The Effects of Online Flipped Reading Instruction Utilizing Scaffolding and Digital Badges on EFL Deep Comprehension and Reading Engagement

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Abstract

Due to the COVID-19 situation, fully online flipped learning that combines online asynchronous learning activities followed by online synchronous discussions and tasks emerged as a working instructional model that provides a conducive learning environment. This study examined the extent to which online flipped reading instruction utilizing scaffolding and digital badges improved deep reading skills and reading engagement of EFL university students at Port Said Faculty of Education. Students were provided with online flipped reading instruction delivered via Edmodo and Google Classroom for reading expository texts. Sixty-eight English-majored freshmen at Port Said Faculty of Education participated in this study. A mixed-methods research design was employed with multiple sources of data, including the pre- and post-tests of deep reading comprehension, the reading engagement questionnaire, and the focus group interviews. Findings showed that incorporating scaffolding and digital badges in online flipped reading instruction can be implemented effectively within the context of university education. Besides, the results indicated that the treatment not only improved the participants' deep reading comprehension but also significantly fostered positive collaboration and active engagement. The study is concluded by suggesting future research that targets constructing a meaningful understanding of online learning environment, deep reading comprehension, and reading engagement with implications for pedagogical practice, particularly with EFL learners.

Keywords: *online flipped classroom, scaffolding, digital badges, deep reading comprehension, reading engagement.*

أثر التدريس المقلوب عبر الإنترنت للقراءة باستخدام السقالات التعليمية والشارات الرقمية على القراءة العميقة والإندماج في القراءة باللغة الإنجليزية كلغة أجنبية

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المستخلص:

نظرًا لظروف فيروس كورونا Covid-19، ظهر التعلم المقلوب عبر الإنترنت الذي يجمع بين أنشطة التعلم غير المتزامنة عبر الإنترنت ويتبعها المناقشات والمهام المتزامنة عبر الإنترنت كنموذج تعليمي يوفر بيئة محفزة للتعلم. هذا البحث يتناول أثر التدريس المقلوب للقراءة باستخدام السقالات التعليمية والشارات الرقمية على القراءة العميقة والإندماج في القراءة باللغة الإنجليزية كلغة أجنبية. تم إجراء هذا البحث على ثمانية وستين طالب بالفرقة الأولى بشعبة اللغة الإنجليزية في كلية التربية جامعة بورسعيد. استخدمت الباحثة تطبيقات إدمودو وجوجل كلاس رووم في تقديم التعلم المقلوب المعزز بالسقالات التعليمية والشارات الرقمية. تم استخدام منهج البحوث المختلطة والتي تجمع بين الأساليب الكمية والكيفية في جمع ومعالجة البيانات والتي اعتمدت على اختبار الفهم القرائي العميق، استبيان الاندماج في القراءة، مقابلات مجموعة التركيز. أظهرت النتائج فعالية دمج السقالات التعليمية والشارات الرقمية في التدريس المقلوب للقراءة في تنمية الفهم القرائي العميق وتعزيز الإندماج القرائي لدى الطلاب المشاركين بالدراسة. انتهت الدراسة إلى بعض التوصيات ومنها ضرورة تضمين أدوات تكنولوجية متنوعة في التعليم الإلكتروني، وتعزيز تعلم اللغة الإنجليزية باستخدام أنواع مختلفة من السقالات التعليمية، استخدام الشارات الرقمية لتنمية الإندماج في التعلم وخاصة في بيئات التعلم عبر الإنترنت.

الكلمات المفتاحية: التعلم المقلوب، السقالات التعليمية، الشارات الرقمية، الفهم العميق للقراءة، والإندماج في القراءة.

The Effects of Online Flipped Reading Instruction Utilizing Scaffolding and Digital Badges on EFL Deep Comprehension and Reading Engagement

Introduction:

Reading is a fundamental skill for accessing new information and learning new skills as comprehending expository texts is critical for success academically and in life. Therefore, improving reading skills of EFL learners would lead to enhancing other language skills and academic skills, particularly at the university level as students are required to read various kinds of advanced texts. Cartwright et al. (2020) affirm that higher education students exhibit difficulties in different elements of skilled reading, such as reading fluency, knowledge and use of comprehension strategies, word recognition, and reading comprehension. However, Xu et al. (2021) state that while reading comprehension is challenging for native English speakers, it is more challenging for ESL/EFL learners.

Comprehending university texts is more complicated than other types of reading as it requires careful synthesizing of long texts with challenging vocabulary and concepts. Zakarya et al. (2020) mention that though comprehending academic text is a core skill for EFL university students, many students who enter higher education institutions are found to be unprepared. Students struggle for many reasons such as poor English language proficiency, low awareness of reading strategies, inaccurate perceptions of reading, and demotivation to read.

Investigating the problems of reading comprehension of EFL learners, Riadil (2020) found that Indonesian students at Tidar University struggle with pronouncing words correctly, mastering vocabulary, connecting ideas within the text, understanding different cultural backgrounds, connecting ideas with their knowledge, differentiating between the main point and supporting details, and inferring information. Abeeleh et al. (2021) found that EFL students at Ajloun National University depend heavily on word-to-word translation when reading English and concentrate on comprehension at the word and sentence levels rather than the text level and they lack reading strategies. Xu et al. (2021) emphasized that conventional English reading instruction that uses the Grammar-Translation Method and neglects the higher-order reading strategies results in English

language learners (ELLs) who can recognize English words and sentences but struggle with identifying the main ideas, text genres, and connections within and between paragraphs.

In the Arab context, Raihan and Nezami (2012) found that Saudi EFL learners have a low-level performance of university-level reading comprehension. Likely, Qrqez and Ab Rashid (2017) found that EFL university students face several reading problems including accuracy, comprehension, and speed. Similarly, Dweikat (2019) found that insufficient vocabulary is the biggest problem EFL students at Al-Quds Open University face. Al-Jarrah and Ismail (2018) found that the major difficulty faced by Arab EFL university students is the inability to recognize the types of text. Similar results were found in Ahmed's (2021) qualitative study revealing that Yemeni EFL students face reading difficulties such as inferring meanings of unfamiliar words, getting the gist of the text, inferring implied ideas, and managing the reading tasks. These difficulties were attributed to a lack of vocabulary, lack of effective reading strategies, the unfamiliar structure of the text, limited experience, reading practice, and reading demotivation.

In the Egyptian context, Diab et al. (2020) found that English language juniors, at the Faculty of Education, Benha University encountered difficulties in EFL listening and reading skills including poor comprehension of the main idea of the reading text, inability to infer information or even differentiate between facts and opinions, lacking the desire to read, reading slowly, focusing on a word by word reading. Similarly, Welson et al. (2020) reported that English language freshmen at the Faculty of Education encounter diverse reading comprehension problems including identifying the topic, the main idea, specific stated information, and unfamiliar words as well as problems with making predictions and summarizing texts.

Reading is a complex process that requires interaction between the reader and the text, instead of a word decoding process, to understand the writer's point of view (Qrqez & Ab Rashid 2017). Reading comprehension has two levels; lower-order which requires literal comprehension and higher-order which requires making inferences, summarization, and evaluation (Xu et al., 2021). Developing lower-order comprehension skills is not enough to reach deep comprehension. Effective reading instruction should expose EFL learners to complex texts and open-ended reading tasks that support sophisticated reasoning.

Deep comprehension involves high-level thinking skills, not just understanding a text, but also interpreting meaning by merging information from the text with the schemata one already has, synthesizing reading texts, and even using and evaluating information. Deep understanding entails high-level thinking skills that encompass thinking critically and reflectively in evaluating evidence from an argumentative statement and even further thinking creatively to produce new ideas and then integrate new information into new contexts. Furthermore, deep comprehension involves procedural thinking which comprises analysis, synthesis, making links, and developing maps (Damaianti et al., 2020)

Keeping students motivated to fully comprehend and deeply process information from what they read is highly influenced by motivation and engagement. According to Guthrie and Wigfield's (2000) model of reading engagement development, reading engagement is the joint functioning of motivational processes and cognitive strategies that are required for reading comprehension growth as engaged readers can overcome obstacles and combat challenges they face during reading. This engagement model suggests the following claims: (a) reading engagement is defined as strategically and motivationally interacting with text, (b) engaged reading correlates with achievement in reading comprehension, (c) instructional practices that focus on developing motivation and cognitive strategies can foster engaged reading, and (d) an instructional framework that combines motivational and cognitive strategy support increases engaged reading and reading comprehension.

Reading engagement yields reading achievement and it is influenced by classroom practices (Wigfield et al., 2008). Reviewing reading engagement literature, Wu et al. (2020) concluded that less engaged EFL learners are less likely to succeed in language learning. Investigating the aspects of reading engagement of ESL learners, Protacio (2017) found that students with high reading engagement levels are more motivated to read, use reading strategies, and construct meaning from texts by themselves and through social interactions.

