P-ISSN 2355-7486, E-ISSN 2621-4512

VALIDITY, PRACTICALITY AND EFFECTIVENESS OF A WEB-BASED INSTRUCTIONAL MATERIAL BASED ON LEARNING STYLES

***Hesti Wahyuni Anggraini[1], Zuraida[2], Rita Hayati[3], Dwi Maharrani[4], Nova Lingga Pitaloka[5]**
**hwanggraini@fkip.unsri.ac.id*
English Language Education, Faculty of Teacher Training and Education, Sriwijaya University, Indonesia

Received: January 11, 2025
Published: February 12, 2025

Abstract: The shifting of teaching and learning mode results in the urgency of the development of instructional materials. Ironically, the availability of web-based instructional reading material on the basis of learning style is still limited. This developmental study examined data qualitatively and quantitatively from 16 questionnaire respondents, six interviewees and two lecturers to investigate the needs of developing instructional materials, the extent to how lecturers shaped their beliefs, students' reading level, and students' learning styles. This study also aimed at finding out the validity, practicality, and the effectiveness of developed product. Three students involved in one-to-one evaluation, nine students in small group evaluation and 17 students in the field test. This research implemented a four-stage model by Akker. Formerly, the result of analysis phase represented some analysis points. Furthermore, the product was highly valid on its content, construct and technology use with average score 4.4. The average scores of practicalities were 4.1 in one-to-one evaluation and 4.2 in small group evaluation. High validity with the score 4.3 was the result of the field test. Potential effect was also high in the average score of reading test, 86.47. This study, expectedly, gives favourable impact to the teachers and students in the future.

Keywords: *developmental research, learning style, web-based instructional material*

How to Cite: Anggraini, H.W., Zuraida, Hayati, R., Maharrani, D., & Pitaloka, N.L. (2025). Validity, practicality and effectiveness of a web-based instructional material based on learning styles. *The Journal of English Literacy Education: The Teaching and Learning of English as a Foreign Language, 11*(2), 243-262. http://dx.doi.org/10.36706/jele.v11i2.51

INTRODUCTION

The scarcity of web-based reading instructional material based on either students' learning styles or students' needs has negatively contributed to the literacy skills of Indonesian students. Previous preliminary studies have proven unsatisfactory results for the writing and reading skills of Indonesian students. The limited time allocation in a reading course, low level of reading interest, the increase number of technology use and lack of access to qualified books has rapidly contributed to the low students' literacy skills. Accordingly, the use of existing instructional material is still ineffective and less interesting.

Solihin (2020) reported that, on a scale of 100, the Ministry of Education and Culture's index put access to books at only 23.1 points, while the country's reading culture received 28.5 points. Attributed to Indonesia's unique geographical conditions, it is extremely difficult to ensure equitable book distribution, leaving rural children behind. In accordance with this, a study by Ghufron and Risnawati (2014) stated that besides the presence of web-based instructional material, student is unique and each has his or her own special characters, namely learning styles. Disparities in learning styles reveal the most efficient and rapid manner for an individual to acquire knowledge from an external source. Above all, a web-based instructional material can be developed because of students' learning styles as both are linked together. Here, a web-based instructional material is defined as a type of learning material that makes use of a website or other media that can be accessed online, which means the content (material) and the delivery system (method of learning) through the use of the web. Another name for web-based instructional material was a type of learning material that makes use of multimedia and hypermedia technologies with the goal of giving students a controllable learning environment that can be tailored to their individual learning needs (Kern & Warschauer, 2000). Referring to a specific learning styles, a web-based instructional can be an alternative to support teaching and learning activities. Learning styles can be defined differently; however, learning style relates to the general manner in which he or she would like information to be delivered. O'Brien (1985) classified three learning styles, namely visual, auditory and kinesthetic learning style. Due to the rapid development of technology, many of authors put their attention to the developing instructional materials in a numerous form of products. Some studies were conducted by Elviana et al. (2020), Nafiah (2020), and Surdyanto and Kurniawan (2020). The focus of those prior studies was to design materials for EFL classes, particularly reading and pronunciation materials. The authors conducted the investigations based on the levels and interests of certain students to satisfy their needs. Those previous studies mentioned also agreed that the availability of reading resources had already fit the needs of the students, but there are few studies regarding the utilisation of students' learning styles.

Investigating the scarcity of the instructional materials based on students' learning styles, the gap is noticeable. To bridge the gap, the present study is intended to enable students with the differences by designing a web-based instructional material. Even though previous related studies had conducted the same point, Indonesia still put this as a new growing body of knowledge. The scarcity of availability of the expected instructional material, demographic and geographic characteristics of Indonesia cannot meet the bottom line of the studies beforehand.

However, there must be solutions to address these issues. The utilization of web-based instructional material can be unquestionably implemented to improve students' literacy skills. The advancement of technology is rapidly changing, so it allows English language teachers or lecturers to create more engaging learning materials. Not all learners have equal access to technology or learn in the same way. This study focuses on developing materials that are accessible to diverse learners. Then, here, a valid, effective and practical instructional material is really needed as it provides comfort to the students, ease to understand the material and its flexibility to get. Using this instructional material, it is hoped that students' reading skills would become more dynamic and independent. Ease of learning and availability to learning

resources that correspond with students' learning styles will undoubtedly have a favourable effect on the knowledge development of students. The objectives of this study were to develop a web-based instructional material in a reading course on the basis of students' learning styles as a product and to investigate the shortcoming and dominance of the developed product. In line with the objectives, the problems of study were formulated whether or not the developed instructional material was valid, practical and effective. Also, it asked for suggestions and insights toward the developed product.

