

DEVELOPING WEB-BASED ONLINE TEST SYSTEM TO BOOST IELTS ACADEMIC READING SCORE

Hesti Rokhaniyah

International Relations Department, University of Darussalam Gontor
Email: hesti.r@unida.gontor.ac.id

Oddy Virgantara Putra

Informatics Engineering, University of Darussalam Gontor
Email: oddy@unida.gontor.ac.id

APA Citation: Rokhaniyah, H. & Putra, O. V. (2021). Developing web-based online test system to boost IELTS academic reading score. *English Review: Journal of English Education*, 9(2), pp. 9-18.
<https://doi.org/10.25134/erjee.v9i2.4348>

Received: 19-02-2021

Accepted: 18-04-2021

Published: 15-06-2021

Abstract: Web technology provides rich resources for both educators and learners in English teaching and learning process. In this context, the study aims at developing web-based online test for IELTS academic reading test on the users need for learners and educator of Universitas Darussalam Gontor. Addressing the issue of online test developing, this study utilized Alessi and Trollip instructional system design model. The formative evaluation and the increase in the average score at the pre-test and post-test of the learning motivation included alpha testing validated by two material and media experts and beta testing on learners' attitude toward the online test, while summative evaluation covered learning outcomes. Upon analysis, the finding demonstrated that: (1) the resulting website: <https://gets.unida.gontor.ac.id/pertanyaan/quiz> was able to provide online evaluation for assessing reading performance among learners; (2) the increase in the average score on the pre-test and post-test of the learning outcomes of all learners was 0.43 (moderate category) and learner motivation scale was 0.38 (Medium-g courses). Hence, web-based online test could optimize learners' excitement to assess their IELTS proficiency.

Keywords: *web-based online test; IELTS; academic reading*

INTRODUCTION

The International English Language Testing System (IELTS) exam rises in popularity and becomes the preferred high-stakes English Language test. A reliable and valid assessment of language ability of the learners getting entry into the international academic needed for predefined English proficiency had been a required precondition to study oversea (Hashemi & Daneshfar, 2018). IELTS provides and assesses information dealing with English level for the relevant applicants, based on the band score of IELTS testing organization. IELTS is composed of four equally weighted sub-components: listening, reading, writing, and speaking. It is available in two test versions namely IELTS academic and IELTS general training exam. Liao (2019) revealed that the academic exam was intended to those employing for professional purpose, yet the general training exam was aimed at assessing the language proficiency of those migrating to English-speaking country. Both the academic and general training exam gave accurate and valid assessment of four language skills (Mallilin & Gilbang, 2017; Ali, Washahi, & Alhassan, 2020).

Reading section in IELTS included 40 questions all over as well as three different texts designed to assess a wide range of reading skills; these consist of reading for main ideas, reading for gist, reading for details, scanning, skimming, comprehending the logical argument, and recognizing writers' attitude and opinions (Masna, 2016; Liao, 2019; Mirzaei, Heidari Vincheh, & Hashemian, 2020). MacDonald (2019) argued that every passage assigned with 20 minutes and two of the passages had 3 following questions and one of the three had 14 questions. In IELTS reading test, syntax and vocabulary became utmost crucial and it led to be successful performance in the exam (Farid, 2018; Simanjuntak, 2018; Liao, 2019). Mirzaei, Heidari Vincheh, & Hashemian (2020) found that syntax and vocabulary were two reading attributes for the participants. Those aspects were necessary for test-takers' reading so that they comprehended the passage as they had a lot of difficult lexical resources.

Web-based learning or online learning process was basically utilized the internet or intranet network (Liao, 2019; MacDonald, 2019). One form of media supporting the e-learning process is web-based learning multimedia which contains

various applications and learning materials connected online to the internet. It is equipped with various other facilities which facilitate interaction between users and the instructor. According to Sun & Chen (2016) and Aşıksoy (2018), the world wide web, or web referred to basically internet server system which supports formatted document. The document was formatted in markup language mention hypertext markup language (HTML) supporting link to other documents, video files, graphic, or audio. Chatwattana & Nilsook (2017) revealed that web-based learning had a positive effect on learning outcomes and increased cognitive competence and concepts understanding. Similarly, Gunuç & Babacan (2017) argued that the development of web-based teaching materials had been proven to be effective in increasing learners' response and learning outcomes.