Engagement-supporting practices for reading provide instruction in the cognitive strategies and support the motivational processes of reading. El-Henawy (2007) suggests that effective reading instruction should involve students on several levels of interactions including (a) interacting with texts using skills of comprehension and critical thinking, (b) reflecting personally on the text, (c) sharing ideas with classmates, and (d) interacting with the teacher through

discussion and class activities using tools of interpretation, analysis, and evaluation. In the same vein, Susanti et al. (2020) assure that adopting collaborative learning improves higher-order comprehension skills by activating learners' background knowledge, making predictions, monitoring their comprehension difficulties, clarifying information, restating important ideas, summarizing the text, and forming appropriate questions about the text.

Foreign language education should shift from a form of "spoon-feeding" into a more active, interactive, and engaging paradigm. Ahmed (2021) points out that EFL teachers should adopt a learner-centered approach in which students are encouraged to view reading as a future life skill and trained on using reading strategies effectively. The flipped classroom is an innovative instructional approach that reverses the conventional pedagogy by delivering the learning materials before the class and then using class time for interactive exercises, discussions, and various engaging activities.

Due to the global outbreak of COVID-19, a large number of universities have suspended on-campus activities and transitioned to online instructional models. Ahmed (2021) affirms that flipped instruction switches the conventional approach to classroom teaching. Before each lesson, students learn the course materials by reading, watching videos, and completing short tasks. Teachers spend lesson time on more interactive and advanced thinking activities that allow students to discuss and apply newly learned knowledge. Phung and Yen (2020) assure that the flipped model is beneficial for students by: (a) enhancing learners' participation as they are engaged actively in collaborative learning activities; and (b) optimizing the educational environment as being previously exposed to knowledge at home. Accordingly, students can maximize their practice and gain a deeper understanding of the knowledge through in-class activities. In the same vein, Wu et al. (2020) confirm that several previous studies have reported the benefits of flipped instruction in improving student engagement, class participation, higher-order thinking skills, and meaningful learning.

Though interaction with peers and instructors, is one of the core factors determining students' successful learning experiences in an online learning environment, some empirical studies have reported the lack of students' active involvement in virtual learning settings (Cho & Kim, 2013). This lack of interaction may be due to the inability of online teachers to implement scaffolding tactics that encourage engagement and facilitate learning. Cho, M. and Cho, Y

(2016) assure that educators should implement scaffolding techniques (e.g. setting clear rules for online interaction, managing students' behaviors, asking insightful questions, and providing prompt feedback) to facilitate online social interaction and optimize online learning experience.

Kannan, et al. (2020) state that flipped learning, one of the blended learning models has been limited by low engagement, poor self-regulation and time management skills, and procrastination of students in the online component. Accordingly, to keep learners motivated and engaged, digital badges as innovative digital tools have been incorporated into this study to strengthen and create a more active online flipped learning experience. Farmer and West (2018) defined digital badges as concise digital images accompanied by extensive metadata that offer a clearer depiction of the actual knowledge acquired. This metadata encompasses details about the badge issuer (institution name, date of issuance, rubric, and criteria for earning the badge) as well as information about the badge earner (name, evidence of learning, and feedback from the issuer).

A review of research on the variables of the present study including deep reading comprehension, reading engagement, online flipped instruction, e-scaffolding, and digital badges suggests the following conclusions:

- EFL teachers should try to develop students' not only lower-order but also higher-order reading skills which are a part of the 21st-century skills and competencies.
- Online flipped instruction has emerged as a convenient medium of learning during the pandemic outbreak as COVID-19 has forced teachers to shift instruction from face-to-face to online learning with its two forms synchronous and asynchronous learning.
- The flipped model in EFL teaching is "under-evaluated, under-theorized and under-researched in general" (Phung, & Yen, 2020).
- Few studies have examined the effect of flipped instruction on English reading skills and motivational factors (Wu et al., 2020), particularly at the university level and in the EFL context.
- Most of the research in the area of scaffolding has been carried out within the context of face-to-face interactions (Cho, M. & Cho, Y., 2016).
- Reading engagement studies have concentrated mainly on native-English-speaking students (Protacio, 2017).

Context of the problem

Though mastering reading plays a crucial role in university academic achievement, students encounter many difficulties practicing reading particularly when EFL is the medium for studying most subjects. The situation of Arab students at faculties of education majoring in English section is not an exception. Students studying at the Faculty of Education, Port Said University to earn the Bachelor of Arts and Education (English Major) study academic courses specialized in English Literature and Linguistics with 108 credits in addition to educational and cultural courses with 40 credits. Six courses of educational courses are related to TEFL, accordingly, the students study in English 114 credits of 148 credits representing 77% in addition to the practicum.

The current researcher has extensive experience as an academic advisor for students majoring in the English section. Upon reviewing the academic records of these students, it becomes evident that the first year poses significant challenges for them, resulting in various obstacles. One such obstacle is the lack of effective strategies for comprehending lengthy academic texts intended for individuals with a high level of English proficiency. It has been observed that first-year students encounter difficulties with English-based academic courses, despite meeting the enrollment requirements for the English section. Surprisingly, approximately one-third of these students fail to pass between one to five English academic courses solely in their first year, with some even surpassing this number and achieving low Grade Point Averages (GPA). Consequently, these students are placed under academic observation and are mandated to reduce their course load while improving their GPA. Failure to do so may lead to the cancellation of their registration.

Furthermore, during teaching the courses “Teaching English Curriculum 1” and “Reading 1” to first-year students at the English section, the Faculty of Education, Port Said University, the researcher noticed students’ low reading performance that focuses on surface levels and their unwillingness to read the assigned texts or participate in discussing it.

Accordingly, the problem of the present study is that first-year students at Port Said Faculty of Education lack deep reading comprehension skills and they are less motivated to participate actively in a web-based learning environment. Thus, the present study aimed to improve these students’ deep reading

comprehension skills and reading engagement by incorporating e-scaffolding and digital badges. The problem of the study will be investigated through answering the following main question:

What are the effects of online flipped reading instruction utilizing scaffolding and digital badges on deep reading and reading engagement of EFL students at Port Said Faculty of Education?

The main question is sub-divided into the following questions;

1. How effective is online flipped reading instruction utilizing scaffolding and digital badges in improving deep reading of EFL students at Port Said Faculty of Education?
2. How effective is online flipped reading instruction utilizing scaffolding and digital badges in fostering reading engagement of EFL students at Port Said Faculty of Education?

Significance of the study

1. Shifting educators' attention toward the need for enhancing students' deep reading.
2. Presenting digital badges as an innovative tool that can be utilized to optimize web-based English instruction.
3. Drawing educators' attention to the importance of scaffolding in facilitating web-based English language learning.
4. Offering valuable guidelines upon which future flipped instruction treatments that can foster English language learning and enhance learners' engagement.

Review of Literature

Deep Reading Comprehension

Reading for deep comprehension that goes beyond the literal sense is a crucial skill for successful learners in the 21st century. LaRusso et al. (2016) state that success at the reading tasks encountered in higher education settings requires deep comprehension which entails integrating newly acquired with prior knowledge, analyzing texts, making inferences and comparisons, using textual evidence to formulate a position, and synthesizing across multiple texts. However, Minguela et al. (2015) note that a large number of students who are

skillful at completing low-complexity tasks struggle when they are faced with complex tasks that require making inferences from the text, integrating information across the text, evaluating the content, or constructing knowledge.

Deep reading comprehension is defined by Wolf and Barzillai as a set of sophisticated processes that stimulate comprehension and that include inferential and analogical skills as well as deductive, critical, and reflective thinking (2009; cited in Mackey, 2020). Allen and McNamara (2020) mention that the notion of deep comprehension originates from the *theory of processing levels* proposed by Craik and Lockhart in 1972, which assumes that readers process the meaning of a text in three progressively deeper levels including structural, phonemic, and semantic encoding, and *the construction-integration model of comprehension* designed by Kintsch in 1998, which assumes that readers construct three levels of comprehension including surface structure, textbase, and situational model.

There are diverse levels of comprehension sometimes referred to as literal versus inferential comprehension, or shallow versus deep comprehension. Graesser et al. (2002, 6) distinguish between behaviors that involve only listing facts and steps as well as simply defining concepts which they described as *shallow comprehension*, and behaviors that entail generating inferences, solving problems, making decisions, integrating ideas, applying knowledge, and analyzing and synthesizing ideas, which they designated as *deep comprehension*. Likely, Dorn and Soffos (2005, 14) differentiate between the *surface level* of comprehension, which involves recalling factual information from the text and is known as the literal level of understanding, and the *deep level* of comprehension which involves analyzing and synthesizing different sources of information, integrating the author's intentions with the reader's point of view, and reflecting on the text using the reader's background experience.