METHODOLOGY

Subjects

This developmental study was carried out in English Education Study Program, Faculty of Teacher Training and Education, Palembang, Indonesia. The subjects were the first semester students taking Literal Reading course in academic year 2022/2023 and two lecturers who taught Literal Reading course.

Table 1. Subjects of the study

Formative evaluation stage	Number of students	Description of students
One-to-one evaluation	3	One student who represents three types of learning styles
Small group evaluation	9	Three students who represent three types of learning styles
Field test evaluation	17	Students who belong to Palembang class in Literal Reading course
Total	29	

The subjects were chosen purposively on the basis of their reading level and learning style. The students participated in each stage of the evaluation were then selected from each group depending on the required number of participants. Students in each reading level category were selected based on a number of criteria, for instance, students should be confident, outgoing, and cooperative when sharing their ideas and comments during the evaluation, particularly in one-to-one and small group settings. Also, the subjects of the study were chosen in order to represent the three types of learning styles.

Design and Procedures

Design

The method employed in this developmental research was suggested by Akker (1999). This study focused specifically on creating instructional reading materials by modifying existing resources to create the final product. Three primary factors—validity (content, language, and instructional design), practicality, and the potential impact of the reading materials—were used to assess the developed product's quality. In the step of evaluation and revision, those criteria were assessed. Tessmer (1993) mentioned that formative assessment technique was applied in this study's evaluation phase to enhance the effectiveness of the intervention.

Procedures

This developmental study employed three phases proposed by Akker (1999), namely analysis, design, evaluation, and revision phase. In the first phase, the writer conducted instructional analysis, environmental analysis, student's need analysis, and student's reading level. To continue, design phase focused on creating prototype paper-based and computer-based design. Paper-based design refers to the writing of competences, reading passages, pre-test, and the writing of storyboard while internet-based design started to create html programming. Below are the stages of developing the instructional material.

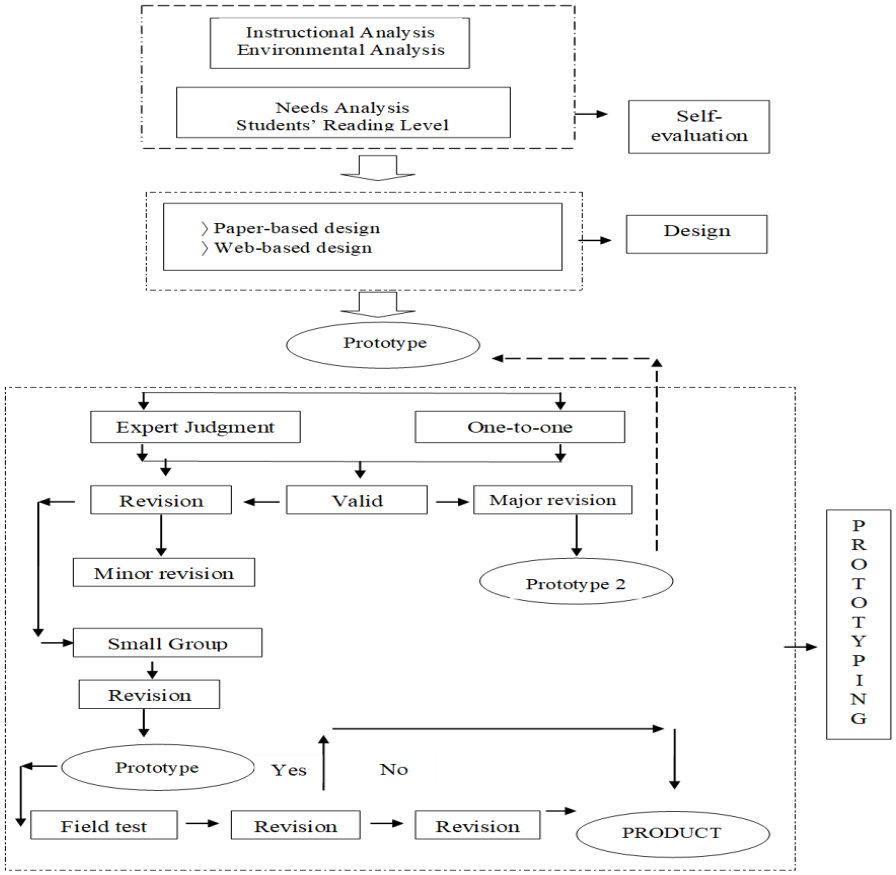

Figure 1. Developmental design by Akker (1999)

Data Collection and Data Analysis

Data Collection

To collect the data, questionnaires, semi-structured interviews, observation, and reading test were administered. At first, the intent of the questionnaire to the students and teacher was to collect data on their attitudes, expectations, and difficulties in teaching and learning English. In addition, the questionnaire was designed to collect information regarding the shortcomings and merits of regularly used instructional materials, as well as the challenges encountered. In addition, a different questionnaire was issued to determine the learning styles of the students. In the first stage of developmental research, i.e., need analysis, a thirty-item questionnaire was administered to the students to know their learning styles. The second questionnaire was distributed in the one-to-one stage to the representative of students with the three learning styles with one student of each. Students who

participated in the one-to-one and small group evaluation needed to fill in a 33-questionnaire item. The last questionnaire was given to the students in the filed test stage to know the effectiveness of the developed materials.

Next, observation was carried out to obtain data on students' activities utilizing web-based instructional materials regarding their learning styles. Interviews were aimed to bolster the gained data from questionnaires and observation. The interview offered recommendations, remarks, and constructive criticism from students and lecturer as well. The interview to the two lecturers was administered with seven questions and interview with the three representative students with three questions. At last, reading comprehension test was administrated to know the potential effect of the developed product.

