' cognitive loads while they process new information [2].

Instruction should be anchored in appropriate learning theories, present clear learning goals and objectives and address learning content according to an appropriate sequence of learning. In addition, instruction should provide scaffolding which enables the learner to start the learning activity with his/her current proficiency level and understanding, but

assist and challenge him/her to develop the higher level beyond the current stage. By providing additional resources and help, an online ESL/EFL learning site can help learners accomplish tasks beyond their current understanding.

Content should match the purpose of the site. If the site intends to enhance all four language skills, then those skills should be introduced in an integrated and balanced manner. The manner in which grammar is introduced is also important; whether it is embedded in the context or explicitly explained. In addition, since language cannot be separate from the culture in which it is used, the target culture also should be included in the content and adequately represented. The content ought to provide new and useful information, which is not easily found in other learning sites. The content should be authentic and contextualized so that learners can easily transfer it to other contexts and apply it to real-life situations. Since different delivery modes are available on computers, it is critical to select the best medium for each type of content. By doing so, a well-designed ESL/EFL E-learning site can encourage learners' development of multiple modes of representation of content knowledge.

Tasks need to be designed to reinforce the learning content with an appropriate workload, and promote self-directed, self-monitored and self-regulated learning. It is desirable to embed a wide array of different instructional methods, such as drill-and-practice, discovery, simulation, question-and-answer, instructional games, and if possible, collaborative learning in tasks, so that learners can be exposed to opportunities to utilize different learning strategies. To support learners' construction of knowledge and maintain motivation, task-based and problem-solving based learning beyond drill-and-practice is essential. Well-designed tasks can satisfy "learning by doing" and provide a hands-on learning opportunity to learners, which is usually lacking in current online learning. All the tasks should be authentic and situated in the overall learning context and also be easy to transfer to real-life situations.

Learner variables include personal information about the individual learners, cognitive domains, affective domains, and metacognitive domains, and these three domains are highly interdependent with each other. One reason for the difficulties in online learning is that it is not inherently motivating [3]. To encourage learners more motivated and engaged, different learner variables should be considered when designing an EFL E-learning website, such as age, gender, level of capabilities and previous knowledge,

different learning styles, personalities, attitudes toward the target language, degree of self-direction, anxiety level, and different learning strategies. Even though it is not feasible to satisfy all the variables of individual learners, all the variables must be taken into consideration because learners often face difficulties in online learning due to different individual characteristics. Motivation has a strong correlation with both self-directedness and self-efficacy. In other words, higher motivation leads to higher self-directed learning and higher self-efficacy, which are crucial to online learning. Not only should a good EFL E-learning website accommodate these learner variables, it should also actually enhance some of the variables. For example, when designed effectively, a site can help to heighten learner capabilities, attitudes, self-directedness, and self-efficacy in SLL, lower language learning anxiety as well as technology anxiety, and develop overall learning strategies (metacognitive skills). Development of learning strategies, in turn, can enhance self-directedness and self-efficacy in learning. Therefore, since the developmental process of learner variables is cyclic, a well-designed website can bring a synergetic effect in ESL/EFL learning.

The next category, **interaction**, is further divided into three subcategories; learner/ computers, instructor/learner, and learner/learner. Since the first type of interaction (general usability) was already illustrated earlier in this paper, only the other two types of interactions will be discussed here. This category particularly has gained more attention in online learning since constructivism emphasizes increased interaction and communication during the learning process. Yet, it is not actualized fully in online learning, partly due to technical affordance and partly due to lack of pedagogical considerations. However, it is never too much to stress the importance of social interactions in SLL. Recently, the development of information and communication technology (ICT) enables more direct interactions and dialogic communications among the participants by utilizing computer-mediated communication (CMC) channels, both synchronous and asynchronous [15]. Nonetheless, mere incorporation of CMC without pedagogical considerations will not benefit learners.

This category, when effectively realized in online learning, can bring great benefit to learners by envisioning a constructivist learning environment and adding humanistic values of learning. Through interactions between the instructor and the learner, the instructor provides instruction, support, assessment and feedback to the learner, and the

learner can ask questions and make clarifications about the content. Not only the interaction with the instructor, but also interactions among learners can facilitate learning a new language by providing support and feedback for each other. Furthermore, if communication among the participants is carried out in English, it can encourage authentic language use

for an authentic purpose and provide scaffolding from the instructor and more advanced peers. Interaction also can help develop a learning community online, promote learners' construction of knowledge in the community, and increase learners' active participation in learning.