Scholars (e.g. LaRusso et al., 2016; Rouijel et al., 2019) affirm that reading comprehension goes beyond lower-level skills such as retention or literal comprehension to entail applying a variety of higher-level thinking skills such as analyzing, evaluating, and creating in order to interact with the text actively. Reviewing the literature, Guevara et al. (2020) concluded that reading comprehension implies three levels; (a) literal comprehension that focuses on events, periods, scenarios, details, or ideas explicitly stated in the texts; (b) inferential comprehension that targets the construction of meanings and going beyond literal meanings by activating reader's prior knowledge and formulating

predictions, hypotheses, and interpretations from the context; and (c) critical comprehension that focuses on making judgments by contrasting the ideas and values outlined in the texts with the knowledge, beliefs, and experiences of the reader.

Deep comprehension requires making inferences, constructing connections among information from multiple sources (text-to-self, text-to-text, and text-to-world), examining the validity of claims, and understanding the motives of authors (Allen, & McNamara, 2020; Jufri, 2019). Deep comprehension entails the reader's ability to act on, react to, or transform the presented information within a text in ways that reflect such understanding (Brassell, & Rasinski, 2008). Dorn and Soffos (2005, 15) explain that deep comprehension depends on the dynamic interplay between four types of knowledge: (a) *generic knowledge* which refers to the reader's background information; (b) *text knowledge* which relates to the precise message of the text, including content knowledge, vocabulary meanings, and text structure; (c) *strategic knowledge* which refers the reader's knowledge of specific strategies for processing texts and managing the reading processes; and (d) *reflective knowledge* which relates to thinking beyond the text and processing information at deeper levels by analyzing, synthesizing, and evaluating information.

For processing texts deeply to happen, reading needs to be active. Therefore, teachers should create stimulating learning opportunities for students to participate enthusiastically and effectively in the learning process by setting up a learning environment that boosts inquiry learning, triggers deep, reflective processing, and requires students to tackle meaningful questions and build knowledge. Graesser et al. (2011) and Minguela et al. (2015) agree that teachers should pose deep reasoning questions that require lengthier answers, train students how to ask questions, and how to use strategies for finding answers, evaluating answers, monitoring progress, and revising questions. Additionally, McNamara (2011) highlights that deep comprehension could be enhanced by strategic, reflective activities such as asking insightful and probing questions, seeking answers to questions, evaluating the quality of answers, making elucidations and interpretations, questioning assumptions, solving problems, and reflecting on the process and product of learning activities.

Researchers stressed the effects of positive classroom contexts on fostering deep reading comprehension and its connection with reading engagement. Dorn

and Soffos (2005, 17) specified four basic conditions for fostering deeper comprehension as follows: (a) constructing and activating adequate prior knowledge; (b) using meaningful and motivating learning materials to sustain attention over time; (c) providing enough time to process the information through rereading, clarifying, analyzing, and internalizing the content; (d) engaging readers in discussions to connect different knowledge sources. In addition, Graesser et al. (2005) emphasize that learners need scaffolding for deep inquiry and metacognitive strategies. Likely, Hammond and Gibbons (2005) as well as Sharma and Hannafin (2007) stress the significance of scaffolding in deepening students' understanding by providing opportunities for extending, externalizing, and comparing their knowledge with those of peers and experts. Applegate and Applegate (2013) confirm that highly engaged readers read with deeper comprehension than their less-engaged counterparts. Similarly, Barber and Klauda (2020) assure that "Active reading engagement helps individuals build the varied cognitive processes requisite to deep reading comprehension" (p. 28). Guthrie and Klauda (2014) found that the Concept-Oriented Reading Instruction (CORI) framework including instructional support for choice and collaboration, accompanied by cognitive scaffolding strengthened middle school students' informational text comprehension, motivation, and engagement.

Reading Engagement

Student engagement is gaining interest increasingly as the key to academic success and researchers provided a variety of conceptualizations with different numbers of subcomponents or dimensions (i.e., 2-6). Fredricks and McColskey (2012) affirm that engagement models with three or fewer components are more accurate theoretically and empirically because there is little to no overlap of items between components. Focusing on behavioral and emotional engagement, Furrer and Skinner (2003) conceptualized engagement as "the active, dynamic, goal-oriented, constructive, sustained, and focused interactions with the social and physical learning contexts" (p. 149). Fredricks et al. (2004) presented student engagement as a multidimensional construct including behavioral, emotional, and cognitive components. In this perspective, Shernoff (2013) defined engagement as "a complex construct, encompassing both observable and unobservable psychological events, persistent interaction, and positive emotions" (p. 47). Reviewing the literature on student engagement, Hiver et al. (2021) conclude that engagement can be defined as "the quantity and quality of learners' active participation and involvement in a language learning activity" (p. 2).

There is a widespread consensus in the engagement literature on the operationalization of the triple model of engagement that encompasses emotional, cognitive, and behavioral dimensions (Abdelhalim, 2017; Fredricks, & McColskey, 2012; Shernoff, 2013). *Emotional engagement* refers to positive affective reactions toward instructors, colleagues, and context and it includes feelings of involvement, belonging, interest, valuing of activities, and appreciation of success (Barber et al., 2016; Lutz et al., 2006). *Cognitive engagement* refers to exerting mental effort with thoughtful and purposeful usage of learning strategies, self-regulation, and deep thinking to accomplish difficult tasks and it includes persisting with challenging activities, reading more materials, asking questions for clarification of ideas, reviewing previously learned material, and expending energy to comprehend complex concepts (Finn, & Zimmer, 2012; Fredricks, & McColskey, 2012; Lutz et al., 2006). *Behavioral engagement* refers to participation and involvement in academic activities and it includes attentiveness, effort and persistence, completion of assignments, interactions with instructors and colleagues, following classroom rules, and initiative-taking behaviors (Finn, & Zimmer, 2012; Fredricks et al., 2004).

Focusing on students' reading engagement, Guthrie et al. (2012) define engagement as "a multidimensional construct that includes affective, cognitive, and behavioral attributes related to being deeply involved in reading activities" (p. 602). Guthrie and Wigfield (2000) differentiate reading engagement from reading motivation; whereas the former refers to "interacting with texts strategically and with motivation" (p. 404), the latter refers to "the individual's personal goals, values, and beliefs with regard to reading topics, processes, and outcomes" (p. 405). "Engagement in reading is the joint functioning of motivations and strategies as students construct conceptual knowledge during reading" (Guthrie et al., 1999, p. 344). Engaged readers actively read, set reading goals, ask questions, seek out additional information, find answers, learn from others, share their knowledge with others, and employ learning strategies (Swan, 2003). In reading, *behavioral engagement* is manifested in interactional initiatives by exchanging interpretations of texts with peers and teachers as well as effort, persistence, and time spent in reading, *emotional engagement* relates to learners' personal affective reactions during participating in reading activities or tasks, and *cognitive engagement* is reflected in interacting with others, questioning, volunteering answers, exchanging ideas, and offering feedback (Hiver et al., 2021).

In this perspective, Guthrie and Wigfield (2000) developed a conceptual framework for engagement processes in reading that links instructional practices to students' motivations, strategy use, conceptual knowledge, and social interactions, and reading outcomes. This framework, as Guthrie et al. (2012) mention, proposes that classroom teacher's practices including (a) autonomy support, (b) selecting interesting texts, (c) strategy instruction, (d) collaboration to construct knowledge socially, (e) providing praise and rewards, (f) using various methods of evaluation, and (g) teacher involvement and pedagogical knowledge have powerful effects on students' reading engagement and comprehension.

Empirical studies have documented the impact of classroom practices on reading outcomes and engagement. Many studies (e.g. Guthrie et al., 1999; Guthrie & Klauda, 2014) examined the impact of Concept-Oriented Reading Instruction (CORI) on learners' reading engagement and motivation as well as comprehension of information texts. In the EFL context, Vongkrachang and Chinwonno (2015) found that explicit reading instruction using the CORI framework has robust effects on EFL Thai undergraduate students' informational text comprehension and positive changes in behavioral, affective, and cognitive reading engagement. Despite the promise that reading engagement can help students achieve their learning potential, few empirical studies targeted ELLs (Barber et al., 2016). In the Egyptian context, Abdelhalim (2017) found that incorporating habits of mind with shared inquiry improved Saudi EFL learners' reading engagement and comprehension. Likely, Shehata (2019) found that differentiated instruction enhanced Egyptian EFL sixth-grade students' reading engagement and comprehension.

Providing a supportive and inducive learning environment that facilitates interaction and collaboration is crucial for attaining engaging, meaningful, and productive learning. Online learning environments offer unique opportunities for student engagement that aren't available in regular classroom settings. Mango (2015) proved that using iPads positively affected active learning and engagement with classroom activities of university students learning Arabic as a foreign language at a college in the Southwest of the US. In this vein, Kim and Kim (2020) found that designing a wiki-enhanced and blended writing course sustained university students' behavioral, affective, and cognitive engagement.