Data Analysis

The gained data were quantitatively and qualitatively examined. The authors evaluated the data from the questionnaire and reading comprehension test using the quantitative method. The qualitative method was utilised to analyse and describe the interview and field observations. Several questionnaires were employed to gather data from the evaluations of experts and the replies of students in one-on-one and small-group evaluations. The results were then calculated and categorised based on specific criteria to determine the product's validity and usability. The learning style questionnaire was also statistically calculated. Then, the data from the English teachers and students' comments and ideas through interviews in one-to-one and small group evaluations were interpreted as additional product usability information. During field testing, the potential impact was estimated on the basis of the results of a reading comprehension test. If 70% of the students got the required grade, the product may have a potential effect (Universitas Sriwijaya, 2021).

FINDINGS AND DISCUSSION

Findings

a. Analysis Phase

Instructional analysis. Referring back to the first stage of developing instructional material, instructional analysis was specifically conducted in the focus of curriculum applied in relation to the English and the content subject of English Education Study Program in Literal Reading course. Based on the curriculum used, one of specific skills (SS3) and other supporting skills mastered by the students was the ability to use relevant and up-to-date information and communication technology in English language learning and research, namely the ability to operate computers, laptop, and mobile phone along with mastering the use of devices effectively (Rusman, 2009, p. 263). Learning materials were developed in accordance with the advancement of technology and science during teaching and learning process. To note, Literal Reading course requires the students to be computer literate as a form of their personal competence.

Analysis of textbook used in teaching and learning process continued this phase subsequently. The readability level of the passages in the textbook was appropriate for the university students. The content of the passages led the students to their knowledge enrichment. In contrast, the display of passages did not meet the students' profile. For illustration, no images were found and all was written monotonously. Fotos and Nassaji (2008) offered numerous principles of language

learning that should be considered when designing language teaching materials, including: (1) making actual (real) communication the centre of language learning, (2) offering opportunity for students to try out what they know, (3) tolerance for mistakes made, which is an indicator that students are advancing towards their communicative competence, (4) providing possibilities for language learners to build honesty and fluency, (5) integrating language skills in various ways, including speaking, reading, listening, and writing, and (6) providing opportunities for language learners to draw their own conclusions or discover grammatical rules.

In relation to the reading texts in the textbook used, the texts were suitable and suited with the lesson learned even though they were tediously presented. It could be suggested that the developing of instructional reading material was necessarily suggested.

Environmental analysis. In this investigation, the authors observed learning environment in research settings. This observation revealed a number of conditions at this university. Students frequently brought and used laptops during the teaching and learning process; internet connection supported the activity; electricity was good, language laboratory was available with a number of seats along with its provided learning tools, and the university has introduced the students to the learning management system. Given these criteria, it can be determined that web-based instructional reading material suggests on the reading level of students might be incorporated into the teaching and learning process.

Students' needs analysis. In order to conduct needs analysis, data were obtained from first-semester students, Literal Reading course lecturers, and the study program coordinator. This study utilized situation analysis, deficiency analysis, present situation analysis, and strategy analysis as parts of needs analysis. Based on the results of needs analysis, some highlights were drawn. Firstly, reading was viewed as a crucial subject for developing the field, content subjects, and interest of students. Even though the student's English ability was adequate, they acknowledged that they continued to struggle with English reading and that their enthusiasm in reading was poor. Due to the lack of instructional resources utilized by lecturers, it had not been possible to accommodate the varied learning styles of students. In addition, students were not permitted to learn according to their individual needs. The information was provided monotonously. In addition, lecturers and institutions were limited in their ability to provide students with learning resources, resulting in students' continued difficulty in locating pertinent instructional materials. The final reason for facilitating students' learning styles was that each student had their own unique attributes, to help students increase their reading interest and preference, to increase students' knowledge, and to introduce them to a variety of reading material and evaluation methods.

Table 2. The coding categories from the interview with the teachers

Themes	Sub-themes	Codes
Reading problems	Linguistic features	Lack of vocabulary
Teaching activities	Reading skills	Lack of grammar mastery No experience in fast reading

	Frequency of teaching methods	Maximize lecture strategy
Students' differences	Learning styles	Balance individual work and online learning resources Maximize visual and auditory teaching media
Teaching media	Forms	No kinaesthetic teaching media Maximize sound and moving images Balance use of online learning platforms
Developing reading material	Requirements of reading materials	Suitable readability level Fit with students' learning styles Various text genres Interesting activities

Problems in reading. The first research question aimed to investigate the English language needs of developing instructional materials, the extent to which teachers and students shaped their beliefs. Based on teachers' responses in the semi-structured interview, it showed that they had the same main points which can be described in one theme, namely students' problems in reading comprehension. These problems were divided into sub-themes namely linguistic features, such as lack of vocabulary lack of grammar mastery, and reading skills, like no experiences in fast reading. Teachers' statements were as follows:

"Their reading speed still needs to be improved as well as their vocabulary mastery." (Teacher 1)

"Students' problems in reading were that they were lack of vocabulary and grammar mastery. They are also not accustomed to fast reading of English texts." (Teacher 2)

Teaching activities. This part focused on the frequency of teaching modes as the main core of the teaching activities and whether individual work, group work and online learning resource can be balance.