Learners found learning by web tools more effective and interesting than traditional method. Another finding, Petrişor, Măruşteri, Ghiga, & Schiopu (2019) indicated that web tool enabled learners to let their dynamic, flexible, and creative learning climate from audial and visual materials. Gunuç & Babacan (2017) concluded the easy to apply, inexpensive, and accessible web impact on language learning was indispensable. Pre-service educators should use the technology to establish positive attitude on pedagogical factors leading to notable contributions to learning progress (Maity & Pednekar, 2018; Roy, 2019)

Recently, Gunuç & Babacan (2017) examined the integration of technology in EFL's teaching and learning. The aim of the study was addressing the significance of online test in teaching learning process of writing skill and introducing the integration of technology for language learning. The finding revealed that technology integration in English learning was great significance in the English skill development such as reading, listening, writing, and speaking. The hardware as well as software technological tool utilized in learning made many contributions both learners and teachers in the repeated used material, availability of materials everywhere and at all time, all time costless or low cost of material, efficient learning in short time, and evaluation for learners' English proficiency. As a result of the research, the integration process of technology needed to be employed consciously and in a planned way to make crucial contribution to the technology and important task for teachers.

Bojovic (2019) and Chen, Hsu, & Chang (2019) researched whether or not web technology

assisted college learners in English writing. The study minded a blended approach combining peer assessment for writing course for first year learners in college. Through the web and blended instructional approach, learners became attentive and willing to convey their own idea and more willing to get interaction with others. Web enabled learners to self-examine, observe, review, and obtain detailed insight of each work. Learners were able to optimize their grammar, organization, content, structure, lexical resources, and mechanics. The use of web could be a feasible approach and learners could continuously gain relevant skill and knowledge through the peer assessment (Panyajamorn & Suanmali, 2018). As the proliferation and development of web let learners more connected and provided access to more information and resources, observing more attractive strategy for English skill became increasingly significant for ESL learners.

Web technology covered rich environment and resources for learners and educators in teaching and learning process (Tekdal, Sayginger, & Baz, 2018). Aşıksoy (2018) carried out research concerning ELT learners' awareness and attitude toward the use of web-online test for English learning. Learners had positive attitude toward the tools and they were more aware of the existence of web tool used in English learning process. Web motivated learners to be self-regulated learning and supported them in independent individuals assessing learning goals.

The current researches were attempts to establish the theoretical framework for this study. There was similarity between researches stated above and this study. The previous researches concerned the use of web in EFL's teaching and learning. In this study, the development of web is to evaluate IELTS Academic Reading test. Instead of similarity, there was also difference. The past researches were carried out in Writing skill; this study is conducted to develop web for IELTS Academic Reading Test.

The technology that entered every area day by day has already affected the field of education; traditional method had become unable to meet the expectation. Especially when digital native learners preferred to study in technological environment, it was crucial to utilize technology in education environment (Gunuç & Babacan, 2017; Sudarsana, Nakayanti, Saptia, Haimah, Satria, Saddhono, Mursalin, 2019; Nagasubramani, 2018). In the midst of the development of science and technology, the

demand for mastery foreign languages cannot be avoided and even becomes an obligation. To measure the test takers' English proficiency, various tests are created to certify their ability and one of them is IELTS. The limited online IELTS test prevents users to their language skills. Based on this needs analysis, the researcher sees the need for a web-based IELTS online test which facilitates users to assess their language skills.

Web-based IELTS online test is only available on limited access; academics' IELTS ability cannot be measured optimally. Supported by the availability of internet network owned by each user, researcher is motivated to develop a web-based IELTS online test system which can be accessed anytime, anywhere. Web-based online IELTS test is crucial to be investigated in order to provide more precise and effective English exams. Hence, learners can evaluate their English proficiency as well.

In this development research, an online reading IELTS test has been produced; a web-based test can be accessed through the portal address/URL: <https://gets.unida.gontor.ac.id/pertanyaan/quiz>. This web-based online test is developed through the PHP programming using Notepad ++ software, together with views compiled from HTML code, CSS templates, and Adobe Flash CS3. The present study, therefore, aims at addressing two specific concerns: facilitating web-based online test system for IELTS academic reading test and identifying student learning outcome after IELTS online test is employed. The project goal is designed to assist students optimize academic competence and to provide an application accommodating the needs of the IELTS reading proficiency test with an open access system.