Flipped Reading Instruction Utilizing Scaffolding and Digital Badges

- ***Online Flipped Instruction***

One emerging instructional approach that has recently gained considerable concern in higher education as efficient in increasing student learning engagement and mindful learning is called the flipped classroom. Bergmann and Sams (2012) conceptualized flipped learning as an instructional framework that entails transforming teaching practices and restructuring time. The Flip Learning Network (2014) defines it as "a pedagogical learner-centered model in which direct instruction shifts from the group learning zone to the individual learning zone, and the group zone is shifted in a dynamic, interactive learning environment where the instructor reinforces learning as students apply and engage creatively in the content" (p. 1). Bergman and Sams (2012) assure that Flipped Learning (FL) is not only about providing direct instruction using video, but it is more about a mindset that entails transforming focus from the teacher to the learner. Accordingly, Lee (2022) expands the definition of FL as an instructional model that encompasses "learning foundational content independently before class using pre-class learning materials and then getting engaged in higher-order and interactive learning activities in class for collaborative in-depth knowledge application facilitated by teachers" (p. 4).

In the flipped classroom, students are involved in preparatory coursework virtually before participating in on-site learning activities with peers and instructors to enhance comprehension and integrate knowledge (Reidsema et al., 2017). According to the flipped learning paradigm, the knowledge transfer from assigned books, podcasts, or videos is fulfilled before class. Equipped with this knowledge, students come to class to practice applying their knowledge and fill in comprehension gaps through peer and instructor feedback to acquire and retain information at greater levels (Jeffries et al., 2022).

Many educators confirm that flipped instruction is highly connected to the cognitive social constructivist theories. El Miedany (2019) mentions that according to the constructivist model of inquiry-based learning cycle, teaching comprises two distinct phases: (a) *content attainment phase,* where students gain conceptual understanding; and (b) *concept application phase,* where students apply and evaluate those concepts in new contexts beyond that one in which they learned it. In a flipped model, as Mehring (2018) adds, knowledge is individually

and gradually constructed using the flipped learning materials, and then individuals are situated in an authentic, communicative learning environment enriched with constructivist activities that allow social interaction with diverse groups to strengthen and expand their understanding, examine ideas, apply new learning, discuss meaning, and cultivate critical thinking skills.

Flipped learning is an instructional model that entails inverting the delivery of instruction and application of course objectives by flipping the responsibilities of the teacher and the students, the time and location of learning, and the cognitive skills that are used during learning in a constructivist and dynamic learning environment that focuses on active learning and accordingly promoting deeper learning and engagement. Consistent with this perspective, Yeo (2018) explains that the flipped model allows students to learn within their Zone of Proximal Development (ZPD) and collaborate with more capable peers to clarify, check, and consolidate their learning. In this vein, researchers (i.e. Birgili et al., 2021; Mehring, 2018; Walker et al., 2020) assure that a well-structured flipped instruction entails helping learners get prepared by providing learners with content beforehand, encouraging collaborative learning and modeling in class as well as providing constant feedback which enables students to get involved in hands-on activities, correct misconceptions, construct their own knowledge, test their assumptions, conduct research, evaluate and reflect on their learning leading to higher cognitive performance.

Flipped learning is not limited to videos or any particular type of material delivery. Lee (2022) affirms that students could be provided with pre-class learning materials of different modalities such as prerecorded videos, textbook readings, PowerPoint presentations, homework problems, interactive simulations, animated readings, and intelligent tutoring systems. Additionally, Walker et al. (2020) listed various public tools with interactive features that educators can use to flip instruction delivery including platforms and sites for video hosting combined with forms of assessment (e.g. Brainpop, Edpuzzle, Flipgrid, Schooltube, Emaze, Screencast-O-Matic, and Skillshare) in addition to tools that allow creating and sharing learning materials (e.g. Educreations, Padlet, Pearltrees), as well as learning and teaching platforms that allow sharing diverse options of digital materials, assigning homework and quizzes, and have its social network features (e.g. Edmodo, GoClass, Google Classroom, Microsoft Teams, and Quizizz)

The efficiency of flipped instruction on student engagement and language learning has been documented in numerous research over the past ten years. Karimi and Hamzavi (2017) found that the flipped model had a significant positive effect on the reading comprehension ability of EFL students and the students recorded a positive attitude toward flipped instruction. In this vein, Phung and Yen (2020) found that Vietnamese high school students learning with the flipped model outperformed their peers taught with conventional instruction. Likely, Gok et al. (2021) found that integrating the flipped model into the "Advanced Reading and Writing" course for 34 Turkish pre-service EFL teachers reduced EFL learning and reading anxiety levels. Additionally, the research results of Al-Jaro et al. (2022) revealed Yemeni EFL university students' positive perceptions of offline flipped classrooms provided by sharing materials through flash drives or phone-sharing applications instead of sharing them via online platforms and its effectiveness in developing the students' writing skills. Mirzaei et al. (2022) proved the significant synergistic effects of the Attention, Relevance, Confidence, and Satisfaction (ARCS) model and flipped teaching utilizing Edmodo on developing Iranian EFL learners' expository-writing performance and motivation.

Due to the COVID-19 pandemic, flipped learning was adopted by universities and employed in the online environment. In the online flipped Learning (OFL) model, as Jiang et al. (2021) explain, "students get prepared by completing pre-class activities and then, unlike the conventional flipped model, students and teachers meet virtually through video conferencing or other tools" (p. 2). The fully online flipped learning, Lee (2022) argues, converts offline in-class learning into online in-class learning using synchronous virtual class tools. With the use of Zoom videoconferencing, Hew et al. (2020) effectively converted two traditional flipped pedagogical courses—"E-Learning Strategies" and "Engaging Adult Learners"—into fully online flipped classes. Results revealed that the participants in the fully online flipped classes outperformed those in the conventional flipped learning classes. However, Martin et al. (2023) expanded the practice of OFC to Bichronous Online Learning, which combines synchronous and asynchronous online learning.

Although online flipped learning is gaining popularity in education, particularly language instruction, a dearth of research has examined this model. One study focused on integrating the "Online to Offline" (O2O) with the four

stages of Experiential Learning Cycle (ELC) in Microeconomics courses demonstrating significant improvements in O2O students' learning outcomes (Zheng et al., 2018). A second study found that combining online flipped learning with problem-based models developed language editing skills of students enrolled in a "Language Editing Course" (Asteria et al., 2020). A third study revealed significant improvements in Indonesian university students' learning engagement due to integrating gamified formative assessments with synchronous online flipped instruction in the "Introduction to Public Administration" course (Zainuddin et al. (2021).

In the EFL context, Rahimi and Hasheminasab (2020) found that Iranian EFL learners who received online flipped instruction outperformed those who received offline flipped instruction regarding writing performance and attitudes. Korkmaz and Mirici (2021) found that synchronous online flipped learning model enhanced Turkish university students' speaking performance, but it was ineffective in decreasing students' foreign language anxiety or enhancing students' self-regulatory behaviors compared to the face-to-face synchronous teaching model.

However, educators and researchers found that learners encounter difficulties in keeping attention, staying connected to their peers and instructors, and maintaining their active engagement in online learning (e.g. Hollister et al., 2022; Means, & Neisler, 2020). Therefore, there is a need to apply effective teaching techniques and tools to improve student engagement in learning in this unfavorable learning environment. For these reasons, the present researcher involved students in e-scaffolding strategies and utilized digital badges to provide instructional conditions that foster learning engagement and improve reading performance.

- ***Online Scaffolding***

Drawing on Vygotsky's sociocultural theory, particularly the notion of the zone of proximal development (ZPD), Wood et al. (1976) coined the concept of scaffolding to describe the dynamic support given by more capable individuals to a novice learner in carrying out an activity beyond his/her unassisted level. Scaffolding is a direct application of ZPD which is conceptualized by Vygotsky (1978) as the distance between what a learner can do unaided and what s/he can

do under more skilled expert guidance or in coordination with more capable peers.

Effective scaffolding is not simply a synonym for help. Researchers (e.g. Belland, 2017; Gibbons, 2015; Hammond & Gibbons, 2005) confirmed that scaffolding differs from other forms of instructional support in the following distinct aspects: (a) scaffolding requires clearly articulated goals and learning activities; (b) it is a conditional temporary support provided for the learners till they gain the target skill and can function independently; (c) it is a timely support that occurs during learning in the ZPD not before performing a task; (d) scaffolding requires interaction with teacher, peers, or technology; (e) it simplifies tasks and highlights complexity therein as most learning takes place when the learning context provides both high challenge and high support; (f) scaffolding is an adaptive and responsive assist that is progressively adjusted to address the needs of different students. Consistent with this perspective, Ersani et al. (2021) state that scaffolding as supportive interaction is characterized by its *contingency* through giving the right amount and type of support based on students' needs, *intersubjectivity* by recognizing students' success at mastering a new task, and *transfer of responsibility* by gradually removing support when students become able to do a particular task without assistance.

