استخدم منصة تعلم إلكتروني معدلة لتنمية القراءة الناقدة والكفاءة الرقمية لدى طلاب كلية التربية تخصص اللغة الإنجليزية

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مستخلص. تعد الممارسات التعليمية المعدلة حجر الزاوية للتدريس الفعال في تخصص اللغة الإنجليزية كلغة أجنبية. ولأن جهود الإصلاح التربوي في الفترة الأخيرة التي تعتمد على التدريس المعدل في سياق اللغة الإنجليزية تنطوي على العديد من الصعوبات، تحاول الدراسة الحالية المساهمة في هذا المجال حول تأثير التدريس والتعلم المعدل لتحسين القراءة الناقدة والكفاءة الرقمية لدي معلمي اللغة الإنجليزية كلغة أجنبية. وتهدف الدراسة إلى تحديد فعالية استخدام منصة تعلم إلكتروني معدلة لتنمية القراءة الناقدة والكفاءة الرقمية لدى طلاب كلية التربية تخصص اللغة الإنجليزية. واعتمدت الدراسة على التصميم شبه التجريبي القبلي–البعدي ذو المجموعتين. وتم إعداد برنامج باستخدام منصة التعلم الإلكتروني المعدلة بواسطة الباحثة. وتكونت عينة الدراسة من (٨٠) طالب وطالبة بالفرقة الثالثة بكلية التربية بجامعة المنيا تخصص اللغة الإنجليزية، مقسمين إلى مجموعتين متساويتين في العدد (٤٠ لكل مجموعة). واعدت الباحثة أداتين لجمع البيانات الخاصة بالدراسة وهما اختبار القراءة الناقدة واختبار الكفاءة الرقمية. وكشفت النتائج عن فاعلية البرنامج في تنمية مهارات القراءة الناقدة والكفاءة الرقمية لصالح أفراد المجموعة التجريبية في الاختبار البعدي. وتمت مناقشة هذه النتائج وتقديم التوصيات ومقترحات الأبحاث المستقبلية في ضوء الاتجاهات الحديثة حول دور التعليم المتفرد. وخلصت الدراسة إلى أن التدريس المعدل بمساعدة التكنولوجيا يمكن أن يكون مدخلاً بديلاً وفعالًا يناسب احتياجات وقدرات المتعلمين، حيث يسعى هذا المدخل إلى تحقيق هدف رئيسي لبرامج تعليم المعلمين يتمثل في توفير ببيئة تعليمية تفضي إلى تعلم اللغة الأجنبية بطريقة فعالة من خلال تنمية القراءة الناقدة والكفاءة الرقمية.

الكلمات المفتاحية: التدريس المعدل، منصة تعلم إلكتروني، القراءة الناقدة، الكفاءة الرقمية، الطالب المعلم تخصص اللغة الإنجليزية كلغة أجنبية

Using An Adaptive E-learning Platform to Develop Faculty of Education EFL Majors' Critical Reading and Digital Competence

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Abstract Adaptive instructional practices are considered a cornerstone of effective EFL pedagogy. Given that recent educational reform efforts implementing adaptive teaching in the foreign language context have been particularly difficult, the current study attempts to contribute to the literature on the effect of adaptive teaching and learning on improving EFL student teachers' critical reading and digital competence. It aims at identifying the effectiveness of using an adaptive e-learning platform to develop Faculty of Education EFL majors' critical reading and digital competence. The research follows the quasi-experimental two-group pre-post design. A program using an adaptive e-learning platform was prepared by the researcher. The research sample consisted of (80) male and female Minia University Faculty of Education third-year English majors divided into two equal groups in number (40 for each group). Two instruments were prepared by the researcher and used to collect data for the study. These instruments were the critical reading test and the digital competence test. The findings revealed the effectiveness of the program in developing the experimental group participants' critical reading and digital competence, as indicated by the statistically significant improvement of their scores in the post-tests. These findings were discussed, and recommendations and suggestions for further research were made in relation to the ongoing debate regarding the role of personalized education. It is concluded that adaptive pedagogy with the help of technology could be an alternative and effective approach to suit the learners' needs and abilities.

Keywords: adaptive pedagogy, e-learning platform, critical reading, digital competence, EFL majors

Introduction

Reading is one of the four main skills that EFL learners need to master to successfully learn the language. It is a selective, purposeful, and comprehensive process. The ultimate goal of reading is to extract and comprehend meaning from what is being read. Besides, reading is an important lifelong learning skill to enhance other EFL skills such as vocabulary, grammar, and writing. When students read, their cognitive, linguistic, and sociocultural competencies can benefit from the intellectual processes involved in reading. Reading critically means embracing different points of view with an open and inquiring mind, evaluating one's own position, and drawing conclusions as to whether a particular point of view is persuasive. Critical reading is an analytical skill that shows the reader how to recognize what a text means. Being critical readers does not necessarily mean criticizing what is read. Critical reading refers to presenting reasoned arguments which evaluate and analyze what has been read. While reading, the reader explores different authors with different views. The job of a critical reader is to discover all these views to highlight awareness of all related issues. Critical readers should go beyond literal and interpretative texts.

Although critical reading skills are essential for EFL learners, it is difficult to acquire critical reading ability. Kobayashi (2007) indicated that critical readers produce notes while reading compared to non-critical readers who just make a summary of the text. Icsmez (2009) highlighted that when students are clearly taught about critical reading, not only their critical reading ability is developed, but also their motivation in reading is increased. Giving the appropriate reading texts to students would foster their critical reading ability effectively (Tsai, 2013). However, many studies reveal that students are low in their critical reading ability. Karaby (2015) found that critical readers take

critical notes while reading texts and underline the most valuable and important information.

It is argued that critical reading is an active, reflective, careful, and analytical skill to judge the value of the text. Critical readers use their higher-order thinking skills to tackle and evaluate the content of reading text. They go beyond grasping what is explicitly mentioned or stated in the texts. EFL teachers should use appropriate teaching activities to enhance students' critical skills in reading. EFL students need to be taught critical reading to improve and develop their analytical and inferential skills in reading. Some previous studies focused only on micro-skills of critical reading abilities. Zig, Eng, and Rafik Gakea's (2014) study was limited to determining two critical reading skills, including identifying the writer's purpose and main idea and making inferences. Another study by Khodary and Abdallah (2014) recommended that the EFL students who were described as low-critical readers need further investigation.