Table 2. The Checklist for Pedagogical Usabilit

Instruction	Should be grounded in an appropriate learning theory and a valid approach
	Should have clear goals/objectives
	Should have appropriate procedures
	Should provide explicit guidance
	Should provide clear demonstration/presentation
	Should provide individualized and customized instruction
	Should be learner-centered, active learner involvement
	Should use easy and comprehensible words
	Should reduce cognitive load
	Scaffolding (learners' previous knowledge) should be available
	A variety of teaching techniques should be available
	Other learning resources/help should be available
Contents	The target area should be properly introduced
	Different language areas should be introduced in an integrated and balanced way
	Organizations of content should be clear, consistent, and coherent
	Should provide appropriate sequence of content
	Should draw the learner's attention to linguistic features (either explicit or embedded grammar instruction)
	Should provide an appropriate vocabulary level
	Should provide interesting and new information
	Should provide a variety of topics appropriate to the learner's level
	Target culture should be included (adequate cultural representation)
	A wide range of communicative functions (situations) should be available
	Delivery modes (text, image, animation, audio, etc.) should be used
	Should be authentic
	Should be relevant to the purpose and learner level
	Should be contextualized (presented in authentic contexts)
Should be applicable to other contexts or real situations	
Tasks	Should offer proper workload
	Should be suitable for the learner level
	Should be balanced in the language skills

	A variety of types of activities should be used	
	Should be purposeful	
	Should be challenging and teaching something new	
	Should be relevant to the content and reinforce the content	
	Should offer flexible opportunities for drill and practice and open-ended practice	
	Should be authentic	
	Should be easy to apply to other contexts or real situations	
Learner Variables	Should include personal information	Age, proficiency levels, topic appropriateness
		Gender
	Should consider cognitive domains	Language aptitudes
		Learning styles
		Previous knowledge level
	Should consider affective domains	Personalities
		Motivation
		Self-directed
		Self-efficacy
	Should consider metacognitive domains	Anxiety level
Different learning strategies, self-study skills		
Interactions	Learner-computers interaction (technical usability) should be available	
	Direct interaction between a learner and an instructor should be available	
	Direct interaction among learners should be available	
Evaluations	Self-evaluation should be available	
	Appropriate and timely feedback from the instructor should be available	
	Should be suitable for the learning unit (content and task)	
	Should serve diagnostic and placement functions	
	Should be reflected in the next learning unit (cyclic)	

As the last step in the learning cycle, **evaluations** should be properly provided both as diagnosis of learners and assessment of the learning progress. Evaluation needs to match the specific learning goals and objectives, be embedded and contextualized in the overall learning process, and enhance learning outcomes. In short, evaluation should contribute to the overall quality of the learning process (cyclic). Overall, assessment can be used to check that the learner has attained the goals and that the instruction, content, and tasks have met the purposes, goals, and objectives of the site. If the goals are not accomplished, then the website should be re-evaluated and possibly re-designed. It will be helpful to examine if the instructor's assessment matches the

learners' self-assessment. Not only the formal assessment, but also informal evaluation, such as feedback from both the instructor and peers, can facilitate student learning.

The following checklist (Table 2) is inclusive, since it includes all the items necessary to provide a wide range of evaluation of EFL websites. Some items in the checklist are applicable only to certain situations (e.g., if the purpose of the website is to teach only writing, then teaching all the skills in a balanced way is not applicable). A few items appear in more than one category, as they are applicable in each of them respectively. Although the checklist was developed to provide guidelines to ESL/EFL E-learning websites, this checklist can also be adapted

to designing and evaluating E-learning websites in other domains. The categories and items, except for a few items in content, are generic to any online learning website design and applicable to other subject domains.

The checklist only includes the items which actually appear on the site; hence, some items behind the scene, such as Learner Management System, a variety of data management systems, learner need analysis, and initial diagnostic and placement tests, even though these are also critical elements in an online learning system.

5. Conclusion

As theoretical efficiency does not necessarily correlate with effectiveness in learning, pedagogical usability should be taken into consideration in addition to general usability when ESL/EFL E-learning sites are designed and evaluated. Grounded in various theories, this paper argued the importance of pedagogical usability and developed schemata for its evaluation. However, the paper did not exclude the role of technical usability (general usability) in an ESL/EFL E-learning website. Pedagogical usability is often mediated by technical usability, thus, both usabilitys, are intertwined with each other and determine the effectiveness of the site and the learning outcomes, which will be useful to website developers, instructors, and individual learners.

To develop a robust pedagogical checklist, this paper borrowed a variety of theories from different areas. These theories helped the checklist be more grounded in sound pedagogy and present a more holistic, and at the same time, more detailed and specific, view of a sound EFL E-learning site. To verify the validity of each category, the researchers conducted AHP based on pairwise comparison to an expert group (10 respondents). The result shows that all the categories developed in the checklist are valid as the lowest score marked 9.2% (interactions). While the relative important may vary according to the purpose and type of each websites, this checklist can be used as a valuable information to evaluate EFL E-learning website.

Still in a rudimentary stage, further empirical data and experimental tests will be needed to validate the checklist of pedagogical usability. Particularly, it is imperative to empirically examine learners' learning outcomes after learning with the program, since they cannot be easily measured by simply examining the EFL E-learning website without empirical data collection. Although there are some limitations, this

paper provides valuable design guidelines for designing and evaluating ESL/EFL E-learning websites.

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