METHOD

This existing research aims at developing an online test designed for IELTS academic reading test and developed with PHP programming. The model used in the development of this product was a research and development model adopted from Alessi & Trollip model. The three-attribute of Alessi and Trollip Instructional System Design (ISD) which were always presents: standard, evaluation, and project managements. Those were the principle minded in the design and development process, and they established better foundation. Clearing the standard, the design development was monitored to operate the benchmark. In addition, ongoing evaluation was applied at each phase whereby the approach of

continual iterative was implemented until the functionalities could be achieved (Por, Mustafa, Osman, Phoon, & Fong, 2020). The development meant flexible and the step depended on the previous step result. Another emphasis in Alessi & Trollip ISD model was project management in order to check the online test completed within the time, frame, and the allotted budget. Slippage could be covered while maintain the standards (Por & Fong, 2011). Alessi and Trollip model was illustrated in Figure 1 below.



Figure 1. *The Alessi and Trollip instructional system design model (2001)*

Three-phase of Alessi and Trollip (ISD); planning, design, and development were also utilized in the development of web-based online test system for IELTS academic reading test. Planning was carried out to ensure the system aspect run smoothly. Planning phase covered defining the scope of this study, identifying learners' characteristics, determining the boundaries of web-based online test, deciding the produce-style manual and also conducting initial brainstorming (Alshammari, 2016). Besides, design phase was the most creative as it referred to the content assembling and it needed to decide how the test online system was treated from interactive and instructional perspective which assisted learners archived the learning outcome (Lestari, 2019). The design phase included conducting task and concept analysis and making flowcharts and storyboards for online test. The last phase was taking the design and turning it into web-based online system for IELTS reading test. The development was the collaborative process as it required preparation and reading text production together with the support material

development. It demanded skill variety and overall process such as writing program and creating the graphics.

Developing web-based online test system for IELTS academic reading test, product testing was divided into two types: test to determine the feasibility of web-based online test system and to examine the effectiveness of online test system. To test the feasibility of a product, both an alpha test (validation of material and media experts) and a beta test (learners' test) were carried out. The data obtained were then analyzed to enhance the product being developed. Through this trial process, the quality of the media developed could be more suitable for learners. The product effectiveness testing was undertaken through summative evaluation in order to determine whether there was gain score or an enhancement of learners' motivation and achievement after the implementation of developed product.

Subject of research

The test subjects in this summative evaluation test were 30 learners from semester 1 majoring in International Relations of Darussalam Gontor. Whereas for the formative test at both alpha and beta test, the subjects tested were 10 international relations learners. Selection of trial subjects was based on their academic abilities.

Instruments

Producing a quality development product required a quality instrument exploring the research process. The instruments covered: (1) the main instrument, consisting of a questionnaire instrument to assess the quality of multimedia web-based learning developed both in terms of material and media validated by material and media experts and the band score of IELTS reading test to find out to what extent the cognitive learning outcomes enhanced. Through the test instrument, both learners' pre-test and post-test could be evaluated; (2) supporting instruments, observation sheets were utilized to explore learners' characteristics in order to achieve the accuracy of the design and product. Through product developers' interview, additional information including suggestions, criticism, and input outside of questionnaire were invaluable during beta testing.

Data gathering

There were some data in the existing research: the validation results of media experts, material experts, questionnaires on the developed web, and

learners' questionnaire on multimedia products converted into a scale of 5 numbers, their motivation together with pre-test and post-test scores of learners' learning outcomes.

Data analysis procedure

The criteria of assessing the quality of material on web-based test online: IELTS reading test included instructional quality (instructional flexibility, quality of testing, and assessment) and quality of content and goals (accuracy, completeness, interest, and appropriateness to user's situation). The criteria of assessing the quality of web-online test adapted from Alessi & Trollip were display aspect quality (text or letters, colors, images/graphics, animation, screen design, and navigation) and technical quality (interactivity, communication features, privacy and data storage, compatibility of media, accessibility and stability, program boundaries, and non-web contact information). On the other hand, evaluating learners' impressions of web multimedia dealt with media attractiveness such as text or letters, colors, images, screen design, material & tests, communication features, user interface, and language.