Digital competence is about having the skills one needs to live, learn, and access information through digital technologies such as internet platforms, social media, and mobile devices. Digital competence enhances students' rapid development in technology and society in online communication. Ojeda & Gardener (2013) indicated that personalized content in online education can improve student performance. The importance of digital literacy is increasing (Riddle, 2015), and the use of digital technologies is highlighted by a lot of research studies (Godwin-Jones, 2016).

Undergraduate students should take advantage of flexible learning and distance education. They are expected to have a basic level of digital literacy to cope with twenty-first-century academic education and work. Therefore, it is important to support the development of digital literacies and online skills (Yang, Catterall; Davis, 2013). Digital

competence includes "plurality of understanding and skills" (Brown, 2014, p. 284), such as information, visual, technological, and media literacies (Martin, 2006), hypermedia and photo visual literacies (Aviran & Eshet-Alkalia, 2006) and games literacy (Schott & Selwyn, 2011).

There is a need to develop digital literacy in EFL classrooms. Martin (2005, p. 135-136) stated that "digital literacy is the awareness, attitude, and ability of individuals to appropriately use digital tools to identify, access, manage, integrate, evaluate, analyze and synthesize digital resources, construct new knowledge, create media expressions and communicate with others in the context of specific life situations in order to enable constructive social action and to reflect upon this process".

Recently, adaptive e-learning has gained a lot of research attention to promote students' learning and skills (Li, 2010; Yang, 2013; Morgin, 2016; Villesseche, 2017). The "One size fits all approach" adopted through traditional education systems and how to deal with students in the same way may cause many problems because many students have different learning styles, characteristics, knowledge, goals, and preferences. Traditional learning should be replaced with up-to-date adaptive and personalized online learning systems. Adaptive online learning can be tailored in response to students' individual differences and needs.

Li (2010) asserted that adaptive learning is mainly based on constructivist and cognitivist theories. It is an active learning approach in that learners monitor and choose the most suitable learning content and strategies according to their actual needs. Adaptive learning is the way of learning in which learners can get knowledge and skills through positive thinking and operations. Francois (2011) stated that

adaptive learning is based on using technology to help students in individualizing their learning process.

It is indicated that online learning, in the field of teaching and learning English, can increase students' achievement in EFL reading, writing, vocabulary, grammar, and critical thinking (Zang, 2007; Isa, 2012). Murry and Perez (2015) highlighted that the application of technology in EFL learning facilitates real-time dynamic learning based on students' individual differences.

Adaptive pedagogy

An adaptive learning system is a new approach that can make an e-learning system more effective by adapting the presentation of information and overall linkage structure to individual users in accordance with their knowledge and behavior (Yang, 2013). According to individual differences among learners, some students explain why they find it easy to learn online, while others find it difficult. The impact of adaptive learning on education outcomes plays an important role in shaping students' learning experiences. Esichaikul (2011) pointed out that the main goal of adaptive learning is to gain the best results of learning by providing the right content at the right time. The advantages of the adaptive learning system are presenting the learning content in various ways, providing students with learning that fits their different prerequisites, providing different activities for each objective, and providing learners with control over the learning content.

Adaptive learning raises the learning ability by customizing the learning materials to meet students' needs and delineating them directly to the learning domain. In the last few years, e-learning has been growing fast among different educational institutions, i.e., universities, schools, and organizations, before clarifying adaptive e-learning importance and its use in EFL classrooms. This study presents a brief overview of the field of e-learning. Recently, adaptive learning

for learners has become familiar in education. The two main types of adaptive e-learning approaches are macro and micro. The first type is a macro adaptive approach which controls adaptation by giving different alternatives for the learning objectives, curriculum content, and systems based on students' cognitive or learning styles and abilities (Angeli et al., 2015).

This type was characterized by two essential points,: diagnostic of learners' needs, providing instructional prescriptions for them, and achieving different learning objectives to suit individual students' needs or abilities. The second type is a micro-adaptive approach that diagnoses learners' specific learning needs during the learning process. The main difference between macro and micro is that micro relies on tasks rather than pre-task. It uses the temporary nature of learners' abilities and characteristics. It adjusts learning content and presentation during instructions on the basis of students' responses during sessions. On the contrary, the macro is used after larger segments of instructions.

Two main types of adaptation systems were mentioned by (Delgado & Clark,2019). The first type was the adaptive presentation in the platform means the adaptation of the content presentation and the way texts are adapted and presented to learners using multimedia suitable to different learners' styles and preferences. The second type was adaptive navigation which referred to the adaptation of the links that facilitate and change the forms of the education content according to learners' goals, styles, and abilities.

The adaptation of the e-learning environment should be well-designed to suit learners' needs and styles. An adaptive e-learning platform depends on constructing a model of individual learners' needs, preferences, and styles, as Qazadar et al. (2015) mentioned. The well-organized and designed content can enhance learners' development

and performance and improve the learning quality (Shi et al., 2013). The features of adaptive e-learning environments are diversity, interactivity, adaptability, feedback, performance, and predictability. Adaptability means the adaptation of the content, the presentation, and navigation to achieve the educational needs and suit learners' styles and abilities.

E-learning platform

Walker (2015) explained that it is essential to integrate online learning and adaptive learning in the higher educational system. Adaptive learning systems tailor the learning content to suit students' preferences, feedback, and assessment tools. Vidakis (2019) mentioned that the usage of technology and networks could assist teachers and students in gaining personalized learning and emphasis on digital platforms and educational systems. Maravanyika (2017) said that using traditional methodologies cannot offer adapted content based on learners' needs and preferences. As mentioned by Hurtado,2018 World Wide Web and information technology played a crucial role in the educational process, especially in higher education.

The E-learning environment is the development approach that changes the concept of developing e-learning to adaptive e-learning. It is the learning process that the content is adapted to suit learners' learning styles and preferences (Oxman & Wong,2014). Stockely (2006) defines E-learning as the delivery of e-learning or education courses using electronic means. These electronic means refer to any device that can be linked by networks such as radio broadcasts, e-mails, and, recently, educational platforms.

The rapid growth of information resources is because of using technology and internet access for various educational purposes. As defined by Ardito (2006), E-learning platforms are more or less complex environments with integrated tools and services for teaching, learning, communicating, and managing learning materials. An E-

learning platform used network-based technology, and it was developed to enhance the educational process. Rego (2005) and Peretto (2008) stated that the advanced platform can support the process of learning and enable teachers to present the students' needs and improve their teaching skills.