"Most of the time I applied lecture method, used simple media and multimedia to support teaching activities." (T1)

"In each meeting, I usually gave lecture and used additional materials from Google and YouTube. They listened to my explanation during my lecture, read the attached materials and watched YouTube videos that I had already prepared for them on e-learning." (T2)

Students' differences. In addition to the variety of teaching modes, students were also various. Students' learning styles were different from individual. It was stated that it was necessary to maximize visual and auditory learners. However, no kinesthetic students were found as the recent condition forced to conduct online learning.

"….. by providing various learning resources and activities." (T1)

"I only make variations in terms of class activities and reading materials. My lecture and additional teaching videos are probably matched with visual and auditory learners. Since it was online class, learning activities for kinaesthetic learners are not fully facilitated." (T2)

Teaching media. Both teachers agreed that teaching media should meet the students' needs and be designed on the basis of students' condition. Teachers usually used sounds and moving images in order that students were enthusiastically participated during the teaching time. Then, another teacher mentioned the balance use of all provided online learning platforms.

"…. padlet, VoA news, kahoot, jamboard." (T1)

"It was only in the form of video which has sound and moving images." (T2)

Developing instructional materials. This section was concerned with the requirements of materials. Some rules to fulfil were a suitable readability level, students' learning styles, the availability of various text genres, and the development of interesting activities.

"We should concern with what students' need, provide wide range of text genre, facilitate the students with interesting activities to help them comprehend the reading." (T1)

"The reading material should cover students' needs such as the suitable readability of the used passages. Besides, the learning activities of reading class must facilitate students' learning styles." (T2)

To get in depth discussion from the students' responses, the transcript was broken down into parts.

Table 3. The coding categories from the interview with the students

Themes	Sub-themes	Codes
Printed textbook	Characteristics	Systematic
		Imaginative
		Writing techniques
		Simplicity
Reading problems	Linguistic features	Lack of vocabulary
		Lack of grammar mastery
	Reading skills	No experience in fast reading
Learning activities	Timing	Extend the credit hours
	Kinds of task	Balance individual and group work
	Presence	No teachers
Developing reading material	Requirements of reading materials	Include course objectives
		Suitable readability level
		Fit with students' learning styles
		Various text genres
		Interesting activities
		Include summary

Various types of questions

Printed and digital reading textbook preference. Students' viewpoints focused on the characteristics of the books. One of them is the systematic arrangements of the book content, for instance, the availability of effective explanation, the samples, and the portion of exercises. Imaginative pictures, images, or display of graphs, charts or pies are other characteristics of interesting printed textbooks. Simplicity, in this case, refers to the ways how to describe a certain discussion effectively by using the effective word choice, the absence of confusing word meaning, suitable font choice, the use of proper figures, etc.

"I like the book we were using as it contains pictures. I preferred the colourful books. The book also has to contain imaginative for visual students. The simplicity of the book let me know the content more easily." (S1)

"In my own opinion, the book must be systematic, like, there is title, explanation, and exercises. The pictures are OK, but it must be visible and not too small font. It is more on the technical writings." (S2)

"I like the simple book. It provides the discussion from the easiest one to the most difficult ones. It has proper pictures. The use of visible fonts and word choice should be paid attention, too." (S3)

Then, talking about the digital reading textbook, some ideas come up as follows.

"It contains colourful pictures, short passages. It should provide summary only." (S1)

" Digital reading textbook must have no longer paragraphs in one page. It should contain audio only." (S2)

"It contains video, the margins should be well-spaced. It must be simply and easy to understand and interesting so that the students are motivated to read." (S3)

Problems in reading. The students' problems in reading were divided into linguistic features, such as lack of vocabulary and lack of grammar mastery, and reading skills, such as no personal experiences in fast reading.

"I am concerned with my vocabularies and fast reading." (S1)

"I had problems with my reading speed as I had no experiences on it." (S2)

"My problems are lack of vocabulary and grammar mastery. I also had problems with fast reading. I need much time to finish my reading task." (S3)

"I didn't find any difficulties. My laziness were my reading barriers. (S4)

Learning activities. In a good textbook, both printed and online version, learning activities may be one of the requirements to complete. A variety of learning activities allow the students to experience distinctive learning activities. Monotonous activities caused boredom to the students. Time constraints should be set proportionally considering the course objectives, material discussion in depth, learning activities, and evaluation. Here, one of the participants suggested to adding the allotted time. Then, kinds of task should be balanced numbers so that no boredom was experienced. Above all, the absence of teacher presence happened during online learning. Here, it is suggested that learning experience should include teacher-student and student-student interaction.

"Literal reading class is enjoyable and the activities should be designed with more interaction in the classroom." (S1)

"In literal reading class, the activities can be applicable, interesting, well-structured. The activities should be fit with the learning objectives. Both printed and digital reading textbook should be properly designed." (S2)

"Reading class is a bit interesting as I am not keen on reading. Then, uninteresting activities are not big deal unless the teacher gives enough explanation of a certain material. The explanation itself should be simply. Time constraints can be extended to be four credit hours. Next, types of classroom activities are suggested to be reduced and need more interaction." (S3)

"The classroom activities were enjoyable by using proper media. The interaction with other students had enough, like in discussion. Allotted time is enough in three credit hours. The books are suggested to have balance number of activities, both in individual and group work. I personally prefer individual work in because I found no problems in it." (S4)

Developing instructional materials. The requirements of reading materials should include course objectives, suitable readability level, in accordance with the students' learning styles, the availability of various text genres, the development of interesting activities in reading, summary and cover various types of questions for the evaluation, for instance, multiple-choice questions, essay questions, and some other types of questions from low level of thinking skill (LOTS) to high order thinking skill (HOTS) questions.