In formative evaluation, questionnaires and direct interviews with media and material experts were then summarized in a table that was not converted into quantitative data as the experts only provided suggestions and input regarding the developed web-based online test. In contrast, in summative evaluation, the learning motivation questionnaire were analyzed into a numerical scale using a Likert Scale, while the pre-test and post-test data were compared to see if there was an enhancement in learning outcomes. Learning outcomes improvement prior and after web-online: IELTS reading test implementation was calculated by N-gain based on the normalized average score gain (g). The gain score was the score obtained from the pre-test and post-test; the maximum gain score was the highest gain score. According to Hake (2011), the normalized average gain (N-gain) was conveyed:

$$g = \frac{S_{post} - S_{pre}}{S_{maks} - S_{pre}}$$

Where the final (post) and initial (pre) class averages:

High-g courses as those with $(N\text{-gain}) \geq 0,7$

Medium-g courses as those with $0,7 < (N\text{-gain}) \geq 0,3$

Low-g courses as those with $(N\text{-gain}) < 0,3$

FINDINGS AND DISCUSSION

Planning

Define the scope

As a high-stakes standardized test, IELTS was employed to reach comparable forms of test worksheet; thus, the participants form on different dates gained comparable test scores. Three IELTS academic reading tests were utilized in the present study: basic, independent, and proficiency level. Each level of reading test was composed of three reading passages along with 40 test items and each reading text format contained three tasks which altogether consisted of 14 or 13 items. These three materials were the main material that can be the basis for conceptual understanding in understanding the IELTS test as a whole.

Identify learner characteristics

At the developmental age of the formal operational stage (11-20 years), learners' thinking patterns had developed to be more logical. Learners were able to interpret a concept, develop a hypothesis, and draw conclusions on the explanation given. In general, their uniqueness was that they like current and sophisticated things. They were accustomed to learning independently using the internet to find out current matters. Notebooks and cellphones were utilized as a means of recording the material. Based on the observations of these characteristics, the present study developed a web-based online test for IELTS academic reading test that suited their characteristics at the formal operational stage along with facilitated learning English proficiency.

Establish constrains

From a developer perspective: Hardware specifications required to develop web-based IELTS online test were: PC / laptop / notebook computers (Pentium Processor, 1 Gb RAM, minimum resolution of 1366 x 768, minimum VGA 32 bit, speaker, operation system: windows XP, vista, windows 7, MAC OS); internet network with a minimum bandwidth of 256. Likewise, software used in multimedia development included web browsers such as Mozilla Firefox, Opera Browser and Google Chrome, Adobe Flash CS 3, Adobe Photoshop CS3, Notepad ++, Corel Draw X4, Adobe Illustrator. In terms of users: the specifications to access web-based IELTS were: PC / laptop / notebook computers (Pentium Processor, 1 Gb RAM, minimum resolution of 1366 x 768, VGA at least 32 bit, Speaker, and Operation System:

Windows XP, Vista, Windows 7, MAC OS); internet network with a minimum bandwidth of 256 kbps; equipped with a web browser such as Mozilla Firefox, Opera Browser, Google Chrome; and Adobe Flash.

Produce a style manual

(1) The layout of this website consisted of 6 main menus, including the Homepage, Course-page, Test-page, Info-page, Forum-page, and Log-in page. Especially in the test-page section, the web layout design was made separately for each level of questions, with the aim at generating a learning atmosphere. (2) The typeface employed in the text was the Courier New and Pristine theme fonts, with a font size of 12pt in the material text and 16pt on the homepage text and the material title. (3) The theme chosen in the website template design was modern futuristic with a minimalist template design without the use of striking icons or characters. (4) The basic colors used in the web-site template were light blue and white. (5) This web-based online test was accessible; users just entered the user name. (6) The navigation buttons in this web-based online test were created as attractive as possible by promoting a modern, futuristic theme.

Design

Conduct task and concept analysis

The web-based IELTS online test aimed at optimizing reading skills. The web-based online test was an interactive test media accessed by users wherever they were for independent study. The web had been combined with macromedia flash, an application to create attractive animations and websites. This test also encouraged students as users to learn independently and change teacher-centered learning to student-centered learning; thus, it improved their performance and achieved mastery. The text in reading had been attributed to the size of words in a text, length of sentences, and linguistic features including cohesion and narrativity. The task type available on the existing web-based IELTS online test were matching heading, multiple choice, matching information, True/False/Not Given, summary completion, sentence completion, short-answer questions, and Yes/No/Not Given.