The advanced properties of e-learning platforms are many starting from the better management of online courses, content, and assessment. Abdel-Halim (2011) stated that our world became more complicated to understand than before therefore using a technological application such as a platform help students how get and process critical information than definite facts. Applying technology in education is a must nowadays. Google Classroom is an example of one of the professional learning platforms that have several benefits such as given the access by the instructor to join the classroom anytime and anywhere. Additionally, it is free with special properties that the instructor uploads the content, selects from different types of evaluation such as writing a short or long paragraph, MCQ questions, and gives feedback by sending individual comments.

Using an e-learning platform was the applicable solution to move from face-to-face learning to e-learning (Al-zahrani, 2015). Using Quick Response (QR henceforth) codes as an example of using technology to teach and learn English. By scanning the code, students were automatically linked to online information (Rivers, 2009). Using technology has changed the way of learning and teaching and played a significant role in eliminating any constraints of time and place. On the same trend platform as an application of education technology as the ever-growing and imposing need for integrating innovating technology in our EFL classroom.

Critical reading

Reading critically needs the examination of different points of view with an inquiring mind, assessing your ideas, and evaluating conclusions to be persuasive to others. Therefore, writing critically needs to present the conclusion in an obvious and well-reasoned way to convince readers. Cottrell (2005) and Allen (2004) stated that critical thinking, reading, and writing have a common sub-skill including:

Analysis meant breaking the ideas into parts by (clarifying, identifying, comparing, and categorizing) to understand the whole text. It explained how the key components relate to each other and how to identify the inferential relationship among questions, statements, reasons, descriptions, opinions, experiences, and beliefs.

Interpretation meant examining the links between parts and the whole text by (associating, inferring, and decoding) the implications and meanings of the patterns and expressing the variety of situations, events, conventions, or procedures.

Evaluation entailed forming judgments about the values and qualities of a text by (justifying, critiquing, deciding, and verifying) the texts. It meant assessing the strength and inferential relationships among different types of questions, statements, and representations.

Inference meant seeking to understand the implied meaning not stated ones. The critical readers/ writers identified the elements to draw a logical conclusion to get relevant information to form conjectures or hypotheses from principles, questions, opinions, evidence, judgments, and beliefs.

Explanation was about stating and justifying the results of your reasoning based on the conceptual, contextual, and methodological way to present a form of cogent argument.

Self-regulation is related to the conscious analysis and evaluation of the inferential judgments of texts or correcting the authors' views or results.

Critical reading was an actualization of the critical thinking process that constituted a mental process and was directed to solve problems, make decisions, persuade, analyze, and evaluate ideas systematically (Johnson, 2002). Reading critically involves reading and thinking beyond what the authors wrote from perspectives. In response to the first question, the participants found that an adaptive e-learning platform is beneficial in learning critical literacy.

Critical readers identify errors, weaknesses, and strengths of a text and collect, use, and evaluate evidence and assumptions that are set to assess the quality of any critical reading text. Critical readers make judgments on the authors' views or ideas conveyed in the text by believing, trusting, following, or rejecting what the author has written. Critical reading skills provoked readers to become more active in understanding the authors' meaning that lay behind the text by evaluating the objectives and perspectives of the writers (Huijie, 2010). Critical reading skills encouraged students to think reflectively, analytically, and critically in dealing with the reading texts. The critical reading text helped readers to assess the meaning between the lines and to understand the writers' purpose (Mclanghin & Devoodd, 2004a).

To read critically, readers are not passively accepting the information in the text. However, critical readers were actively examining the writers' backgrounds and use different perspectives in understanding the text information (Mclanghin & Devoodd, 2004b). Reading texts and readers are the two major factors that the importance of critical reading is based on. The information received from electronic media, magazines, or newspapers is not always accurate and cannot be

trusted. Therefore, readers need to select and assess the information before accepting it. Critical reading skills were done to apply some points to a text including connecting information, predicting its purpose, revealing different points, evaluating ideas, analyzing the argument, and finding the main idea of a text (Flenming, 2012). Critical reading involves active engagement to deeply analyze and evaluate the text by applying many skills. Barnet and Bedau (2011) stated that critical readers should have the ability to (1) identify claims, (2) analyze and evaluate the preciseness of the ideas that support the thesis statement, (3) summarize arguments from the texts, (4) find stated or implied assumptions, and (5) explain, analyze, and evaluate the purpose and consequences of facts and sources of information.

Critical readers' characteristics involve the ability to collect evidence and use it to challenge assumptions and evaluate them based on the criteria of reading texts. Critical reading is a critical thinking process that was constituted as a mental process directed to make a decision, solve problems, analyze, persuade, and evaluate ideas (Johnson, 2007). Critical reading encouraged readers to be more active in understanding the meaning that lay behind the text through objectives, evaluating assumptions, and the authors' motions (Huijie, 2010).

Digital Competence

Digital literacy includes knowledge literacy, web literacy, and internet literacy. Moreover, Allen (2016) stated that the development of technology and structure is necessary for digital literacy. Digital literacy as mentioned by Goodfellow (2011) included groups of activities, new information, and media communication. On the other hand, digital literacy has known as "a survival skill" in the technological era (Eshet-alkalai & Amichai-Hamburger, 2004: 421).

Miller (2015) mentioned that the engagement of digitization in teaching and learning required students to be digitally literate. Being digitally literate referred to the ability to access, manage, integrate, communicate, evaluate, and create with others effectively (British Columbia Government, n.d.a.p.1). Nowadays, where information and communication technologies are becoming an essential part of our life, and it is used in teaching and learning English at all educational levels. So, there is a need to promote digital literacy skills in our education environment.

Digital literacy was defined by Okeji, Tralagband Obi (2019) as a set of complicated and integrated cognitive and technical skills. Digital literacy enabled EFL learners to comprehend and review online information accurately to build their new knowledge. Digital literacy skills involved the ability to navigate, communicate, locate, evaluate, and synthesize any information and use them in multiple formats (DL Task Force, 2013:2; Alseghayer, 2020). Technology and the English Language are inseparably interrelated and interacted with each other (Son et al., 2011). Digital literacy and the English language are essential demands to empower learners with 21st-century literacies that enhance learners' abilities in academic and workforce environments (Son, Park, and Park, 2017). Technology is the way that information is delivered at a higher education level. Using digital resources has become the predominant way to deliver content to learners.

The search for information on the internet is a core practice to complete courses' tasks and projects. Son et al. Chamrismiadji (2011) stated that the computer-assisted language learning (CALL) courses in EFL required an adequate level of digital literacy to realize effective self-directed learning. English language learners should move beyond the use of traditional paper-based content to digital content (Gilbert,2017). Additionally, meeting the educational demands requires learners to expand their digital competency and enhance their

language learning. Gilbert (2017) mentioned that computer-based technologies could have the power to increase the quality of teaching and learning foreign languages such as EFL learners that have poor input environments by exposing them to authentic learning life as their real life. Most of the studies about technology focused on how online activities and social networks strengthen language without mentioning how to explore the technical and cognitive skills needed to actively engage in those practices (Sawatdeenaraunt, 2014).