"I choose multiple choice since they are easy to answer. The questions should also be designed from the easiest to the most difficult questions. I prefer scientific references, such as, recent technology advancement. The reading passages also fit with students' reading level." (S1)

"I prefer multiple choice and short answer as multiple choice has an exact answer. Then, genres are about global information in order that those can be reference and broaden our knowledge about recent updates." (S2)

"I suggest to create more multiple-choice questions. I like legend textbook because it recalls about our historical news and can be such entertaining references." (S3)

"The developed reading materials need more pictures since the books cover more as I belong to visual learner. Activities are enough. The explanation is well-structured. I also suggest to provide audio and videos to ease the students learn. The topic of passages is more on recent news updates. Types of questions prefer short answers." (S4)

From the questionnaire developed by O'Brien (1985), most of students belonged to visual learners. Visual learners prefer seeing any kinds of demonstration that helps them understand a certain material. In addition, auditory learners listen to what others are explaining and kinaesthetic learners are eager to directly engage in an activity.

Table 4. Students' learning styles

Type of learning styles	Number of students
Visual	11
Auditory	2
Kinaesthetic	3
Total	16

P-ISSN 2355-7486, E-ISSN 2621-4512

Students' reading level analysis. Students' reading levels ranged from very good (one student), good (eight students), fair (six students), and poor (one student). It could be inferred that the majority of students were able to comprehend English reading passages, despite encountering difficulties such as a lack of vocabulary knowledge. While students rarely engaged in English reading materials, their exposure to English reading passages contributed to their reading proficiency. In addition, students reported that reading class activities were unenjoyable because they viewed reading class as a requirement rather than an engaging pastime. The length of time required to operate a computer could be an influence in a student's reading level.

b. Design Phase

This developmental study employed a design by Akker (1999). Design phase aimed at developing the prototype of the product presented in the printed one. In this phase, some stages were formulated, namely developing assessment instruments, developing learning strategies, and lastly, developing and selecting learning/instructional materials. The instructional materials had already met the students' needs and followed the curriculum used in the study program. The use of the advancement of technology had stated in the learning outcome of the Literal Reading course. As mentioned previously, one of specific skills (SS3) and other supporting skills were the ability to use relevant and up-to-date information and communication technology in English language learning and research. In this study, the technology refers specifically to the use of web-based instructional materials. Furthermore, the findings of needs analysis reported that students applied visual, audio and kinaesthetic student's learning style. To accommodate the students' needs, the instructional materials were designed by using interactive multimedia. Hence, both printed and web-based instructional materials were provided in accordance with the development of science and technology use and students' learning styles during teaching and learning process.

The developed instructional materials in Literal Reading course covered all course materials, for instance, reading skills and thinking skills. Reading skills included skimming and scanning strategy, previewing and predicting strategy, vocabulary building strategy, finding topic and patterns of organization of paragraph strategy and making inference strategy. Thinking skills encompassed critical thinking and timed-reading activity. This product was also equipped with the core and basic competencies of English and content subjects that could be integrated, such as program learning outcomes, course learning objectives, an explanation of course materials, aspects of reading comprehension, references, videos, images, and exercises.

To complete the reading materials, the researchers also designed some introductory tasks as warm-ups before to the actual reading materials. Nevertheless, no specific vocabulary knowledge was supplied. Videos and audio were embedded via a web search and the YouTube website. In order to finish the instructional materials, a test of reading comprehension was included. All of the items were created based on the indicators or learning outcomes specified.

After completing the reading materials and their review, the materials were converted into a web-based format. Hence, a storyboard was created. The storyboard had the following elements: (1) home page; (2) log-in page; (3) course front page; (4)

learning objectives; (5) content explanation; (6) exercises; (7) additional learning activities (homework); (8) feedback and scoring; and (8) references. The developed product can be accessed through PC, mobile phone or laptop at anywhere and anytime. See appendix to see the sample of developed product.

c. Evaluation and Revision Phase

Here, formative evaluation was administered and revision was conducted as suggested. Formative evaluation includes five stages.

Self-evaluation. The researchers found some errors in the developed instructional materials. The errors were connected to grammar, misspellings, capitalization, punctuation, the content of the developed products, exercises, and additional tasks. Also, the evaluation focused on the arrangement of images (such as size, colour, brightness and so on) and text (such as fonts, size, clarity, and so on), the cover, and the presentation of the material.

Table 5. The expert's comments on content aspect

Expert's comment	Response
Even though the content material was suitable for the students' age, it was so easy for college student	The material was developed from low level of difficulty to high level of difficulty, for example, the revision of word choice, reading text and sample of exercises
No materials were for kinaesthetic learners.	Revision was done for kinaesthetic learners, especially in additional tasks.
Many multiple-choice questions were found.	Revise the question types by varying into any other appropriate questions.

After revision, the developed product was provided to experts for evaluation and validation.

Expert review. In this evaluation phase, three experts evaluated the developed product in terms of the content (English), instructional design (construct), and media (technology-web) to know developed product was valid or not. Evaluation, comments, suggestions or opinions was needed based on the scoring evaluation. Below is the display of the result of validation of the three experts.

Table 6. The result of developed product validity

Aspects	Average Score	Category
Content (English)	4.4	Very High validity
Instructional design (construct)	4.4	Very High validity
Media (technology, namely web)	4.4	Very High validity

In terms of the content validity (i.e., English), specifically, a lecturer of English was asked to evaluate the developed product. The result of the evaluation showed that the content of product was very high validity, meaning that the students could use the developed instructional material to support their English reading. Neither

revision nor comment was found. In addition, instructional design validity (i.e., construct evaluation) validated by the expert, whose expertise in instructional design or curriculum, also showed that the product had very high validity. It could be implied that the product was in line with the curriculum used in that study program, the sequence of material presentation was good, the product met the learning objectives, the developed instructional material met the students' characteristics, a web-based instructional material was user friendly and the evaluation in the product was sufficient. Also, revision was not needed in this term. Lastly, regarding the media validity, a lecturer of computer science whose expertise in web development mentioned that the developed product was valid with revision. The following excerpts explained the expert's comment.