Create flowcharts and storyboards

Web-based online test flowcharts described the basic flow or process sequence of web multimedia work systems when accessed by the user. The

flowchart creation was followed by the creation of a web multimedia product storyboard. Storyboard included the initial design or visual design of the product. In this phase, the main menu design,

website logo, material display and test page, as well as other features were determined. The flowchart below illustrates the procedure for using the web-based online test.

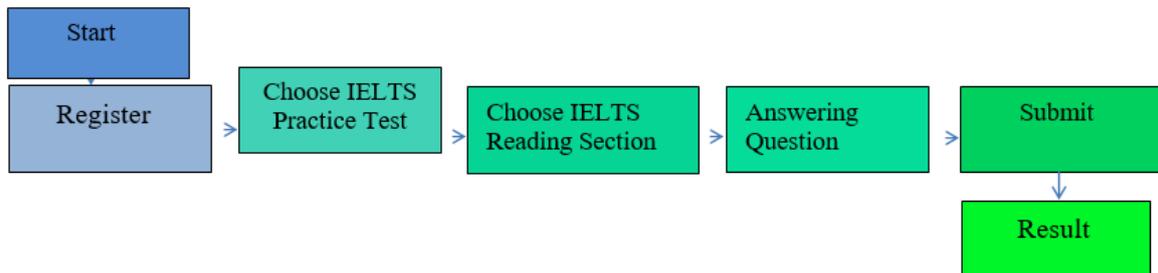


Figure 2. The procedure for accessing web-based online test

Development

The web-based online test for academic IELTS reading test was set up through the PHP coding system or PHP programming and equipped with a website programmer, Adobe Flash CS 3 application, Adobe Photoshop CS3, Notepad ++, Corel Draw X4, and Adobe Illustrator. The initial stages of development began with preparing the academic reading material for the test and determining the display design together with menu content. Furthermore, web-programmers initiated the coding system process referring to the predefined flowcharts and storyboards. At this stage, Role Based Access Control (RBAC) was also established. In this multimedia web, user roles were divided into 3: administrator (web manager), lecturer, and user (learners or general users). After the coding and merging process of each media component was established, the server and website domain were settled: <https://gets.unida.gontor.ac.id/pertanyaan/quiz> as the address for the website being developed. The following was a profile of the web-page of web-based online test:



Figure 5. IELTS score

After the multimedia learning of web-based online test: IELTS academic reading test had been developed, evaluating the feasibility of the product prior being used in the learning process was implemented. Product feasibility evaluation known as formative evaluation consisted of 2 stages of testing: alpha testing (product validation) and beta testing (user impression). In the alpha testing, validation was mainly conducted by the testers who were internal media experts and IELTS expert. Material expert validation validated the suitability of the material content. Similarly, media validation aimed at evaluating aspects of display and media programs.

Further examination of the validation result showed that the test coverage developed in the web-based online test had met the validity term of the IELTS reading test. The assessment from media experts revealed that the indicators related to each component had been achieved. Meanwhile, media validation result indicated clearly that media components identified as not meeting the criterion standard in terms of appearance and media accessibility aspects. In general, the web-based online test could still be utilized in the learning process; some improvements were needed to obtain feasible web multimedia product. Having been fixed, a web-based online test system was desirable to be tested



Figure 4. Types of questions

Table 1. *Result of media expert assessment*

No	Aspect	Score
1	Management	4.42
2	Screen Display	4.35
3	Benefit	5.41

Pertinent to the feasibility test carried out by media expert, the management aspect of online test achieved 4.42 (very good category) and the screen display was 4.35 (very good category). Dealing with the benefit of web-based online test, media experts defined 5.41.

Having tried out each of the reading practice, the material experts evaluated the products. They conveyed their point of view into two categories i.e. the practicality and the effectiveness of materials. The practicality as indicated by the ease of accessing the IELTS practice reading test on web and employing it in the IELST reading class and the effectiveness was characterized by usefulness of materials for IELTS reading class. Based on the data gathered from material experts, they considered that kind of genres found in reading text exceeded 4.21 (very good category). On the other hand, the conformity between reading text and curriculum was 3.79 (good category), and the arrangement of reading test based on level of difficulty reached 4.18 (very good category).