Alsmariv (2021) mentioned in the study of "The relationship between language proficiency level and L2 Digital Literacy Self-efficacy: A Study of EFL University Students" that the study was conducted to scrutinize the relationship between EFL students' second language (L2) digital literacy skills and self-efficacy and their English proficiency level. This study was conducted on 93 Saudi students majoring in English at Prince Sattam Bin Abdulaziz University. The data was analyzed statistically using descriptive measures and ANOVA. The results of this study are divided into three postulations. First, learners were believed to be digitally literate and technologically savvy. Therefore, learners handled emerging technologies without instructions. Sanchez Caballe et al. (2020) stated that students have insufficient digital skills as they only know how to use technology for entertainment rather than learning. Second, learners transformed their first language skills and applied them while using digital literacy in educational settings (Sawatdeenaraunt, 2014). So, the bulk of the literature reported that digital literacy skills can only be improved through explicit instructions and training (Leu et al., 2014). Third, the low and limited level of teachers' online search experience and digital literacy skills constituted a significant barrier to the successful application of digital learning (Dashetestani and Hojatpanah, 2020).

Context of the study

To document the problem of the current study, the researcher administered three instruments on 80 EFL third-year majors at the Faculty of Education, Minia University at the beginning of the first term of the academic year of 2021/2022. The three instruments included: a critical reading test, prepared by the researcher (see Appendix 1), a digital competence test, prepared by the researcher (see Appendix 2), a digital literacy questionnaire, adapted by the researcher (see Appendix 3). The findings of the tests revealed the participants' had low scores in critical reading. Moreover, based on SPSS data analysis of the digital literacy questionnaire, the researcher found that the participants lack the essential digital literacy abilities, competencies, skills, and attitudes such as low level of using digital literacy, lack of having a personal homepage or portfolio, and using digital learning resources, lack of digital skills such as recording and editing digital sounds and videos and inability to create and update webpages, infrequent use of digital tools such as graphics, blogs, and language learning software, lack of digital competencies such as working with learning management systems and file sharing sites and blogs, reported challenges of using digital literacy related to lack of time, students' skills, knowledge and training, and having negative attitudes towards digital literacy such as being behind fellow students in using digital technologies and feeling threatened about digital technologies. Therefore, teaching digital literacy to EFL students was deemed necessary to find out their level and needs of digital literacy to facilitate their use of technology in learning and teaching English.

Hypotheses

1- There would be a statistically significant difference between mean scores obtained by the participants of the experimental group and those of the control group in the post-test of the critical reading test (the knowledge and skill components) in favor of the experimental group.

2- There would be a statistically significant difference between mean scores obtained by the participants of the experimental group and those of the control group in the post-test of the digital competence in favor of the experimental group.

Design

The study adopted the pre-post experimental-control group design. Experimental and control groups were exposed to the pre-post means of collecting data. The experimental group was trained in the adaptive e-learning platform during a Micro-teaching course for developing critical reading and digital competence, whereas the control group did not receive such training. Alternatively, they took the Micro-teaching course with another instructor and followed the conventional way followed in teaching the course. Mainly, the participants of the control group were taught through the lecture and discussion formats as well as the micro-teaching practice followed by the teacher and student commentary.

Participants

The participants of the present study consisted of eighty male and female third-year English majors at the Faculty of Education, Minia University. The sample consisted of two groups that were randomly assigned to an experimental group and a control one. To achieve homogeneity and equality of the two groups, they had an equal level of critical reading and digital competence as ensured by pre-testing of the two groups in the two tests. Besides, the participants' grade level was controlled. All the participants were third-year English majors at the Faculty of Education, Minia University after excluding grade repeaters from the sample. The gender was also controlled as the two groups were heterogeneous including male and female participants in both groups.

Instruments

Two instruments were used in the current research: the critical reading test and the digital competence one.

The Critical Reading Test

The critical reading test was prepared by the researcher. It aims at assessing the participants' knowledge and application of critical reading skills. It consists of two components: knowledge and skills. The critical reading knowledge components consist of seven knowledge areas (inference, interpretation, explanation, evaluation, analysis, self-regulation, and critical reading process). The skill component consists of six subskills (interpretation, analysis, inference, evaluation, explanation, and self-regulation skills). The test consists of 35 multiple-choice items, 20 items for the knowledge component and 15 items for the skill component. The items were constructed according to the knowledge areas and skills of critical reading highlighted above and the tables of specifications of the two sections. Each question is followed by four alternative choices and the participant would choose the best option that reflects the knowledge related to the application of critical reading subskills.

A score is the total number of correctly marked answers. A point is given for each correct choice. The agreed-upon correct choices were based on the researcher's review of related literature and understanding of the adaptive e-learning platform to deal with critical reading knowledge and application of the subskills in the EFL classroom. They were also based on the modifications of the members of the jury. The researcher marked the correct choices for the members of the jury to decide whether they are the best options according to the appropriateness of the correct answer and its relationship to the focus of the application of the adaptive e-learning platform in the EFL classroom.

The validity and reliability of the test were checked. The content validity of the test was verified by members of the jury. The test was submitted to a jury of TEFL experts to judge its validity according to the following criteria: linguistic stating of the items, whether the items measure how far the objectives have been achieved, suitability and fitness of the items to the participants and coverage of the number of the items for the skills measured in the test, and suitability of the model answers. The members of the jury confirmed the suitability and applicability of the test after making the suggested modifications. The final version of the test was given to the participants after making the modifications suggested by members of the jury. Among the suggested modifications was to simplify the reading comprehension passages for the section of the test. Another example of the modifications was changing some of the distractors to avoid ambiguity. The reliability of the test was determined using Alpha Cronbach's method. The reliability coefficient of the test was 0.834.

The Digital Literacy Competence Test

The digital literacy competence test was prepared by the researcher. It aims at assessing the participants' application of digital literacy skills. It consists of six areas (access, integration, management, evaluation, communication, and creation). The test consists of 14 multiple-choice items. The items were constructed according to the competence areas of digital literacy highlighted above and the table of specifications. Each question is followed by four alternative choices and the participant would choose the best option that reflects the knowledge related to the application of critical reading subskills.