Walqui (2006) outlines six main types of scaffolding instruction: (a) *modeling* by giving clear examples of the targeted performance for imitation; (b) *bridging* by activating students' prior knowledge and connecting the new learning to their life; (c) *contextualizing* by using nonlinguistic representations, manipulatives, authentic materials, and drawing analogies; (d) *schema building* by presenting clusters of interconnected meaning to relate the new information with their pre-existing structures of meaning; (e) *re-presenting text* through transforming text from one genre to another (e.g. transforming scientific texts into reports, letters, or posters) or by asking students to make future predictions; and (f) *developing metacognition* through consciously and strategically applying learned strategies in addition to monitoring, evaluating, and adjusting performance.

Scaffolding can be provided by a variety of different techniques or mechanisms. Hannafin et al. (1999) classified the scaffolding process into four types of functions that are served through various mechanisms as follows: (a) *conceptual scaffolding* which assists learners in constructing concepts about what

they learn by providing explicit hints and organizers or content maps; (b) *metacognitive scaffolding* which manages thinking during learning by modeling cognitive strategies and helping learners plan ahead and evaluate their progress; (c) *procedural scaffolding* which supports how to use resources and instruments during the learning by providing "pop-up" help to explain features; and (d) *strategic scaffolding* which emphasizes analysis and approaching learning with alternative strategies and resources, providing start-up questions, and providing advice from experts.

However, Echevarria et al. (2010) state that English learners need diverse types of scaffolding including (a) *verbal scaffolding* that is provided through using prompts, questioning, elaboration, paraphrasing, thinking-aloud, contextualizing definitions, modeling accurate pronunciation by recasting students' responses, and slowing speech to allow students process information in English; (b) *procedural scaffolding* that is provided through using instructional framework that includes direct instruction processes, one-on-one teaching or coaching, small group instruction, partnering or grouping more experienced students to help those with less experience; and (c) *instructional scaffolding* which comprises using graphic organizers as a pre-learning tool or to illustrate the structure of the content.

Consistent with this perspective, Mackiewicz and Thompson (2014) categorized scaffolding into three types: (a) *instructional scaffolding* which includes telling, suggesting, and explaining with examples; (b) *cognitive scaffolding* which comprises asking questions, reading aloud, responding as a reader, activating prior knowledge, giving hints, and demonstrating; and (c) *motivational scaffolding* which encompasses showing care, providing empathy and sympathy, praising, using humor, and reinforcing students' ownership and control.

Scaffolding is more required in web-based learning environments, where students usually lack support from others (e.g., instructors and peers) and feel isolated. Providing scaffolding is essential in web-based courses to sustain students' motivation and overcome obstacles, which will in turn help students fulfill their learning objectives. Sharma and Hannafin, (2007) presented scaffolding in Technology-Enhanced Learning Environments (TELE) as "providing technology-mediated support to learners as they perform a specific task" (p. 29). Instructors could scaffold students interaction and learning in a

constructivist web-based environment by announcing course expectations, prompting students to express concerns or problems, monitoring collaborations, and developing diverse online tasks that engage students in collaborating with others, participating in online discussions, posing or answering a question, asking for or providing help, or providing or getting feedback (Cho, M. & Cho, Y., 2014; Cho, & Kim, 2013). Furthermore, Luzón (2006) adds that effective ELL in online environments requires instructors to provide learners with appropriate support to use online resources and engage in tasks by (a) helping learners plan their learning and manage the materials; (b) designing meaningful language tasks; and (c) employing peer-assessment, self-assessment, and self-reflection tools.

Scaffolding has been reported as one of the most effective instructional practices with different targets, learning outcomes, participants, and learning contexts. Several studies have confirmed the positive effects of scaffolding in enhancing reading engagement (Lutz et al., 2006), reading skills (Al Eissa, & Al-Barghi, 2017), writing skills (Gholami Pasand, & Tahriri, 2017), listening comprehension (Ahmadi Safa, & Rozati, 2017), speaking complexity, accuracy, and fluency (Ghasedi et al., 2018). Additionally, research on scaffolding in TEFL has demonstrated that scaffolding enhances students' self-regulation for online interaction with others (Cho, & Kim, 2013), academic engagement (Cho, M. & Cho, Y., 2014), task orientation (Ak, 2016), learning achievement, metacognition, and academic self-efficacy (Valencia-Vallejo et al., 2019), EFL autonomous learning (Chen, 2020), and EFL reading comprehension (Aslan et al., 2022).

- ***Digital Badges***

While instructors are struggling to sustain student focus on the complex nature of the reading process, particularly in online learning environments, Digital Badges (DBs) emerged as a web-based tool that is rapidly evolving within higher education settings and proved effective in increasing students' motivation, involvement, and performance. Delello et al. (2018) and Gibson et al. (2015) highlight that according to Google Trends, the worldwide interest in the term "digital badges" remained unexploited till 2011 when MacArthur Foundation with Mozilla launched the "Digital Media and Learning Competition" for designing and assessing digital badges. O'Byrne et al. (2015) define DBs as web-enabled "visual representations of learner accomplishments that include specific claims about learning with detailed supporting evidence" (p. 451). Moreover,

Askeroth and Newby (2020) define DB as "a web-based visual image that demonstrates a skill obtained by a learner upon fulfilling a series of tasks or requirements specified by the issuer" (p. 1). Gibson et al. (2015) conceptualized DBs as "a visual online representation of an achievement and contains metadata with links that illustrate the context, process, and result of an activity" (403). Accordingly, DBs, as O'Byrne et al. (2015) explain, usually include a graphic and related metadata (e.g., badge name, description, criteria, issuer, evidence, and date issued). For designing DBs, Hensiek et al. (2016) point out, instructors could use a variety of digital badging software such as Badgr, Badge List, Canvabadges, Passport app29, ForAllRubrics, or Peer 2 Peer University (P2PU).

Askeroth and Newby (2020) agree with Gibson et al. (2015) that digital badges, as a recent innovative educational tool, have a variety of unique characteristics that serve different functions as a learning or achievement reward including (a) gamifying learning allowing learners to compete with themselves or others, (b) identifying learning growth, (c) signifying engagement and achievement, (d) offering an alternative way to assess learning, (e) motivating learners as they share badges with peers on social networks, and (f) incentivizing learners to participate in constructive learning practices.

While utilizing digital badges in educational contexts is increasingly growing, there is little empirical evidence of the efficacy of employing digital badges in education, particularly within higher education settings. Hensiek et al. (2016) found that digital badging is an effective tool for evaluating the hands-on laboratory skills of Purdue University students studying the general chemistry course in the Colleges of Health and Human Sciences, Agriculture, Science, and Engineering. Likely, Dowling-Hetherington and Glowatz (2017) found that utilizing digital badges in a Business course helped Irish university students organize their study, maintain and track their progress, and motivate them to engage with module content throughout the semester. Further evidence is demonstrated by Uanhoro and Young (2022) who found that incorporating digital badges within Moodle had significant effects on Taiwanese university students' commitment to a general physics course and submitting assignments earlier than other students (not having digital badges).

In the context of English language education, Reid et al. (2015) found that incorporating digital badges as an assessment model accounted for 25 % of the overall grade in composition courses benefits learners who have high

expectations for learning and place value on learning tasks. Collins (2018) found that digital badges positively impacted reading growth and increased motivation with reading activities of second-grade students in a rural public elementary school in the southeastern United States. The results revealed that the students who earned digital badges (experiential group) for reading outperformed the students who did not earn badges (control group). Further evidence can be found in the study of Homer et al. (2018) that examined a gamified classroom experience of elementary school ESL students by implementing digital badges and points, via ClassDojo, that students could earn by achieving specific behavioral and learning goals. The results showed that the experimental group classes that used digital badges and points afforded by ClassDojo significantly outperformed the control group classes that employed a non-digital conventional system. Students' surveyed perceptions reflected enjoying using digital badges-and-points in the classrooms and teacher observational data indicated that the experimental group displayed more positive and on-task behaviors than the non-digital classroom system.

This review of the literature and related studies suggests the following conclusions: (a) relatively few studies have attempted to foster deep reading comprehension and reading engagement of EFL university students experimentally or to examine the role of digital badges and e-scaffolding in flipped reading interventions that improve reading performance; and (b) though digital badges are being adopted widely in educational settings as an alternative assessment model, research on their impact on engagement, particularly in ELL, is scarce.