The research instrument in the beta test was a questionnaire of media attractiveness. Learners were then asked to learn and observe all the contents of the web-based online test for IELTS reading test. As the learning activity was deemed sufficient, learners faced test to measure their performance in reading. An impression questionnaire on the web multimedia was also distributed to learners; Likert Scale was used to analyze the resulting data (see table 1)

Table 2. *Result of an impression questionnaire on web multimedia*

No	Aspect	Score
1	Clarity of the text	4.46
2	Color combination	3.86
3	Menu presentation	4.33
4	Web instruction	4.33

Referring to the learners' impression, clarity of text obtained an average score of 4.46 (very good category), color combinations on the web got a score of 3.86 (good category), menu presentation got a score of 4.33 (very good category), and the instructions for using the web derived a score of 4.33 (very good category). These results indicated

that there was an increase for the gain score of 0.40 (Medium-g courses); hence, web-based online test was sufficient to optimize learning outcomes.

In addition to the data obtained from the pre-test and post-test, data related to motivation for learning was also carried out for summative evaluation. The attitude questionnaire was in the form of qualitative data and it was converted into quantitative data using a Likert number scale conversion. The pre-test performance of learners' motivation was up to 2.03. Meanwhile, the mean score of the post-test stage was 3.53. The results of the two means were then compared so that the gain score was derived. The gain score aimed at determining the significance difference in the motivation level prior and after the web-based online test utilization. From the average score, the gain for learner motivation scale was 0.38 (Medium-g courses). Therefore, learning motivation enhanced after learners employed the web-based online test for IELTS academic reading test.

In the summative evaluation, a classroom trial was conducted using a web-based online test involving 30 students. Prior to utilizing the web-based online test for post-test, the offline pre-test was held to determine the learner's cognitive ability in academic IELTS reading test. In case 80% of learner passed the minimum standard of band score (6.5), the materials of reading were proper for learners in the term of level of difficulty. Based on learners' pretest scores, only 65 % of learners passed the band score. However, the post-test defined that most learners passed it. Only 3 learners were considered incomplete at the post-test. Based on the increase in learning outcome, then the gain score obtained was interpreted on the effectiveness of the web-based online test for IELTS reading text. Concerning the results of the mean score of pre-test and post-test, a gain score represented 0.43 and it fell into medium-g courses. Thus, this web-based online test could enhance learners' reading test performance.

Discussion

Many of us used web or internet as reliable source of information. In education, the web was increasingly employed as learning tool to support the program and as a mean to deliver online learning teaching. Web-based online test brought with more opportunities to get innovative around assessment. Online test when minded efficiently, could be valuable assessment of twenty first

century learning; it was designed to align with the powerful assessment concept through selecting the question format, approach of philosophy embedded in the question, and cognitive level of question

This research has revealed that web-online test: IELTS academic reading enables to give performance among learners. As a product of development, the benefits of utilizing web-based online test were plenty. Web technology offered unique opportunities for learners to become more engaged with learning beyond the boundaries of learning management. The existing web-based online test, the access anytime, anywhere construct served an attractive and attractive appearance. The benefits went in line with several research conducted in other places where learners enhanced the learning experience; they accessed to the test which was not available in the class (Ashraf, 2016; Chaplot, 2016; Boitshwarelo, Reedy, & Billany, 2017; Permatasari, Ellianawati, & Hardyanto, 2019).

The website template had been different from other websites as it was developed with a dynamic programming language. The attractive display was showcased in form of the test menu presentation, i.e. exercise menu feature. Similarly, the online test was presented with a drag and drop model which was very attractive and interactive to attract learners' attention and these characteristics could not be provided. This study revealed that the existence of an online web-based online: IELTS academic reading test was able to provide a more precise and effective English test so that users, especially learners, could evaluate their English proficiency. Online test can measure learners' academic performance is also reflected in other studies (Boitshwarelo *et al.*, 2017; Hashemi & Daneshfar, 2018; Verma, 2018).

The drawback of this research was this web-based online test was not equipped with personal chat facilities to communicate with other users. This product could only be accessed online by users with an adequate internet network. The available bandwidth/internet network availability also affected the smoothness of access to the website so that it could hinder the online test process. Other studies also indicated that online test system relied on internet connection together with software and if any of them failed, learners were not able to give the exam (Chaplot, 2016; Nagasubramani, 2018) and the progress of test data might be deleted in case the system off suddenly (Asiksoy, 2018; Tekdal *et al.*, 2018). In addition, the scope of material in web-based

online test was only limited to reading skills and did not yet cover all skills in IELTS. This became an input for developers to design an online IELTS test with listening, writing, or speaking skills.