A score is the total number of correctly marked answers. A point is given for each correct choice. The agreed-upon correct choices were based on the researcher's review of related literature and understanding of the adaptive e-learning platform to deal with digital

literacy competence in the EFL classroom. They were also based on the modifications of the members of the jury. The researcher marked the correct choices for the members of the jury to decide whether they are the best options according to the appropriateness of the correct answer and its relationship to the focus of the application of the adaptive e-learning platform in the EFL classroom.

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Results

Hypothesis 1

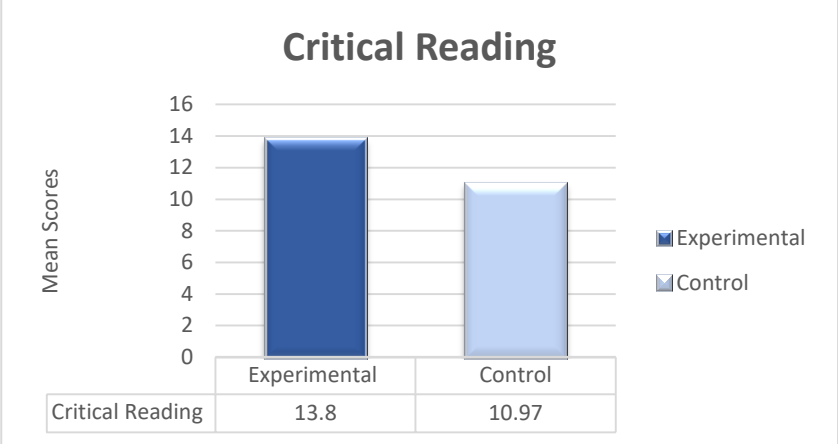
Data analysis of the results in this study using *t-test*, as shown in Table (1), reveals that there is support for *Hypothesis 1* as the results from the experimental group post-test (M = 13.80, SD = 1.95) and the control group post-test (M = 10.97, SD = 2.55) indicate that the use of adaptive learning platform resulted in an improvement in critical reading, t (78) = 5.556, p = .000. Therefore, *Hypothesis 1* is accepted as the results indicate a statistically significant difference in the means of scores obtained by the participants in the experimental group and those of the control group in the critical reading test in favor of the experimental group with a large effect size as calculated by Eta squared (d = 1.24).

Table (1): *t-test* results of the post-test of critical reading

Critical Reading Test	N	Mean	SD	t-value	DF	*p.* value
Experimental	40	13.80	1.95	5.466	78	.000**
Control	40	10.97	2.55			

* Significant at (0.05) ** Significant at (0.01)

Chart (1) illustrates the participants' improvement levels in the critical reading post-test in favor of the experimental group.



Data analysis of the critical reading components (i.e., critical reading knowledge, and critical reading application) also revealed that these two components mainly contributed to the overall statistically significant difference in favor of the experimental group. These components, as shown in Table (2), were found to be statistically significant as reported below:

(1) The results from the critical reading knowledge post-test of the experimental group (M = 8.65, SD = 1.68) and the control group (M = 7.07, SD = 2.15) indicate an improvement in favor of the experimental group, t (78) = 3.64, p = .000.

(2) The results from the critical reading application post-test of the experimental group (M = 5.15, SD = .92) and the control

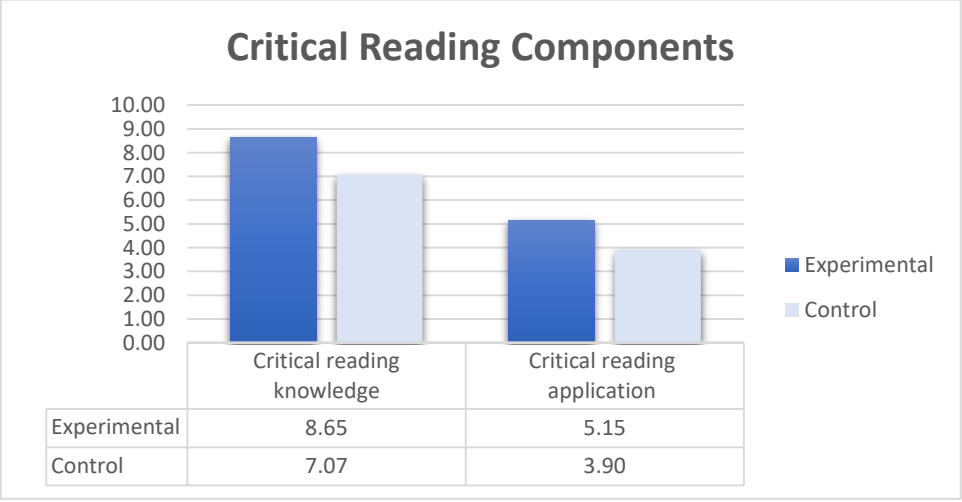
group (*M* = 3.90, *SD* = 1.69) indicate an improvement in favor of the experimental group, *t* (78) = 4.10, *p* = .000.

Table (2): *t-test* results of the post-test of critical reading components

Critical Reading	Group	N	Mean	SD	t-value	DF	*p.* value
Critical reading knowledge	Experimental	40	8.65	1.68	3.64	78	.000**
	Control	40	7.07	2.15			
Critical reading application	Experimental	40	5.15	.92	4.10	78	.000**
	Control	40	3.90	1.69			

* Significant at (0.05) ** Significant at (0.01)

Chart (2) illustrates the participants' improvement levels in the critical reading components (knowledge and application) post-test in favor of the experimental group.



Data analysis of critical reading knowledge areas (i.e., critical reading process, self-regulation, inference, interpretation, explanation,

evaluation, and analysis) also revealed that these seven areas mainly contributed to the overall statistically significant difference in favor of the experimental group. These areas are shown in Table (3):

(1) The results from the critical reading process post-test of the experimental group (M = 2.37, SD = .70) and the control group (M = 1.72, SD = .93) indicate a statistically significant improvement in favor of the experimental group, t (78) = 3.51, p = .001.

(2) The results from the self-regulation post-test of the experimental group (M = .90, SD = .54) and the control group (M = .57, SD = .50) indicate an improvement in favor of the experimental group, t (78) = 2.77, p = .007.

(3) The results from the inference post-test of the experimental group (M = 1.02, SD = .61) and the control group (M = 1.00, SD = .84) indicate an improvement in favor of the experimental group, t (78) = .15, p = .88.

(4) The results from the interpretation post-test of the experimental group (M = .80, SD = .46) and the control group (M = .62, SD = .58) indicate an improvement in favor of the experimental group, t (78) = 1.48, p = .14.