Hypotheses of the study

1. There is a statistically significant difference between the participants' mean scores on the pre-post administrations of the deep reading comprehension test.
2. There is a statistically significant difference between the participants' mean scores on the pre-post administrations of the reading engagement questionnaire.

Methods

Design

This study utilized Mixed-Methods Research (MMR) with a quasi-experimental single-group pretest-posttest design. MMR combines both quantitative and qualitative data collection and analysis for data triangulation. The use of mixed methods, as Sendall et al (2018) affirm, broadens perspectives beyond the scope of any single research methodology and allows more discussion and reflection. The data from the interview was used to triangulate with other data sources collected including the reading engagement questionnaire and the deep reading comprehension test.

Participants

The main sample of the study consisted of sixty-eight EFL students enrolled in the first year at the English department, the Faculty of Education, Port Said University. The participants of the study comprised (32) General and (36) Elementary education freshmen, aged between 18 and 19.

Data Collection

The researcher used various sources in this study to gather data on each of the two dependent variables, deep reading and reading engagement.

1. ***Deep reading comprehension test.***

The Test was constructed to assess the ability to comprehend expository texts before and after the treatment to compare changes in reading comprehension. The test consisted of three 300-520-word passages. Each expository text was followed by twelve to fifteen multiple-choice items and two open-ended questions for a total of forty-eight items. The questions assess the students' abilities to recognize the main idea, specify supporting ideas, make inferences, determine the author's stance or purpose, distinguish claims and evidence, analyze text structure, represent the text visually using an appropriate organizer/an outlining tool, draw conclusions, evaluate ideas by detecting inconsistencies, integrate ideas, expand the text, use appropriate summarizing strategy correctly, and. Three 4-point rating scales were prepared for scoring the open-ended questions (i.e. drawing graphic organizer, outlining, writing a

summary). The content of the test was validated and pilot-tested to ensure its reliability coefficient (= 0.73).

2. Student-reported reading engagement

To assess the degree to which EFL students are involved in the process of reading, affective, behavioral, and cognitive engagement were measured using a 15-item questionnaire with a 7-point Likert-type scale adapted from well-validated questionnaires developed by Reeve and Tseng (2011) and Lam et al. (2014) that have been tested in several studies (e.g., Zainuddin et al., 2021; Mameli, & Passini, 2018; Reeve, 2013). Students specified their level of agreement on a 7-point Likert-type scale (from 1 = completely disagree to 7 = completely agree). High scores indicate high levels of engagement.

3. Focused group interview

To learn more about students' engagement in this flipped English reading course supported with scaffolding and digital badges, focused group interviews were conducted on two different occasions and ten students volunteered to take part in them. The entry interview was conducted after the second week of the term and before the treatment and it encompassed four questions exploring their perceptions about reading tasks and this reading course. These students were invited to do the exit interview within one week of the end of the treatment using a structured interview guide containing additional questions that focused on students' reactions to the flipped reading course, the provided scaffolding; and using digital badges. Data from the interviews were analyzed qualitatively and interpreted according to the main interview questions.

Description of the Treatment

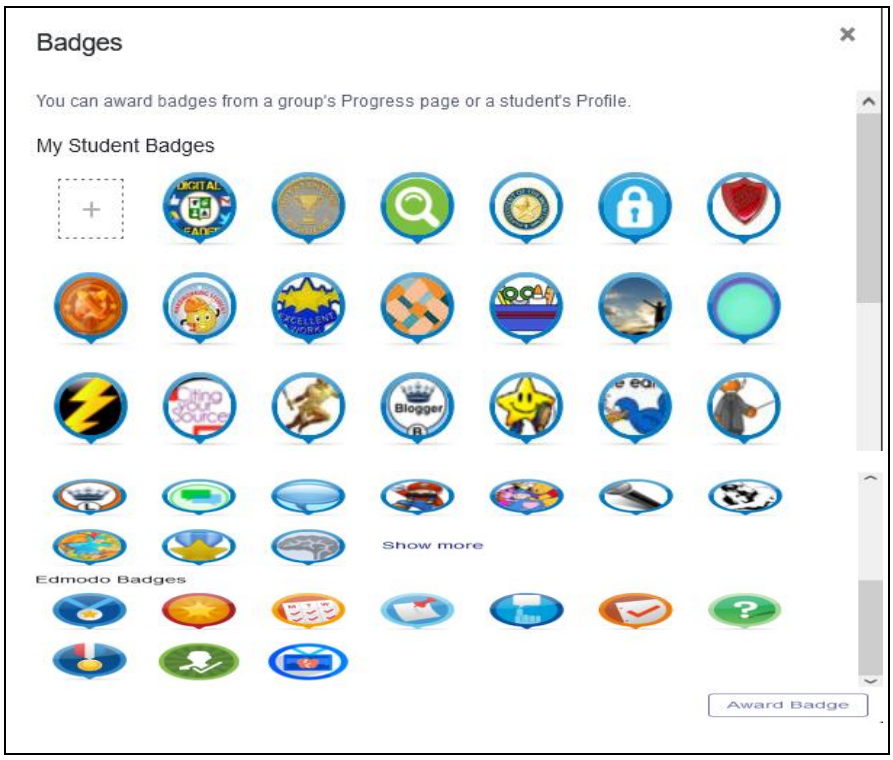
This treatment was conducted as part of the 2-credit undergraduate course entitled "English Reading 1" in the spring semester of 2020/2021 at the Faculty of Education, Port Said University. This 6-session treatment adopted an online flipped learning design. Prior to implementing the flipped classroom approach, five face-to-face sessions were provided to introduce the course outline, provide an overview of the reading processes and strategies, apply some selected strategies to four reading texts, explain how the class will be flipped, introduce Edmodo and Google Classroom, discuss different types of reading texts, and present different reading strategies to be applied through this online flipped

course. The students were provided with the related reading texts, selected YouTube videos, and learning materials (handouts and worksheets). The instructor planned and designed specific tasks to be done, scaffolding materials to be used, and digital badges for online flipped class sessions. During online teaching, students logged into Edmodo to follow the discussion sessions. The students posted questions or answers on the topic and typed comments for the teacher or other students. Specific tasks and assignments were prepared for students to be performed supported with a variety of scaffolding strategies. During the offline time, the students watched videos of some selected reading strategies, read posted texts on the topic, and finished vocabulary tasks via Google Classroom or Edmodo.

The online flipped learning approach (OFLA) was applied following three phases: (1) pre-class activities (including watching uploaded videos about reading strategies to apply them during reading via Edmodo, introducing vocabulary through activities via Google Classroom or Edmodo, reading selected texts, considering comprehension questions, and taking notes); (2) in-class activities (including answering comprehension questions, posing questions, consider challenging questions and deepening their understanding, and giving feedback); and (3) post-class activities (including summarizing, drawing organizers, outlining, and reflecting on reading). This OFLA utilized Edmodo and Google Classroom as they afford a free and safe online learning environment. However, after two sessions the students preferred to focus on using one application and they selected Edmodo as this educational social networking platform is easier to use and similar to other social networks that they are familiar with such as Facebook. Edmodo is favored by the students in this study as they can connect with each other and with the instructor personally by sending messages and chatting as well as participating collectively in discussion boards. Edmodo, as elucidated by Mirzaei et al. (2022), provides a free text-based a/synchronous learning platform with social networking features that allow teachers to share course materials (e.g. documents, pictures, videos, multimedia, hyperlinks, and polls), post homework or quizzes, and schedule submission, feedback, or evaluation electronically. Additionally, the researcher used a free badge builder, the Badge Designer (https://badge.design/), which makes it easy to create beautiful open badges that satisfy the objectives of the experiment as the badges available via Edmodo are too few. Figure 1 shows the digital badges used in this treatment, either developed by the researcher or Edmodo badges.

Figure 1

Digital badges used by the researcher via Edmodo



During this OFLA-based treatment, the instructor provided diverse reading activities to foster deep processing of reading texts. The pre-class activities engaged students in previewing texts before reading, making predictions, activating relevant background knowledge, and defining unfamiliar words. The in-class activities engaged students in responding to questions with relevant comments, determining the important ideas, discussing other's opinions, using text structure to support comprehension, and monitoring their comprehension during reading. The students not only need to process the text to answer the questions but also specify the relevant sections and relate the information from those sections, for example, through inferences. The post-class activities engaged students in creating visual representations (e.g. concept maps, thinking maps, mind maps, and outlining organizers), summarizing what they read, considering challenging questions, generating questions for text, and extending their understanding through making connections. After online discussions, students presented their conclusions as a written/visual summary or a reflection in order to improve their skills of summarizing and reflecting on reading as well as to scaffold students who did not manage to attend on time or follow the discussion because of problems with connections. Also, the instructor wrapped up the session by introducing the next reading strategy and text.