> E3 "About page must be filled with relatable information."
> E3 "Course image thumbnail must be in clear, high resolution and describe the course title."

Regarding the expert's comment, to produce a sufficient web-based instructional material, web development should utilize black box. In addition, the course thumbnail image must be clear and of good resolution, and it must convey the course's title. Here, specific application could be operated.

One-to-one evaluation. To gather the data of practicality of the developed instructional material, a questionnaire was administered to the three chosen students, representing one visual learner, one audio learner, and one kinaesthetic learner. One-to-one evaluation aimed at knowing the students' comments toward the product in response to the students' needs, material presentation, effectiveness and efficiency of the product, evaluation, attractiveness of web-based material, and media quality. The gained data from the three students were then calculated to determine the degree of practicality of the product. The result of questionnaire of the developed instructional material reached 4.1 average score, meaning that the developed product had high practicality. In detail, material presentation and attractiveness of web-based material still need improvements as the average scores are 3.8 and 3.7 of each.

Table 7. The result of questionnaire in one-to-one evaluation

Aspects	Average Score	Category
The match between materials and students' characteristics	4.2	Very High Practicality
Material presentation	3.8	High Practicality
Effectiveness and efficiency of the product	5	Very High Practicality
Evaluation	4	High Practicality
Attractiveness of web-based material	3.7	High Practicality
Media quality	4.1	High Practicality
Total Average Score	4.1	High Practicality

To support the obtained data from the questionnaire, an interview was done. The purposes of the interview were to explore students' opinions, comments, and suggestions toward the product and to investigate the strengths and weaknesses of the product. To shorten, their responses were presented below.

Table 8. The result of interview in one-to-one evaluation

Comments	Suggestion(s)
Strengths	Provide feedback, explanation or discussion in each question item, beside the score
Concise material presentation	Use high image resolution
Ease to comprehend the material	
The visibility of students' scores	
A well-structured material presentation	
Simple design	
Weaknesses	
The low image resolution	
No feedback in the evaluation	

The result of the interview above suggested that the developed instructional material could help the students to meet their needs. A web-based material could obviously facilitate the students with their own unique characteristics which means that while some students belonged to audio learners, others were either visual or kinaesthetic learner. Regarding the comments, some revisions were done, for example, the improvement of image quality and the feedback were not revised yet.

Small group evaluation. Small group evaluation involved nine students of English Language Education Study Program taking Literal Reading course. The chosen students in this phase were different from that of one-to-one evaluation. Three students represented each type of language learner meaning that three visual learners, three audio learners and three kinaesthetic learners. The language instruction in this phase was implemented twice before the authors delivered a questionnaire. The display of the result shows that all aspects on the developed instructional material are practical as shown in the average score 4.2. In addition, the practicality of the developed product can be deduced from the interview debriefing results with the students. Using the developed product in the learning process and the students' viewpoints of its value were the key subjects of the interviews. About the application of the product, the majority of students claimed that it could be utilized everywhere and at any time.

Table 9. The result of questionnaire in small group evaluation

Aspects	Average Score	Category
The match between materials and students' characteristics	4.4	Very High Practicality
Material presentation	4.1	High Practicality
Effectiveness and efficiency of the product	4.5	Very High Practicality
Evaluation	4.2	Very High Practicality
Attractiveness of web-based material	3.8	High Practicality
Media quality	4.3	Very High Practicality
Total Average Score	4.2	Very High Practicality

The result of the interview with the students was in line with the gained data from the questionnaire. An excerpt of the student was shown below.

S1 "It is interesting since it has audio and video. It has already met my need."
S2 "The display is okay, but better to fit with the page width."
S3 "It should provide translation of the words so I don't open my dictionary."
S4 "It is user friendly and flexible to use ……"

From the excerpts, the students admitted that the developed instructional material was applicable, useful and relevant with their needs and learning outcome.

Field test. The field test was conducted in a real class of Literal Reading course of students of English Language Education Study Program from Palembang class. Those who have participated either in one-to-one and small group evaluation were not engaged anymore in the field test.

Table 10. The result of reading comprehension test

Score Interval	Number of Students	Category
86-10	17	Very high
71-85	22	High
56-70	1	Medium
41-55	0	Low
0-40	0	Very low

The potential effect of the product was also high as shown in the average score of the reading comprehension test 81.9. From the test, 42.6% student got very high score and 55% students got high score. It can be implied that a web-based instructional material had potential effect on student's reading comprehension.