(5) The results from the explanation post-test of the experimental group (M = .80, SD = .64) and the control group (M = .65, SD = .57) indicate an improvement in favor of the experimental group, t (78) = 1.09, p = .27.

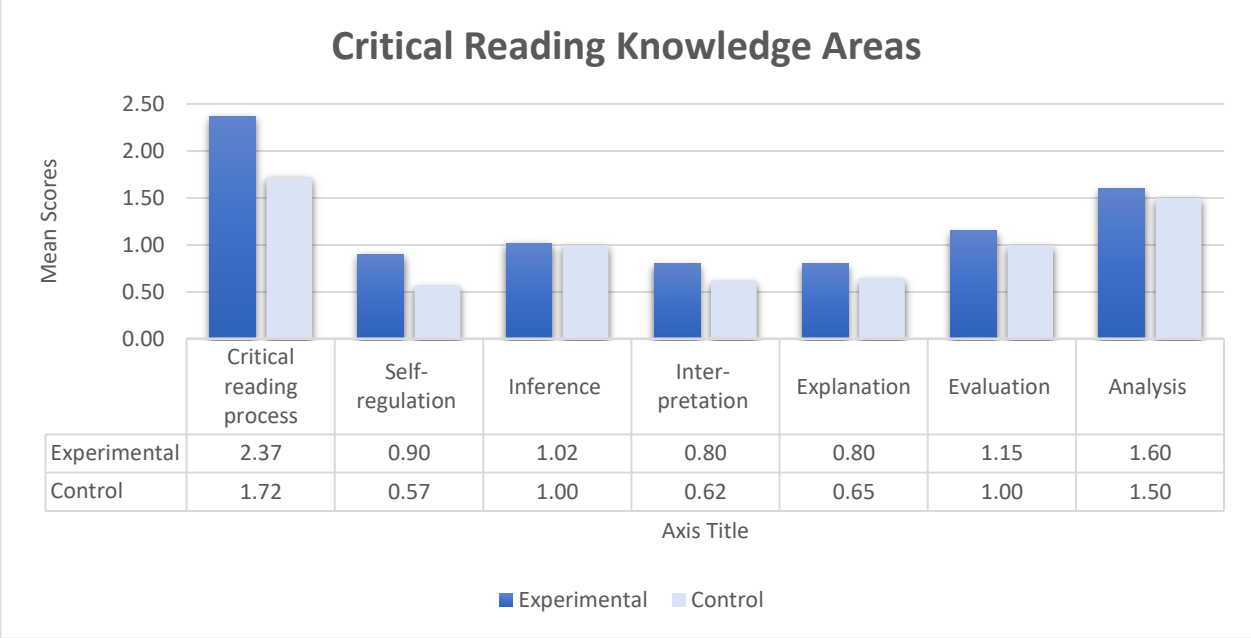
(6) The results from the evaluation post-test of the experimental group (M = 1.15, SD = .57) and the control group (M = 1.00, SD = .87) indicate an improvement in favor of the experimental group, t (78) = .90, p = .000.

(7) The results from the analysis post-test of the experimental group (M = 1.60, SD = .77) and the control group (M = 1.50, SD = .75) indicate an improvement in favor of the experimental group, t (78) = .58, p = .56.

Table (3): *t-test* results of the post-test of critical reading knowledge areas

Knowledge Area	Group	N	Mean	SD	t-value	DF	*p.* value
Critical reading Process	Experimental	40	2.37	.70	3.51	78	.001**
	Control	40	1.72	.93			
Self-regulation	Experimental	40	.90	.54	2.77	78	.007**
	Control	40	.57	.50			
Inference	Experimental	40	1.02	.61	.15	78	.88
	Control	40	1.00	.84			
Interpretation	Experimental	40	.80	.46	1.48	78	.14
	Control	40	.62	.58			
Explanation	Experimental	40	.80	.64	1.09	78	.27
	Control	40	.65	.57			
Evaluation	Experimental	40	1.15	.57	.90	78	.37
	Control	40	1.00	.87			
Analysis	Experimental	40	1.60	.77	.58	78	.56
	Control	40	1.50	.75			

Chart (3) illustrates the participants' improvement levels in critical reading knowledge areas (i.e., critical reading process, self-regulation, inference, interpretation, explanation, evaluation, and analysis):



Data analysis of the critical reading application in terms of six skills (i.e., self-regulation, inference, interpretation, explanation, evaluation, and analysis) also revealed that these six skills mainly contributed to the overall statistically significant difference in favor of the experimental group. These skills are shown in Table (6):

(1) The results from the self-regulation post-test of the experimental group (M = 1.05, SD = .45) and the control group (M = .52, SD = .55) indicate an improvement in favor of the experimental group, t (78) = 4.65, p = .000.

(2) The results from the inference post-test of the experimental group (M = .55, SD = .59) and the control group (M = .75, SD = .74) indicate no improvement in favor of the experimental group, t (78) = -1.32, p = .188.

(3) The results from the interpretation post-test of the experimental group (M = 1.40, SD = 1.00) and the control group (M = .77, SD = .69) indicate an improvement in favor of the experimental group, t (78) = 3.22, p = .002.

(4) The results from the explanation post-test of the experimental group (M = .20, SD = .40) and the control

group (*M* = .25, *SD* = .43) indicate no improvement in favor of the experimental group, *t* (78) = -.53, *p* = .598.

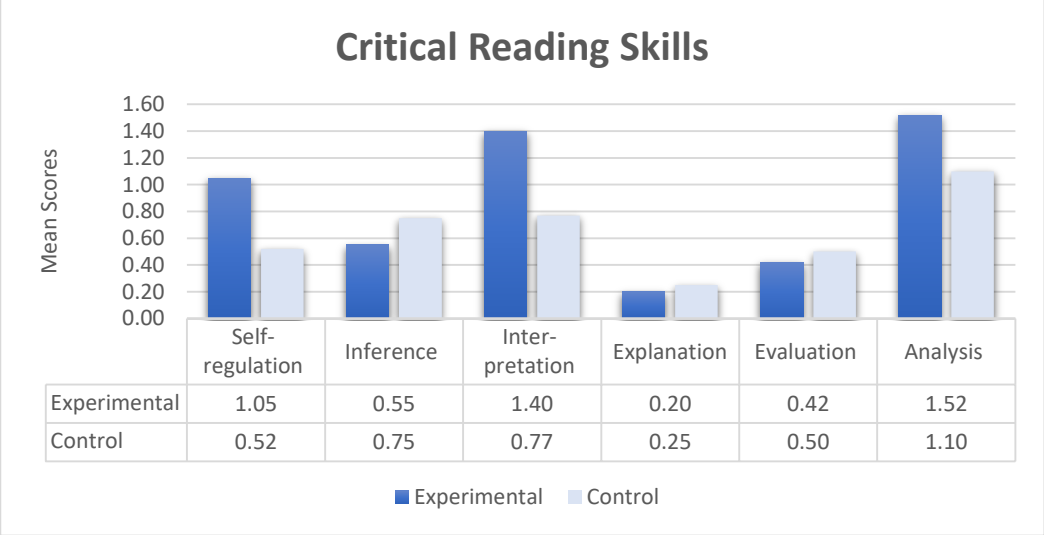
(5) The results from the evaluation post-test of the experimental group (*M* = .42, *SD* = .50) and the control group (*M* = .50, *SD* = .50) indicate an improvement in favor of the experimental group, *t* (78) = .34, *p* = .507.