Figure 2

Samples of students celebrating earned digital badges via Edmodo

This OFLA-based treatment incorporated digital badges to motivate and engage students with reading tasks in a manner that is both stimulating and reflective. The digital badges provided the students with opportunities to celebrate their achievements and reflect on their performance. In addition to the Edmodo badges, the Badge Designer tool (https://badge.design/) was used to create special open digital badges that motivate students to participate actively in online class discussions, be attentive and answer questions without waiting for others' answers, submit assignments early, think deeply, share unique ideas and interpretations of texts, and keep committed to this reading course. Figure 2

shows samples of badges that students share in achievement celebration posts via Edmodo.

Additionally, this OFLA-based treatment incorporated some crucial aspects of instructional scaffolding with the support provided by the instructor, peers, or technology to promote the students' performance and engagement such as (a) pre-engaging the students with the videos and introducing vocabulary, and directing students to read the selected texts before coming to online discussion to be prepared for the in-class activities; (b) sharing goals for reading selected texts and specifications of assignments; (c) identifying the learners' demands and difficulties to clarify specific aspects; (d) providing appropriate support through giving clear instructions, modeling, providing hints, supportive learning materials, visuals, engaging them in interactive discussion, probing graded questions, and allowing appropriate wait-time; (e) providing feedback either illustrative and constructive feedback to help students overcome any challenges, or evaluative feedback to reinforce learning and achievement through digital badges; and (f) consolidating and expanding learning by reflecting on learning and making connections to other passages and to the real life.

Results and Discussion

Quantitative results

The results of analyzing quantitative data of the study collected by the deep reading comprehension test and the student reading engagement questionnaire will be presented in terms of the study questions and hypotheses as follows:

The first research question was answered in the light of the results of testing the first hypothesis by calculating t-test for paired samples of the participants' mean scores on the pre-post administrations of the deep reading comprehension test. The results of the t-test showed that there is a significantly large difference between deep reading comprehension pre-assessment (*M = 30.6, SD = 7.9*) and deep reading comprehension post-assessment (*M = 49.6, SD = 6.8*), *t* (67) = 32.6, *the value of p is < .00001,* accordingly the result is significant at *p < .05,* proving the first hypothesis. Table (1) shows this statistical significance. Also, the effect size of that difference, using Cohen's D formula for paired samples t-test yielded a large effect size (d= 3.95, d>0.8).

Table 1

T-Test values of deep reading comprehension pre-post test

Deep Reading Comprehension Pre-Assessment		Deep Reading Comprehension Post-Assessment		T-test			In favor of
M.	S.D.	M.	S.D.	T-value	DF	Sig.	
30.6	7.9	49.6	6.8	32.6	67	.05	post

It is apparent from the data presented in Table (1) that there is a statistically significant difference between the means of the total scores of the subjects in the pre-test and their total scores in the post-test, in favor of the latter. The obtained t-value is 32.6, a highly significant value at the level of .05, indicating the significant effect of the flipped reading instruction utilizing e-scaffolding and digital badges on the students' deep reading comprehension. Consequently, the first hypothesis of the study is verified and this confirms the positive impact of the treatment on enhancing the students' deep reading.

The second research question was answered in the light of the results of testing the second hypothesis by calculating t-test for paired samples of the participants' mean scores on the pre-post administrations of the reading engagement questionnaire. The results of the t-test showed that there is a significantly large difference between reading engagement pre-assessment (M = 57.9, SD = 6.2) and reading engagement post-assessment (M = 87, SD = 5.6), t (67) = 26.9, the value of p *is* < *.00001,* accordingly the result is significant at p < *.05,* proving the second hypothesis. Table (2) shows this statistical significance. Also, the effect size of that difference, using Cohen's D formula for paired samples t-test yielded a large effect size (d= 3.21, d>0.8).

Table 2

T-Test values of reading engagement pre-post assessment

Reading Engagement Pre-Assessment		Reading Engagement Post-Assessment		T-test			In favor of
M.	S.D.	M.	S.D.	T-value	DF	Sig.	
57.9	6.2	87	5.6	26.869	67	.05	Post

Results shown in table (2) indicate that there is a statistically significant difference between the mean scores of the students on the pre-post reading engagement questionnaire, in favor of the post-assessment. The obtained t-value is 26.869, a highly significant value at the level of .05, indicating the significant

effect of the flipped reading instruction utilizing e-scaffolding and digital badges on the students' reading engagement. Consequently, the second hypothesis of the study is verified and this confirms the positive impact of the treatment on enhancing the students' reading engagement.

Qualitative results of the interviews

The responses of the students in the entry interview were very brief and similar to a great extent reflecting their limited view about reading courses and tasks. When they were asked about their favorite reading activities, they mentioned comprehension questions either multiple-choice or open-ended. There was a kind of agreement that they do not plan before reading tasks and that they intend to finish reading tasks on time as much as they can. Their responses give a sense of disengagement reflecting that they tend to take the course less seriously as they think that they study more difficult and challenging academic subjects that require more than answering questions after reading some passages.

As for the exit interview, it included the same four questions in the entry interview to find out the change in the participants' responses and four additional questions to shed light on the participants' views about the flipped reading course, the provided scaffolding, and the use of digital badges. Analysis of the exit interview revealed that students' perceptions and behaviors changed across the intervention. When they were asked about their favorite reading activities, they mentioned "*drawing organizers, especially thinking maps*", "*summarizing using new different techniques*", and "*searching for evidence in the passage to support answers*". Their responses reflected a kind of increased engagement as they mentioned preparing for reading tasks by "*watching videos*", "*reading passages carefully*", and "checking task instructions". When they were asked if they finish reading tasks punctually, there was a kind of agreement that they finish the tasks "*directly after the session*" on the same day of the session or "*within a week*" at most before the next session.

When they were asked about their opinions of this online flipped reading course utilizing Edmodo and what they liked, students liked the accessibility of the platform and the learning materials, time flexibility by having the potential to work at their own pace, learning different strategies, and positivity and availability of the instructor to answer questions during the out-of-class time. One student noted, "*I liked that reading passages and videos were shared a week*

before the session and we had enough time to read and take notes". Another student stated, "*I liked that the lecturer is available to answer my questions and that I can send private messages to ask about assignments".* The interviewees also expressed positive views about using Edmodo and communicating via writing, compared to other courses that require synchronous attendance via video conferencing platforms such as Microsoft Teams or Zoom. As a safe and free-risk learning environment, for example, one student noted, "*Using Edmodo was good for me as I can join the online discussion easily without permission and without getting embarrassed about surrounding noise at my house or any other places".* Students were also asked to compare their performance before and after flipping the reading course. They reported improvements in vocabulary knowledge and reading comprehension with strategy use. One student said, *"At the beginning, I used to check the dictionary when I faced a new word. Now, learned to read the passages and get the meaning of unknown words using different techniques".* Another student mentioned, *"I did make great improvements, learned techniques to know the meaning of new words and summarizing".* A third student reported, *"It was useful for me, my reading level improved by viewing videos and doing tasks".*

The students reported several strengths of the online flipped instruction. For instance, one student noted, *"I felt comfortable expressing my ideas in writing not orally".* Another student stated*: "I did not worry about making English mistakes as I can check my comment before posting it."* Some further positive responses are as follows: *"What I liked more about this course was accessing the platform easily from my mobile and downloading videos and materials before the meeting to be ready"; "I learned new strategies"; "I like the badges as they motivate me to keep working"; "The lecturer encouraged us to support the answers with evidence from the passages";* and *"The lecturer encouraged us to summarize what we learned"*. However, some students showed negative attitudes toward flipping the reading course utilizing Edmodo. Some sample negative remarks included: *"It was not working for me, the online written discussion is time-consuming and I get bored and distracted. I can't keep my concentration"; "It is not practical to follow the written discussion and the others' comments"; "Reading from the screen of a mobile phone is difficult for me, so I downloaded and printed texts to read them carefully because I like highlighting and taking some notes on paper"; "I felt disconnected without seeing and hearing the voice of the lecturer and my colleagues during the online class".*

Concerning the provided scaffolding, the responses to the questions about the kind of scaffolding (or support) they received to facilitate their learning in this flipped course and its usefulness, some participants reported positive experiences with different forms of scaffolding revealing different themes as follows:

- Providing simple tips to organize the online discussion: one student noted, *"The lecturer wrote each question as a comment on the post of discussing the passage and asked us to write the answers as a reply to her comment to make the discussion more organized"*
- Recommending specific strategies for understanding: one student stated, "*The lecturer guided us to use reading strategies such as fix-up strategies to guess the meaning of unknown words and summarizing strategies*"
- Prompting students to participate and share ideas: one student mentioned, "*The lecturer encouraged us to share ideas, opinions, and even the answers to tasks. I learned a lot from the answers of my colleagues*". Another student reported, "*The instructor required us to provide evidence from the passage with the sentence and paragraph numbers and this helped me to learn from other students' answers how to think".*
- Encouraging students to summarize discussion and opinions: one student mentioned, *"The most thing I liked was that at the end of each session, the lecturer asked some of us to summarize all answers with supporting evidence for special badges. This made me feel relieved to check my answers or anything I missed".* Another student reported, *"I liked the task that required us to mention three main points, one idea I disagree with, and one question I still do not know its answer; it made us think more and learn interesting ideas from each other".*
- Showing relationships between concepts: one student noted, *"I enjoyed connecting two passages such as "The Population Explosion plus Why So Many Children and Cutting down the Forests plus From Farmland to Desert as well as The Green Revolution plus Farming for the Future".*
- Providing clear instructions for assignments: one student noted, "*The most thing that helped me is the clear steps of tasks and assignments. The lecturer explained what is required and what is not required*".
- Presenting cognitive challenge: one student stated, *"I enjoyed that we start with easy questions that we prepared their answers with evidence before class then ending with new interesting and more complicated tasks with special badges"*

- Obtaining positive and supportive feedback: one student noted, "*I like that when we give different answers for a question, the instructor gives us the correct answer and tells us why it is the best answer and why the other answers are not correct*". Another student mentioned, *"The lecturer read all our answers, corrected mistakes or gave a hint, gave a like, and sometimes finds out students who copied others' answers".* A third student reported, *"I liked when the lecturer named me with other colleagues as the superstars of the session at the end".*

Concerning using digital badges, the responses to the questions about the digital badges they received in this course and its benefits revealed that most students viewed digital badges favorably, one student commented, "*Digital badges made me participate actively in reading tasks on Edmodo*". Another student stated, "*They were helpful to make sure that I am doing the tasks correctly*". A third student noted, "*Digital badges helped me track my progress and keep working*". Some further positive responses are as follows: "*I take tasks with special digital badges more seriously than other tasks*"; "*I told my parents and colleagues about the badges I earned in this reading course*"; "*Every week, I checked my account to find if I got more new badges"; "I was motivated me to get more badges than other students, particularly the special badges of challenging tasks"; "At first I was disappointed because I received a simple badge, but then I felt motivated to finish assignments and get more special badges in the next tasks".* Another different interesting viewpoint highlighted negative attitudes towards digital badges. One student commented, "*I was disappointed because I did not receive special badges as other students*". Another student noted, *"The rules of getting either ordinary or special digital badges were not clear enough for me".*

Discussion

Regarding the first research question, the results indicate that flipped instruction enhanced with e-scaffolding and digital badges proved to be effective in fostering deep reading comprehension of EFL university students. This progress might be attributed to creating a scaffolded and conducive learning online context that allows learners to log on asynchronously, get pre-engaged with reading strategies videos, download learning materials, get related vocabulary introduced with activities before reading and online discussion, ask and answer questions, and submit tasks. The interviewed students also expressed

positive views about the instructor, particularly encouraging students to practice different reading strategies, providing clear instructions for the reading tasks, providing hints and clues to help students find the best answers, asking deep questions, providing explicit modeling by asking high-ability students to serve as a strategy use model, encouraging students to elaborate and add explanation or direct evidence from the text, prompting students to connect the texts with their prior knowledge and experience, and sharing individual and collective feedback. This positive result supports the findings of other studies like those of Karimi and Hamzavi (2017) and Phung and Yen, (2020) who asserted the significant positive effect of flipped instruction on the reading comprehension of EFL learners. Additionally, this finding is consistent with Jufri (2019) who reported the links between providing scaffolded instruction and improved reading performance of EFL learners.

Regarding the second research question, the results reveal the positive impact of incorporating scaffolding and digital badges into online flipped reading instruction on enhancing reading engagement of EFL university students. This advance might be attributed to creating an engaging and supportive online learning environment that gets students affectively, cognitively, and behaviorally involved in interesting reading activities and challenging tasks. The interviewees also demonstrated positive views about the learning experience adopted in this study particularly providing different opportunities to interact with the content, other learners, and the instructor as well as providing the motivating digital badges. This finding is supported by Wigfield et al. (2008) and Guthrie et al. (2012) who have asserted the links between reading engagement and specific instructional practices, which were employed in this study, including supporting autonomy, choosing interesting texts, implementing strategy instruction, constructing knowledge collaboratively, offering praise and rewards, and utilizing a variety of assessment techniques. Also, this finding is corroborated with that of Kim and Kim's study (2020) which found that engaging learners in an online learning community to share ideas and deploy various cognitive skills and strategies build positive beliefs about their performance and favorable feelings toward learning tasks. Additionally, the results support the findings of other studies like those of Reid et al. (2015) and Dowling-Hetherington and Glowatz (2017) who proved that using digital badges is highly connected with engaging learners and attaining an enhanced learning experience.

The findings of this study should be considered in the light of some limitations including characteristics of the sample, data collection, and other aspects related to the treatment. These limitations are presented as follows:

- A sample of 68 first-year students at the English section, the Faculty of Education, Port Said University participated as an experimental group. It was not possible to divide them into an experimental and a control group due to COVID-19. Replicating this study with a larger sample and a control group could provide more diverse results.

- Using Edmodo and Google Classroom to provide a flipped reading instruction. Incorporating video conferencing tools such as Zoom and Microsoft Teams might lead to interesting results concerning students' engagement.

- Using some selected scaffolding techniques. This study utilized a variety of scaffolding techniques (explicit modeling, providing simple tips to organize the online discussion, providing clear instructions for assignments, prompting students to participate and share ideas, clarifying misconceptions, showing relationships between concepts, presenting cognitive challenge, encouraging students to summarize discussion and opinions, recommending specific strategies for understanding, providing criteria for doing tasks, providing positive and supportive feedback). However, replicating this study with a more digital dynamic scaffolding might enrich the treatment.

Implications for Practice and Future Research

The findings of this study contribute to online EFL education literature and provide practical implications for enhancing EFL students' language skills and maximizing engagement. This study provides various suggestions that can be utilized in the design and delivery of EFL online learning courses to foster a deeper learning experience and a higher level of student engagement. Based on the findings of this study, the following recommendations seem pertinent:

- Utilizing technology-based scaffolding techniques to reinforce EFL students' online learning such as engaging learners in peer and group online discussions.
- Providing authentic learning resources and meaningful tasks that students can actively relate to their own experiences.
- Digital badges can be used as a motivating tool to enhance students' online learning engagement and performance.

- EFL teachers should foster deeper learning by encouraging learners to think critically and reflectively, connect information from different sources, create new interpretations from available information, elaborate on ideas, and interact with texts.
- Fully online flipped learning can be enhanced by utilizing video conferencing tools (e.g. Zoom, Microsoft Teams, Webex Meetings, or Skype)

Additionally, based on the analysis of data and the results of the present study, the researcher offers some suggestions for further research as listed below:

- Further research could investigate the effect of incorporating other Web 2.0 tools (e.g., ClassDojo, Edredo, Moodle, Quizlet, Kahoot, Canavas, Blogs, Vlogs, WebQuests, Wikis, Padlet, Socrative, etc.) and other instructional techniques (e.g., reflective strategies, formative assessment, or gamification) into flipped instruction to enhance EFL learning.
- Furthermore, it would be useful to examine the efficiency of flipped instruction on the different reading skills (e.g. analytical, critical, or creative) with students of different levels of language proficiency.
- In addition, it would be interesting to study the impact of flipped instruction on other English language skills and elements such as oral or viewing comprehension, oral production, academic vocabulary, and grammar.
- This study should be replicated with some additional measures such as an evaluation of students' engagement through close analysis of video-based observation and learning analytics tools in online learning contexts.
- In addition, future research should include some case studies to explore online reading behaviors of students and follow reading gains so that a more comprehensive view can be revealed.
- Furthermore, it would be useful to study how EFL students conceptualize different types of scaffolding in online settings.
- Another direction for research would be to adapt other models of online learning such as hybrid learning, hyflex learning, and adaptive learning.
- Further research is needed to explore the effectiveness of incorporating digital badges in diverse online learning models on fostering self-directed, learning enjoyment, learning agency, resilience, or self-regulated learning.

Conclusion

The present study examined the effects of adopting an online flipped learning approach (OFLA) supported with scaffolding and digital badges on EFL university students' deep reading comprehension and reading engagement. The findings of this study support and extend existing flipped reading instruction research. This study reveals that these university readers actively participated in the meaning-making process as they interacted online with the text, with each other, and with the instructor. The overall results of the semi-structured focus-group interview revealed that the participants demonstrated a positive learning experience with OFLA enhanced with scaffolding and digital badges as positive outlets for interactive and deeper engagement with an informative reading process. In sum, the results appear to reveal that utilizing e-scaffolding and digital badges provided the students with the opportunity to practice and improve their deep reading skills and reinforced students' engagement.

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