CONCLUSION

Online test becomes more familiar in the digital century to measure the participants' knowledge on given topic. With online test system, learners do the test online, in their own time, with their own device regardless of where they stay. They only require an internet connection and a browser. Based on the results of the validation of the IELTS and media experts, web-based online test is quality declared feasible to use. Regarding the assessment of learners' impressions of web-based online test, the gain score obtained is 0.43 with medium-g courses. Similarly, the summative evaluation results of using web-based online test also enhance the learners' engagement and learning outcomes. 80% of learners passed the minimum standard of band score (6.5) in the post-test; reading materials were proper for learners in the term of level of difficulty. Acknowledging the findings above, the web-based online test developed is appropriate for assessing IELTS reading skill.

The finding of this research can assist lecturers in developing the web-based online test. Conducting this study, there are a number of limitations resolved in further research. This research could be replicated by various testing methods, other language skills, and different language proficiency levels. Here are further recommendations: a) other studies may examine further research to develop web-based online test for academic and general IELTS listening by exploring the same methodology; b) the lecturers are suggested to employ this product of this research as academic IELTS reading practice tests developed using Research and Development design; and c) prior to applying the product, lecturers are recommended to encourage their learners to be relaxed experiencing IELTS reading practice test; they will not be panic missing something in their practice.

REFERENCES

- Alessi, S. M., & Trollip, S. R. (2001). *Multimedia for learning: Methods and development* (3rd ed.). Boston: Allyn & Bacon.
- Ali, H. I. H., Washahi, Q. Al, & Alhassan, A. (2020). Unpacking the challenges and accommodation strategies of Omani English-Major students on IELTS academic reading tests. *Journal of*

- Language and Linguistic Studies, 16(3), 1621–1636. <https://doi.org/10.17263/jlls.803922>
- Ashraf, A. (2016). Analyzing characteristics of reading test tasks designed for undergraduate language assessment. *Journal of Independent Studies and Research-Management, Social Sciences and Economics*, 14(1), 89–104. <https://doi.org/10.31384/jisrmsse/2016.14.1.7>
- Aşıksoy, G. (2018). ELT students' attitudes and awareness towards the use of Web 2.0 technologies for language learning. *Journal of Language and Linguistic Studies*, 14(2), 240–251. Retrieved from www.jlls.org
- Boitshwarelo, B., Reedy, A. K., & Billany, T. (2017). Envisioning the use of online tests in assessing twenty-first century learning: a literature review. *Research and Practice in Technology Enhanced Learning*, 12(1). <https://doi.org/10.1186/s41039-017-0055-7>
- Bojovic, M. (2019). Reading skills and reading comprehension in English for specific purposes. *The International Language Conference on The Importance of Learning Professional Foreign Languages for Communication between Cultures 2010*, (September 2019), 1–5.
- Chaplot, V. (2016). Review of online examination system. *International Research Journal of Engineering Technology*, 3(7), 886–888.
- Chatwattana, P., & Nilsook, P. (2017). A web-based learning system using project-based learning and imagineering. *International Journal of Emerging Technologies in Learning*, 12(5), 4–22. <https://doi.org/10.3991/ijet.v12i05.63>
- Chen, Hsu, & Chang. (2019). Using radical derived character e-learning platform to increase learners knowledge of Chinese character. *Language Learning and Technology*, 17 (1), 89–106.
- Farid, A. (2018). Designing IELTS writing material for learners with low level of English proficiency based on need analysis. *Journal of Research in Foreign Language Teaching*, 7(1), 23–34.
- Gunuç, S., & Babacan, N. (2017). Technology Integration in English language teaching and learning. *The Journal of Teaching English for Specific and Academic Purposes*, 5(2), 349–358. <https://doi.org/10.22190/JTESAP1702349G>
- Hake, R. (2011). The impact of concept inventories on physics education and its relevance for engineering education. *Proceedings of The National on STEM Concept Inventories*.
- Hashemi, A., & Daneshfar, S. (2018). A review of the IELTS Test: Focus on validity, reliability, and washback. *IJELTAL (Indonesian Journal of English Language Teaching and Applied Linguistics)*, 3(1), 39. <https://doi.org/10.21093/ijeltal.v3i1.123>
- Lestari, S. A. (2019). The development of web learning based on project in the learning media course at IAIN Kendari. *Jurnal Pendidikan Islam*, 5(1), 39–52. <https://doi.org/10.15575/jpi.v5i1.2909>
- Liao, L. (2019). A comparability study of text difficulty and task characteristics of parallel academic IELTS reading tests. *English Language Teaching Journal*, 13(1), 31–43. <https://doi.org/10.5539/elt.v13n1p31>
- MacDonald, J. J. (2019). Sitting at 6.5: Problematizing IELTS and admissions to Canadian Universities. *TESL Canada Journal*, 36(1), 160–171. <https://doi.org/10.18806/tesl.v36i1.1308>
- Maity, P. & Pednekar. (2018). Online examination system. *International International Research Journal of Engineering and Technology*, 5(3), 1956–1959. <https://doi.org/10.26438/ijcse/v6i7.745749>
- Mallilin, L. L. D., & Gilbang, C. S. (2017). Effectiveness of IELTS module in the General English language under the international foundation programme. *International Journal of Physical and Social Science*, 7(7), 19–35.
- Masna, Y. (2016). The IELTS reading test: A review on its development and language test performance. *Journal of Teaching and Learning*, 3(2), 65–76.
- Mirzaei, A., Heidari Vincheh, M., & Hashemian, M. (2020). Retrofitting the IELTS reading section with a general cognitive diagnostic model in an Iranian EAP context. *Studies in Educational Evaluation*, 64(2)
- Nagasubramani. (2018). Impact of modern technology in education. *Recent Trend of Teaching Methods in Education Conference*, 3, 33–35. https://doi.org/10.4324/9780203168899_chapter_10
- Panyajamorn, Titie, & Suanmali. (2018). Effectiveness of e-learning design and affecting variables in Tahi public school. *Malaysian Journal of Learning and Instruction*, 15(1), 41–50. <https://doi.org/10.1080/08832323.2013.869530>
- Permatasari, G. A., Ellianawati, E., & Hardyanto, W. (2019). Online web-based learning and assessment tool in vocational high school for physics. *Jurnal Penelitian & Pengembangan Pendidikan Fisika*, 5(1), 1–8. <https://doi.org/10.21009/1.05101>
- Petrişor, M., Măruşteri, M., Ghiga, D., & Schiopu, A. (2019). Online assessment system. *Applied Medical Informatics*, 28(1), 23–28. Retrieved from <http://search.ebscohost.com.bibl.proxy.hj.se/login.aspx?direct=true&AuthType=cookie,ip,uid&db=afh&AN=59759726&site=ehost-live>
- Por, F. & Fong, F. S. (2011). Towards transformation: The power of phonetic symbols embedded in a multimedia learning management system. *English Language Teaching*, 4(1).
- Por, F. P., Mustafa, Z., Osman, S., Phoon, H. S., & Fong, S. F. (2020). Design and development of multimedia pronunciation learning management