(6) The results from the analysis post-test of the experimental group (*M* = 1.52, *SD* = .84) and the control group (*M* = 1.10, *SD* = .90) indicate an improvement in favor of the experimental group, *t* (78) = .81, *p* = .03.

Table (4): *t-test* results of the post-test of critical reading skills

Knowledge Area	Group	N	Mean	SD	t-value	DF	*p.* value
Self-regulation	Experimental	40	1.05	.45	4.65	78	.000**
	Control	40	.52	.55			
Inference	Experimental	40	.55	.59	-1.32	78	.188
	Control	40	.75	.74			
Interpretation	Experimental	40	1.40	1.00	3.22	78	.002**
	Control	40	.77	.69			
Explanation	Experimental	40	.20	.40	-.53	78	.598
	Control	40	.25	.43			
Evaluation	Experimental	40	.42	.50	.34	78	.507
	Control	40	.50	.50			
Analysis	Experimental	40	1.52	.84	.81	78	.03*
	Control	40	1.10	.90			

Chart (4) illustrates the participants' improvement levels in critical reading skills (i.e., self-regulation, inference, interpretation, explanation, evaluation, and analysis):



	Self-regulation	Inference	Inter-pretation	Explanation	Evaluation	Analysis
Experimental	1.05	0.55	1.40	0.20	0.42	1.52
Control	0.52	0.75	0.77	0.25	0.50	1.10

Hypothesis 2

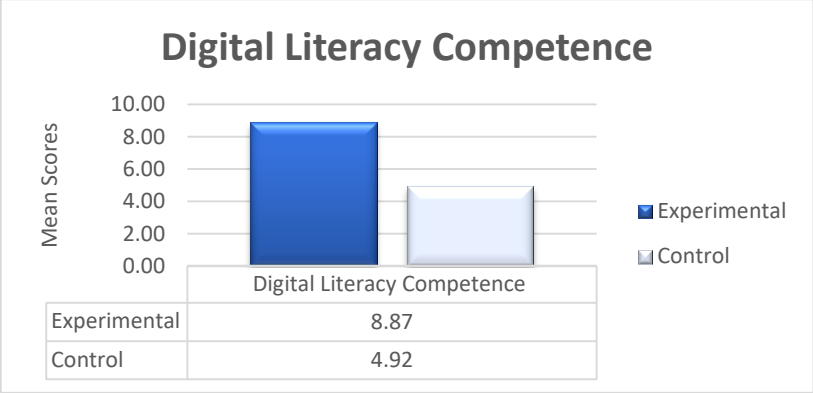
Data analysis of the results in this study using *t-test*, as shown in Table (5), reveals that there is support for *Hypothesis 2* as the results from the experimental group post-test (M = 8.87, SD = 2.39) and the control group post-test (M = 4.92, SD = 1.68) indicate that the use of adaptive learning platform resulted in an improvement in digital competence, t (78) = 8.52, p = .000. Therefore, *Hypothesis 2* is accepted as the results indicate a statistically significant difference in the means of scores obtained by the participants in the experimental group and those of the control group in the critical reading test in favor of the experimental group with a large effect size as calculated by Eta squared (d = 1.92).

Table (5): *t-test* results of the post-test of digital literacy competence

Digital literacy	Group	N	Mean	SD	t-value	DF	*p.* value
Digital literacy competence	Experimental	40	8.87	2.39	8.52	78	.000**
	Control	40	4.92	1.68			

* Significant at (0.05) ** Significant at (0.01)

Chart (5) illustrates the participants' improvement levels in the critical reading post-test in favor of the experimental group.



Data analysis of digital literacy competence in terms of six areas (i.e., access, integration, management, evaluation, communication, and creation) also revealed that these six skills mainly contributed to the overall statistically significant difference in favor of the experimental group. These skills are shown in Table (13).

(1) The results from the access post-test of the experimental group (M = 1.57, SD = .74) and the control group (M = .95, SD = .87) indicate an improvement in favor of the experimental group, t (78) = 3.43, p = .001.

(2) The results from the integration post-test of the experimental group (M = 1.20, SD = .56) and the control group (M = .35, SD = .53) indicate an improvement in favor of the experimental group, t (78) = 6.92, p = .000.

(3) The results from the management post-test of the experimental group (*M* = 1.25, *SD* = .58) and the control group (*M* = .67, *SD* = .69) indicate an improvement in favor of the experimental group, *t* (78) = 3.99, *p* = .000.

(4) The results from the evaluation post-test of the experimental group (*M* = 1.92, *SD* = .94) and the control group (*M* = 1.02, *SD* = .83) indicate an improvement in favor of the experimental group, *t* (78) = 4.52, *p* = .000.

(5) The results from the communication post-test of the experimental group (*M* = 1.67, *SD* = .61) and the control group (*M* = 1.57, *SD* = .59) indicate no improvement in favor of the experimental group, *t* (78) = .73, *p* = -.462.

(6) The results from the creation post-test of the experimental group (*M* = 1.25, *SD* = .70) and the control group (*M* = .35, *SD* =.48) indicate an improvement in favor of the experimental group, *t* (78) = 6.64, *p* = .000.