Discussions

Analysis phase had found some obtained data, namely the result of instructional analysis, environmental analysis, needs analysis, students' reading level and students' learning styles. Here, some points needed to be discussed. Firstly, the

developed instructional media has represented one of specific skills mastered by students. The ability of using relevant and recent update information and communication technology in English language learning, for instance, the ability to operate computer, laptops, and mobile phone, was one of the aspects relating to the developed product. This first phase showed that the developing instructional reading material was necessarily viewed in terms of the effectiveness, efficiency, and flexibility. Furthermore, the integration of web contributed positively to the success of language teaching and learning process. A study by Warni et al. (2018) mentioned that the use of technology resulted on the enjoyment and motivation in learning English reading. Hayati et al. (2021) also revealed that ICT gave positive contributions to students' learning attitude in writing skills. The use of technology to learn English outside of the classroom has facilitated the growth of student engagement, which includes learning motivation, metacognitive awareness, self-confidence, and social skills. Using a variety of information and communication technologies, it is projected to assist English teachers in enhancing their students' English proficiency with a focus on learner autonomy. Even though some drawbacks, challenges and problems still existed in web-based instructional material. Anggeraini (2020) and Salam (2017) mentioned that the need of writing a reading material refers to the three aspects, namely necessity, deficiency and need. When it comes to the necessity, the obligation to write or develop instructional material is that students have a reference to master, for example, reading strategies. It can be suggested that the developed reading had to arrange all reading strategies stated in the syllabus. Regarding the description the need aspect above, the lack of images, the unclear images provided and the availability of instructional materials on the basis of students' need were still minimal. Therefore, the writing of developing the instructional material is valuable in order that students' need can be complete. The last one, as the need of development of instructional materials cannot be separated from the two other aspects mentioned previously, the attention to the seven aspects of writing or developing instructional materials is substantial. Among the seven aspects, type of information, learning activities and learning evaluation are the three main aspects developed in this study.

It is obvious that the existing instructional material used during language teaching and learning process did not put any attention to the students' profiles and no modification was significantly found. Instructional materials were monotonous by neglecting what learning styles experienced by the students. El-Sabagh (2021) in his study stated that adaptive learning environment was considered as a stimulus to encourage learning and enhance student engagement; hence, building suitable adaptive learning environment settings added to individualising education in order to reinforce learning outcomes. Skills, participation/interaction, performance, and emotions are factors connected to student involvement in web-based learning. The significance of engagement characteristics was due to their influence on learning outcomes (Nkomo et al., 2021). In addition, some other relevant studies were described. Adaptive web-based learning based on learning styles placed significant value on behavioural engagement, in which students actively participated in online classrooms while managing their own learning to adjust instruction to each learning style. Thus, learning outcomes were enhanced (Hussein & Al-Chalabi, 2020)

To conduct design phase, some steps were followed, namely deciding the appropriate learning objectives, grouping students' learning styles, checking

students' reading level, drafting the explanation of the materials, and constructing reading test. Moreover, the researchers designed material's presentation followed by the cover design. Videos and images were also included in the developed instructional materials.

The specific characteristics of the product were firstly the attractiveness of the material presentation. The use of a web-based instructional has provided the students with the ease, flexibility and effectiveness. Some studies have demonstrated that exposing students to new words and expressions through the use of authentic materials has a significant impact on the development of their reading comprehension (Akbari & Razavi, 2016). Harmer (1991) noted that only authentic material can enhance students' listening and reading skills effectively. Then, students experienced affective factors after implementing one type of authentic material, namely Android-based learning material (Anggraini, Novianti and Bardadi: 2018)

Then, evaluation phase mainly focused on self-evaluation, expert review, one-to-one evaluation, small group evaluation and field test. Self-evaluation was another type of formative evaluation that assessed grammatical use, sentence structure, the content and material presentation. Some errors were found in the developed instructional material that urged to the revision stage.

Experts were then obliged to evaluate the content, instructional design and media application in the developed material. Point highlighted in the review phase was that even though the developed product were ready to use, the utilization of black box to produce a sufficient web-based instructional material was crucial. In addition, the course thumbnail image must be clear and of good resolution, and it must convey the course's title. After the review phase, revision was conducted until it was finally effective to use.

In the next two steps, one-to-one and small group evaluations were in the purpose of knowing the practicality of the product. The result showed that the product can be implemented and be practical. Fatmianeri, Hidayanto, and Susanto (2021) found that the developed instructional material was practical, even though it was still found that some revisions needed in terms of the use of images in the web-based material. It was also essential to conduct some discussions with the English lecturers in order to obtain additional information about the product created. Tessmer (1993) explained that the designer can also evaluate the implementation and appeal of the instruction to lecturers to determine if the instruction can be utilized successfully in the real class or not.

Lastly, the findings of field test showed that there was potential effect of using the web-based reading instructional material. Also, Fatmianeri, Hidayanto, and Susanto (2021) found that the developed instructional material could be used and could contribute to the students' reading skills. Puspitasari, Surjono & Minghat (2018) mentioned that utilizing web-based instructional reading materials increased student's achievement of learning outcomes.

CONCLUSION AND SUGGESTION

Students are diverse. They have their own learning styles, some are auditory, some others are visual and kinaesthetic. Regarding these differences, one way to accommodate this condition is to provide instructional material that meets students' needs and suits with their learning styles. Moreover, the current situation during the

pandemic situation urged the educational institutions to consider the use of technology to support teaching and learning activities.

The developed product was considered valid, practical and effective. In addition, this product matched students' learning styles and facilitated the needs of the students. To shorten, it can be suggested that the developed product can be implemented in a reading course.

Obviously, there are some limitations to this research. The participants in this study were all undergraduates from a single institution, so its results cannot be generalized to other learning contexts. Next, data gathered depended on the subjective perceptions of the students. It is probable that their actual learning outcomes differ from their perceptions. Future research is anticipated to entail a greater diversity of students and institutions.

ACKNOWLEDGEMENTS

Authors thank to Sriwijaya University and all participants of this study. The research was funded by DIPA of the Public Service Agency of Universitas Sriwijaya 2022. SP DIPA-023.17.2.677515/2022, On December 13,2021. In accordance with the Rector's Decree Number: 0110/UN9.3.1/SK/2022, On April 28, 2022.