- system for non-native English speakers. *Procedia - Social and Behavioral Sciences*, 64, 584–593. <https://doi.org/10.1016/j.sbspro.2012.11.068>
- Roy, A. (2019). Technology in teaching and learning. *International Journal of Innovation Education and Research*, 7(4), 414–422. <https://doi.org/10.31686/ijier.vol7.iss4.1433>
- Simanjuntak, A. E. W. (2018). The effect of test preparation TOEFL reading tests. *Globish: An English-Indonesian Journal for English, Education, and Culture*, 7(2). <https://doi.org/10.31000/globish.v7i1.844>
- Sudarsana, I. K., Nakayanti, A. R., Sapta, A., Haimah, Satria, E., Saddhono, K., Mursalin, M. (2019). Technology application in education and learning process. *Journal of Physics: Conference Series*, 1363(1). <https://doi.org/10.1088/1742-6596/1363/1/012061>
- Sun, A., & Chen, X. (2016). Online education and its effective practice: A research review. *Journal of Information Technology Education: Research*, 15(2016), 157–190. <https://doi.org/10.28945/3502>
- Tekdal, M., Saygıner, Ş., & Baz, F. Ç. (2018). Developments of web technologies and their reflections to education: A comparative study. *Journal of Educational and Instructional Studies in the World*, 8(1), 17–27. Retrieved from http://www.wjeis.org/FileUpload/ds217232/File/03.mehmet_tekdal.pdf
- Verma, G. (2018). Smart assessment system by means of online exam system. *International Journal for Scientific Research and Development*. 6(2).3456-3459. <https://doi.org/10.12738/estp.2013.3.1580>