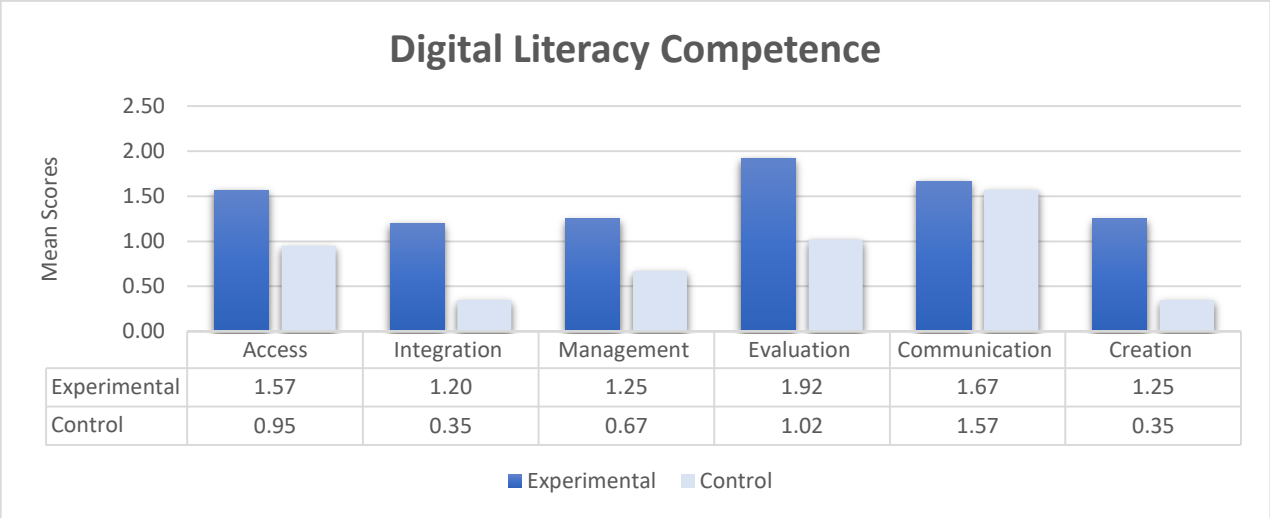
Table (6): *t-test* results of the post-test of digital literacy competence

Knowledge Area	Group	N	Mean	SD	t-value	DF	*p.* value
Access	Experimental	40	1.57	.74	3.43	78	.001**
	Control	40	.59	.87			
Integration	Experimental	40	1.20	.56	6.92	78	.000**
	Control	40	.35	.53			
Management	Experimental	40	1.25	.58	3.99	78	.000**
	Control	40	.67	.69			
Evaluation	Experimental	40	1.92	.94	4.52	78	.000**
	Control	40	1.02	.83			

Communication	Experimental	40	1.67	.61	.73	78	.462
	Control	40	1.57	.59			
Creation	Experimental	40	1.25	.70	6.64	78	.000**
	Control	40	.35	.48			

* Significant at (0.05) ** Significant at (0.01)

Chart (6) illustrates the participants' improvement levels in digital literacy skills (i.e., access, integration, management, evaluation, communication, and creation).



Discussion

The research was conducted to investigate the use of an adaptive e-learning platform to develop Minia University Faculty of Education third-year English majors' critical reading and digital competence. The participants in the experimental group were taught adaptive e-learning training through a Micro-teaching course. The program was based on a set of adaptive e-learning systems that has four basic techniques (i.e., adaptation of content, navigation, presentation, and feedback) that were used to develop the participants' critical reading. It was divided into two main parts: skills and knowledge. Part 1 (critical reading

skills in terms of using interpretation, analysis, inference, evaluation, explanation, and self-regulation), part 2 (critical reading knowledge in terms of using critical reading process, self-regulation, inference, interpretation, explanation, evaluation, and analysis). Digital competence was divided into two main sections: section (1) digital competence (in terms of using access, management, integration, communication, evaluation, and creation), and Section (2) digital literacy knowledge (in terms of digital literacy concept, applying technology, digital literacy process, and platform).

The results of the present study have confirmed that critical and digital literacies can be developed through systematic instruction using an adaptive e-learning system. The participants in the experimental group performed far better than their counterparts in the control group. Statistical differences in the four hypotheses favored the experimental group. This reveals that the adaptive e-learning system employed while giving the program was effective in developing the participants' critical reading and digital competence.

Reviewing the literature tackling the problem of critical reading skills for Egyptian students revealed that many students in different educational stages suffer from weaknesses in critical reading skills in the preparatory stage (Badawy, 2018; El-Mistikawy, 2016), secondary stage (Abu Zeid, 2017; Bahagat, 2015; El-Maleh, 2006), as well as at the college level (Ahmed, 2012; Barakat, 2018; Ellozy & Mostafa, 2010; El-Sakka, 2011; Gharib, 2012; Makhyoun, 2008). Accordingly, adaptive e-learning has five main features including content, presentation, navigation, assessment, and feedback that help to enhance critical reading knowledge and skills.

Adaptive content improves the critical reading through the uploaded content given to the participants through the platform. As mentioned by Abdelhalim (2011) that our world is getting complicated to

understand, therefore adapting content enables students how to process critical content than definite facts. Critical readers have to cope with the availability of information and knowledge via the web which requires a critical reader, not a naïve one (Alqatanani, 2017). The adapted content can be presented in different formats such as audio, video, graphics, and text to accelerate learners' performance in achieving their learning goals, reduce the waste of time in learning, improve learning knowledge, and facilitate instructions.

The advanced properties of e-learning platforms are many starting from the better management of online courses, content, and assessment. Abdel Halim (2011) stated that our world became more complicated to understand than before therefore, using technological applications such as platforms helps students how to get and process critical information than definite facts. "Digital literacy was the awareness, attitude, and ability of individuals to appropriately use digital tools and facilities to identify access, manage, integrate, evaluate, analyze and synthesize digital resources construct new knowledge, create media expression and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process" Martin (2006. p.155).

Recommendations

Based on the results of the study, some recommendations are made and can be made used to develop English language education. These recommendations include:

1- Introducing the concept of the adaptive e-learning platform in a course to be taught to students at the Faculty of Education to develop their understanding of the adaptive e-learning platform and its applications in developing teaching skills.
2- Relying on the adaptive e-learning platform approaches in training student teachers through the course of Curricula,

Methods of Teaching EFL, Micro-teaching, and Teaching Practice.

3- Following student teachers during the teaching practice period to make sure that they made use of the adaptive e-learning platform and their applications in teaching and providing feedback as appropriate to enhance their teaching practice in general and critical and digital literacies in particular.

Suggestions for further research

Considering the results of the study, suggestions for further research include:

1- Replicating the study with a sample of in-service teachers.
2- Conducting a research study on the effect of using the adaptive learning system on developing student teachers' teaching skills.
3- Conducting a research study on the effect of using the adaptive e-learning platform on EFL in-service teachers' professional development.
4- Conducting a research study to identify the effect of using an adaptive e-learning system to develop EFL majors' critical and digital thinking skills.

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