REFERENCES

Akbari, O., & Razavi, A. (2016). Using authentic materials in the foreign language classrooms: Teachers' perspectives in EFL classes. *International Journal of Research Studies in Education, 5*(2), 105-116.

Akker, J. (1999). Principle and methods of development research. In J. Akker, R. Branch, K. Gustalfon, T. Nieveen N, &Plomp (Eds.), Design methodology and development research (pp. 1-14). London: Kluwer.

Anggeraini, Y. (2020). Language teaching in the digital age: Teachers' views and its challenges. *Research and Innovation in Language Learning*, *3*(3), 163-172.

Anggraini, H. W., Novianti, H., & Bardadi, A. (2018). Pengembangan bahan ajar berbasis android untuk meningkatkan kemampuan pengucapan pada mahasiswa. CESS (Journal of Computer Engineering System and Science), 3(1), 83-86.

El-Sabagh, H. A. (2021). Adaptive e-learning environment based on learning styles and its impact on development students' engagement. *International Journal of Educational Technology in Higher Education*, *18*(1), 1-24.

Elviana, R., Inderawati, R., & Mirizon, S. (2020). Developing interactive multimedia for teaching descriptive texts based on Palembang local culture. *Indonesian EFL Journal, 6 (1), 19-26.*

Fatmianeri, Y., Hidayanto, E., & Susanto, H. (2021). Pengembangan Modul Elektronik Berbasis Differentiated Instruction untuk Pembelajaran Blended Learning. *JIPM (Jurnal Ilmiah Pendidikan Matematika), 10*(1), 50-62.

Fotos, S., & Nassaji, H. (2007). Form-focused instruction and teacher education: Studies in honour of Rod Ellis. *(No Title).*

Ghufron, M. N. & Risnawita, R. (2014). Gaya belajar. Yogyakarta: Ar-ruz Media.

Harmer, J. (1991). The Practice of English Language Teaching. London: Longman.

Hayati Hussein, A. A., & Al-Chalabi, H. K. M. (2020). Pedagogical agents in an adaptive E-learning system. *SAR J. Sci. Res*, *3*, 24-30. *Journal*, *6*(1), 19-26. https://doi.org/10.25134/ieflj.v6i1.2634

Kern, R., & Warschauer, M. (2000). Theory and practice of network-based language teaching. In M. Warschauer, & R. Kern, Network-based language teaching: Concepts and practice (pp. 1-19). New York: Cambridge University Press. Retrieved on May 2015.

Nafiah, U. (2020). Developing English modules with integrated Islamic values and Jambi local wisdom. *Studies in English Language and Education, 7*(1), 96-112.https://doi.org/10.24815/siele.v7i1.15138

Nkomo, L. M., Daniel, B. K., & Butson, R. J. (2021). Synthesis of student engagement with digital technologies: a systematic review of the literature. *International Journal of Educational Technology in Higher Education*, *18*, 1-26.

O' Brien, L. (1985). Learning Channel Preference, Rockville, MD: Specific Diagnostics, Inc.

Puspitasari, E. D. T., Surjono, H. D., & Minghat, A. D. (2018). Utilizing web based learning as 21st century learning media for vocational education. *International Journal of Engineering & Technology*, *7*(4.33), 157-160.

Rusman, R. (2009). Layanan pembelajaran berbasis e-learning. *Majalah Ilmiah Pembelajaran*, *2*(6), 144.

Salam, S. (2017). Developing needs analysis based-reading comprehension learning materials: A study on the Indonesian language study program students. *Advances in Language and Literary Studies*, *8*(4), 105-113.

Solihin, A. (2020). Pembelajaran Online denganAplikasi Zoom Meeting di Kelas 5 SDN 1 Selaawi di Masa Pandemi Covid-19. *Gunahumas (Jurnal Kehumasan), 3*(2), 17-24

Surdyanto, A., & Kurniawan, W. (2020). Developing critical reading module using integrated learning content and language approach. *Studies in English Languageand Education*, *7*(1), 154-169. https://doi.org/10.24815/siele.v7i1.15098

Tessmer, M. (1993). Planning and conducting formative evaluation. Philadehelphia, PA: Kogan Page.

Universitas Sriwijaya. (2021). *Buku pedoman Universitas Sriwijaya 2021/2022*. Inderalaya: Universitas Sriwijaya.

Warni, S., Aziz, T. A., & Febriawan, D. (2018). The use of technology in English as a foreign language learning outside the classroom: An insight into learner autonomy. *LLT Journal: A Journal on Language and Language Teaching*, *21*(2), 148-156.

About the Authors:

Hesti Wahyuni Anggraini received the master's degree in education. Her research interests are educational psychology, ELT and EFL. She is also interested in material development.

Zuraida is a senior lecturer of English of English Education Study Program at Sriwijaya University, Indonesia. She is interested in ELT studies.

Rita Hayati is a senior lecturer, Department of Language Education and Arts, Faculty of Teacher Training and Education, Sriwijaya University. Her interest is in English Language Teaching, especially in English skills.

Dwi Maharrani is a lecturer of English of English Education Study Program at Sriwijaya University, Indonesia. She took her bachelor's and master's degree at Sriwijaya University in the same major. Her interests are about English Education, School Management and Leadership, Digital Literacy and Entrepreneurships.

Nova Lingga Pitaloka is an Assistant Professor of English of English Education Study Program at Sriwijaya University, Indonesia. She focuses the most on teaching English skills. For her research, she is interested in teaching and learning English skills and the use of technology for teaching and learning English.

APPENDICES